

Mission of ICFRE (Indian Council of Forestry Research & Education)

"To generate, Preserve, disseminate and advance knowledge, technologies and solutions for addressing the issues related to forests and promote linkages arising out of interactions between people, forests and environment on a sustained basis through research, education and extension."

XIth Research Policy Committee (RPC) Meeting 2010





Indian Council of Forestry Research & Education

(An Autonomous Body of

the Ministry of Environment & Forests, Govt. of India)

P.O. New Forest

Dehradun – 248 006

Preface

Research Policy Committee (RPC) is the apex body at the Indian Council of Forestry Research and Education, Dehradun that prioritize the ICFRE funded research projects of eight research institutes and four research centers of ICFRE, located in different geographical area of the country.

ICFRE's Research Planning Process is a bottom up, transparent and participatory approach documented in the "**Methodology for Setting Research Priorities for ICFRE**" by equitable participation of all groups of research end users, researchers and research managers, envisaged through stakeholders meet, Research Advisory Group (RAG) at regional level and RPC at national level. RAG at each institute level is advisory in nature and new research proposals are prioritized by "weighted criteria method". Each Project is given an index score by the RAG members at each institute and average index score is calculated. RPC gives final approval to the research project balancing the regional and national perspectives.

Research Policy committee ensures balance among international, national, regional and state research requirements and decide investment in high quality forestry research. RPC has composite composition of research managers, research users and researchers. RPC meets once in a year preferably in February so that new research projects may start from April every year. RPC ensures management of resources base; promote effective coordination among various institutes of ICFRE, establishing synergic alliance with other agencies engaged in forestry research, etc.

XI RPC Meeting from 22nd to 24th February, 2010 is being convened by the Member Secretary of RPC, Shri Sandeep Tripathi DDG (Research) under the chairmanship of Dr G.S Rawat, Director General ICFRE. Research Planning Division is thankful to DG ICFRE and DDG (Research) for their continuous endeavors and encouragements to advance the forestry research projects of ICFRE commensurate with the needs of national forestry objectives as well as the needs of the research end-users involving various stakeholders in ICFRE funded research projects finalization.

Thanks are due to Directors and Group Coordinators of respective ICFRE Institutes for bringing in the various multi-stakeholders and forestry experts for effectively conducting the stakeholders meet, arranging the subject referees comments and RAG Proceedings for new research project proposals. We are thankful to the various multi-stakeholders and forestry experts who have commendably contributed their valuable suggestions on these research project preparations. We appreciate the efforts of all of the various researchers of the council who have toiled hard to prepare these research projects for RPC 2010 dealing with variety of emerging forestry research problems.

I would like to thank Dr. Sushma Mahajan, Scientist E, for her significant support in the efforts of Research Planning division ICFRE towards efficient conduct of Stakeholders meet / RAGs / RPC and bring qualitative improvements in the research project prioritization system of ICFRE.

I appreciate the typing and compilation efforts on this document made by Mrs. Manjeet Sharma PS, Shri Pankaj Thapa Sh. Yogesh Gairola, RA and Ms Amita Pant, RA and Ms Ruchi Koranga Computer operator working in Directorate of Research ICFRE. Last but not the least, I thank to everyone who has contributed in preparation of this document.

(Ashish Rawat) ADG (Research Panning Division) Directorate of Research, ICFRE.

		INDEX						
Name of the Institute	No. of New Research Project Proposed	Budget (In Lakh)		N requiremen	/Ian powe t under p	er blan proje	ct	Page Number
			JRF	FA/TA/P A/RA	SRF	Con	DEO	
								-
IFGTB, Coimbatore	36	572.825	31	25				1-49
AFRI, Jodhpur	· 11	314.286	12	8	1			50-61
HFRI, Shimla	4	107.810	5	4				62-68
TFRI, Jabalpur	18	161.590	12	5				69-82
IWST, Bangalore	14	157.745	5	9				83-95
RFRI, Jorhat	10	128.956	6	8				96-104
IFP, Ranchi	. 11	377.840	7	5	1			105-130
FRI, Dehradun	65	761.218	37	34	2	1	4	131-192
Total	169	2582.27	115	98	4	1	4	
JRF : Junior Research Fellow								
SRF : Senior Research Fellow								
FA : Field Assistant								
Con : Consultant								
DEO : Data Entry Operator								
TA : Technical Assistant								

Institute of Forest Genetics and Tree Breeding Coimbatore

Project No.1.		
Project title: Species recovery using diversity estimate and control pollination in <i>Bruguiera sexangula</i> . Average Index Score : 713.3		
Name of the P.I. Dr B Nagarajan	Budget: Rs 14 029 lakhs	
New CD' ' - DI (D' (1 1	$\mathbf{D}_{\mathbf{u}}(\mathbf{u}) = \mathbf{D}_{\mathbf{u}}(\mathbf{u}) + \mathbf{D}$	
Name of Division: Plant Biotechnology	Duration: 3 years $(2010 - 2013)$	
Long term objectives of the project		
1. To understand life history traits and comprehend reasons for localiz	zed extinctions	
2. To quantify inter and intra population variation using DNA markers	S	
3. To deploy species recovery strategies to replenish the taxon		
4. To sensitize the practicing foresters in the region on management o	f rare mangroves	
Short term objectives of the project		
1. To comprehend reproductive success in the fragments		
2. To enlist all <i>B.sexangula</i> individuals within the region using GPS n	neasurements	
3. To use control and open pollination progenies and do species recov	ery	
Comments of Referees		
Idea and content of the Project		
Studies on species recovery are rare attempts except in some medicinal plants. Such study in a mangrove species is a good idea. The content of the project is very		
good with a brief preamble, literature scan and well defined objectives.		
Relevance of the Project to the Current Needs		
The selected species is one of the important mangrove species which is having a limited distribution in India. As the species is in the process of deterioration and		
extinction, the concept of species recovery is the most relevant and needed one. Such studies on the genetic conservation are to be encouraged.		
Soundness of the Technical Programme		
Selection of the species and the significance of the study have been well explained. Objectives and Technical Programs are clearly spelled out. Genetic Diversity		
studies using DNA markers strenghthen the technical soundness of the project.		
Comments of RAG: Dr. B. Nagarajan, PI of the project presented the project. Dr. Meenakshi Munsi enquired about the role of Bruguiera		
sexangula in their natural habitat. PI informed about the ecosystem services of this species. Dr. G.Kumaravelu enquired about the bird species		
associated with this tree species. PI informed that there are two species of sunbirds (Nectarinia sp.). Chairman appreciated the project and informed		
that the project will also help the first ecotourism village in India-Kum	balangi in Kerala. The project was recommended by RAG	

Project No.2.		
Project title:. Tree improvement of Thespesia populnea – A mul	ti-purpose tree Species.	Average Index Score : 708.2
Name of the P.I.: Kannan C.S. Warrier Scientist C	Budget: Rs.32.916 lakh	
Name of Division: Division of Genetics and Tree Breeding	Duration: 5 years (2010 – 2015)	
Long term objectives of the project		
• Production of superior quality planting stock of <i>Thespesia pop</i> Short term objectives of the project	vulnea.	
 Study the genetic variability and evaluate the germplasm of <i>Th</i> Clonal assemblage, testing and development of suitable packa 	<i>hespesia populnea</i> with reference to grow age of practices.	vth and tree form.
 Screen the germplasm for key insect pests and develop suitable 	le control measures.	
Comments of Referee: Prof. N. K. Vijayakumar Ph.D., Professor	(Rtd.) & Emeritus Scientist, College of	Forestry, Agricultural University,
Vellanikkara Thrissur, Kerala		
1. <i>T. populnea</i> , a truly multi-purpose tree, is having wide adapt proposed the above research project in this species has clearly laid	ability to various agro-ecological region out the objectives of the project as wel	ons of the tropics. The scientist who has ll as its practical and scientific relevance.
2. Considering the multifarious utilities and economic significance of <i>T. populnea</i> , any attempt of genetic improvement in this species will be		
important in the present day tropical tree breeding scenario. The	refore, the programme of work envisage	ed in the concept note is relevant to current
needs.		-
3. Any tree breeding programme starts with collection and evalua	tion of germplasm. This helps in explo	vitation of available natural variability and
identification of superior genotypes for further commercial as well	l as research uses. Characterization of t	the germplasm through molecular tools has
added advantage in further breeding and genetic manipulations of	the species. Thus, the technical progra	amme proposed in the study is quite sound
and suitable to address all the objectives laid out.		
4. Considering the above, I feel that the findings emerging from this study will have far reaching implications in the cultivation as well as further		
breeding programmes of T. populnea.		
Summary of RAG Comments (if any)		
Shri Kannan C.S.Warrier, PI of the project presented the project in	detail. Dr. Meenakshi Munshi asked w	hether any other work has been carried out
on Tree Improvement of this species. The PI answered that no wor	rk has been carried out on Tree Improve	ement, however, the medicinal value of the
species has been studied. Dr. Kumaravelu informed that the species is a bio-shield in coastal areas and opined that it is a very important study and has		
to be taken up. He supported the project for screening the suitable genotypes for straight growth of the stem. The project was recommended by the		
RAG.		

Project No.3.

Project title: Introduction and evaluation of fast growing tree species under Agroforestry systems in different agro-climatic zones of Tamil Nadu.

Average Index Score: 699.7

Name of the P.I. S.Saravanan	Budget : Rs. 17.95 lakhs
Name of Division: Forestry, Land use and Climate Change	Duration: 5 Years (2010 – 2015)

Objectives of the Project

- 1. To establish agroforestry trials with fast growing tree species in farmers' field under different agro-climatic zones of Tamil Nadu.
- 2. To work out the economics of various agroforestry systems with fast growing species.
- 3. To transfer agroforestry technology to rural poor for higher economic returns through sustained productivity.

Comments of Referees : Dr.M.G. Dasthagir, Subject expert, Professor (Forestry) – Rtd.

The comments of the subject expert as follows

I. The idea and content of the project:

It is necessary to evaluate the fast growing tree species specifically under agroforestry system suitable to the different agro-climatic zones of Tamil Nadu. This project is quite appropriate to the present situation of Tamil Nadu.

II. The relevance of the project to current needs:

In the real sense the farmers are in need of information which are the tree species economically important within a short duration. Evaluation or identification of such fast growing trees for different agro-climatic zone is quire necessary for monetary benefit to the farmers. The tree should yield wood, food, fuel, fodder and fertilizer.

III. The soundness of the technical programme:

The objects of the project are relevant to the current research project.

- 1. Split up details are appreciated under work plan.
- 2. In depth research relevant to shoot and root effect on arable to be studied.
- 3. Study has to be undertaken whether tree component has any fruitful contribution on intercrop yield and vice versa.
- 4. This besides allelopathic effect of trees if any should also be under taken.
- 5. Whether the tree component is suitable either in protective irrigated condition or dry-land or problem soil.
- 6. The field trial may be conducted under split plot design with proper espacement keeping in view of canopy width of different tree species.

In short these information will have greater impact on Agroforestry farmers.

Summary of RAG Comments (if any)

Shri S. Saravanan, PI of the project presented the project in detail. Dr. Kumaravelu suggested that the possibilities of carrying out intercropping in between the fast growing tree species need to be studied, as allelopathic effects has been noticed under *Gmelina arborea*. Trials should be carried out to study the effect of these species for different espacement/rotation/end use. He also suggested that a holistic approach should be carried out under this project to find compatible intercropping species. Dr. Arun Kumar, after looking into opined that the number of species under study may be reduced. PI replied that after initial planting only periodic data collection needs to be carried out, hence all the species can be studied. The availability of land for raising these species in Kerala was raised by the chairman. Director, IFGTB replied that the information on these species will be very useful for Kerala. Dr. Kumaravelu stated that 26 lakh hectares of land was available for tree planting in Tamil Nadu. Shri Rawat, ADG, ICFRE queried regarding the procedure by which farmers were identified for raising these field trials. PI explained that advertisements would be placed in local dailies inviting farmers to offer their land for raising the trials. Project personnel inspect the land for their suitability for raising the field trials. Subsequently, MoU is signed between the Director of the Institute and the concerned farmers on satisfying the terms and conditions under the MoU.

RAG recommended the project.

Project No.4.

Project title: Evaluation of *Calophyllum inophyllum* populations for high oil yield.

Average Index Score: 693.9

	8
Name of the P.I. Smt R. Anandalakshmi	Budget: Rs.19.00 lakhs
Name of Division: Seed Technology	Duration: 4 Years (2010-2014)

Long term objectives of the project

• Tree improvement of *Calophyllum inophyllum*.

Short term objectives of the project

- To identify superior trees with high fruit yield and oil content
- To establish germplasm bank of the selected superior trees
- To test the superiority of selected trees and their progeny performance
- To understand the relationship of seed morphology, physiology, biochemical properties and oil yield.

Comments of Referee: Dr.K.T. Parthiban, Associate Professor, Forest College & Research Institute, Tamil Nadu Agricultural University, Mettupalayam.

Relevance

The energy requirement of the country has been steadily increasing particularly the needs of edible and non-edible requirements. India's forests are used with more than hundred tree borne oil seed; of which the potential of Calophyllum inophyllum has been widely recognized. Though the utility of the species is known over decades, the research attempts on the species is dismally modest. Hence the current project has a relevance to meet the needs of domestic and industrial requirements. The idea and content are well organized taking into consideration the basic concept of tree improvement in the species.

Technical

The technical programme has been well designed incorporating the selection programme, screening based on oil content and studies related to variability. However the following can be modified as indicated.

The technical programme indicated establishment of seed orchard, however it is suggested that a progeny or seed source evaluation trial or clonal trial can be established and based on early results these trials can be converted into seedling seed or clonal seed orchard. Similarly, instead of isozyme analysis, molecular studies will help to access variability rapidly and accurately.

Summary of RAG Comments (if any)

Smt R. Anandalakshmi, PI of the project presented the project in detail.Dr. Kumaravelu enquired about the average yield of oil from the plus trees. The PI replied that a 5 year old tree yields around 11 kg fruits. Dr. Kumaravelu enquired about the basis of calculations of oil percentage and asked

the PI to crosscheck the oil percentage and verify the International price of oil furnished in the project. Dr. Kumaravelu suggested broadening the selections and trying clonal approaches like grafting. He also suggested the possibility of including *Derris indica* and mentioned the availability of the species near Mahabalipuram.

The chairman advised the PI to approach NOVOD board on TBOs and the PI informed that already a project on establishing model plantations of *C. inophyllum* and Pongamia has been sanctioned by NOVOD board to the Institute and the present project aims to study populations for high yield. Dr. M. Munshi, enquired about the lifespan of the species and enquired about the completion of the objectives such as selection, clonal propagation and oil estimation. The PI responded that the life cycle is about 50 years and was confident about the completion of the objectives. The chairman appreciated the project because of the medicinal importance, oil content, strong timber and aesthetic value of the species. The project was recommended by the RAG.

Project No.5.		
Project title: Selection for desirable wood properties in Acacia auriculiformis for short rotation timber production.		
	Average Index Score: 686.2	
Name of the P.I. Dr. Maheshwar Hegde, Scientist - C	Budget : Rs. 16.81 lakhs	
Name of Division: Division of Genetics and Tree Breeding	Duration: 5 years (2010 – 2015)	
Long term objectives of the project		
• Development of clones of <i>A. auriculiformis</i> with superior s Short term objectives of the project	stem form and wood properties for short rotation timber production.	
 Evaluation of different provenances of <i>A. auriculiformis</i> for Selection of CPTs for better stem form and wood propertie 	or wood properties. es and vegetative propagation of CPTs.	

• Evaluation of clones for growth as well as stem form in multilocations

Comments of Referee : Dr. Surendran

- 1. Idea and Concept of the project: The concept is good
- 2. Relevance of the project: Development of *A. auriculiformis* genotypes for short rotation forestry is essential and can be used for affrestation and agroforestry.
- **3. Objective of the project:** The title of the project is selection of desirable wood properties for short rotation timber production but in the technical programme it is mentioned to asses the timber quality in the first year itself. It is doubtful that any tangible data can be collected in the first year plantations on wood properties. Further it is proposed to select trees from existing progeny trial only. Selection for trees for short rotation forestry will be different from that of selection for regular tree improvement programme. Hence, technical programme and methodology should be examined . Plus tree selection should not be confined to progeny trials alone but also should be done from existing plantations grown in different areas to exploit genetic diversity. The project proposal is recommended and may be submitted after corrections as indicated.

Summary of RAG Comments (if any)

Dr. Maheswar Hegde, PI of the project presented the project by giving brief background including the work carried out by IFGTB and details on objectives, technical programme and expected outcome. After the presentation Dr. Meenashi Munshi queried the scope of studying the timber quality within the project period. Dr. Hegde explained about heartwood formation and clarified that the the wood properties can be studied from second year to fourth year. Dr. Meenashi suggested including *Acacia mangium*. Dr. Gurudev Singh informed that already research on *A. mangium* is going on in existing project. Dr. Kumaravelu suggested that all the resources from Kerala, Karnataka etc are to be included in the experiments. The chairman suggested collecting the samples from the Kerala plantations also. Dr. Hegde informed about programme on the improvement of Australian acacias being implemented by IFGTB since 1996 and the progency trails established for the selected plua trees. Dr. Kumaravelu suggested to include the *A. mangium* hybrids also in the trial and suggested add the word in the clone in the project title. Chairman said that the project has tremendous scope in Kerala especially as timber and suggested to come out with the result as quickly as possible. As farmers in Kerala are interested in cultivating *A.mangium* instead of *A.auriculiformis*, he asked to initiate efforts to popularize *A.auriculiformis*.

The project was approved by the RAG.

Project No.6.

Project title: Selection and Vegetative Propagation of *Neolamarkia cadamba* (Roxb.)Miq – An alternative species for Pencil , Match Wood and Ply Wood Industries.

Average Index Score: 674.6

Name of the P.I. Dr. A. Vijayaraghavan	Budget : Rs. 24.652 lakhs
Name of Division: Forestry Land Use and Climate Change	Duration: 4 years (2010 – 2014)

Long term objectives of the project

- To survey and select the natural population and existing plantations.
- To standardize the vegetative propagation technology of Neolamarkia cadamba and mass multiplication of the clone.

Short term objectives of the project

- To survey the natural population and existing plantation of *Neolamarkia cadamba* in Tamil Nadu, Kerala and select phenotypically superior trees.
- To standardize the vegetative propagation technique for *Neolamarkia cadamba*.
- To standardize the clonal multiplication of *Neolamarkia cadamba* on a large scale.
- To raise clonal/progeny trials of selected trees in different locations.

Comments of Referee : Dr. Manoranjan Bhanja, Hyderabad

- 1. If IFGTB has targeted this species for tree improvement work because of its industrial importance from commercial point of view and amenability of this species for the genetic improvement of different growth traits, then there should be a long-term tree improvement programme formulated for the this species. May be the present project for this species could be a part of the overall tree improvement programme. Otherwise this type of piece-meal efforts may lose focus on main theme. When I talk about a long term tree improvement programme, I mean that goal. Objectives, scheduled breeding plan, inputs and out puts must be defined. Time -frame for each of these activities and output have to be spelled out.
- 2. The breeding plan should include the selection criteria, probable sub-lines to be included, testing parameters, hybridization schedule etc. in my

opinion, the base population should not confine to the wild population of this species exist in Northern Bengal and North-East States also.

- 3. While aiming at developing clones of this species likes that Eucalyptus and Acacia hybrid, one should attempt to develop some clones for dry lands also apart from other site-specific clones.
- 4. In order to evaluate the genetic diversity of the targeted species and tailor it into the breeding programme, attempt should be made to standardize isozyme and DNA marker techniques since IFGTB has got an elaborate Molecular Marker Laboratory. I assume more significance to this aspect because many times selected individual phenotypes show a close genetic distance and hence the genetic gain per generation become very minimal.
- 5. The comprehensive tree improvement programme of this species should proceed both at family level and individual tree level. The family level includes recurrent selection in each generation and family trial or progeny trail. The output of the genetic improvement in each generation can be realized by reproductive propagules which can go to the plantation programme. In this stream, there should be provision for establishing advanced generation Seed Orchard by including the selected high-yielding families.
- 6. The individual level improvement includes all the components of clonal forestry like selection of CPTs, multi-locational clonal trails and short listing the high-yielding cum site specific clones, standardization of rooting of juvenile leafy cuttings, the coppicing ability of the species, establishment and management of Clonal Multiplication Areas (CMAs) and mass propagation. some of the component like coppcing trails and CMA managements are not found place in the prepared project. APFD Research wing has done some preliminary works on vegetative propagation and CMA establishment for this species in its Field research Center at Rajahmundry.
- 7. Another important aspect of the project should be the creation of new hybrids. The hybridization programme of any species. This will help in inclusion of new clones to the trails in every generation. For the hybridization of this species, there should be a component of studying the reproductive biology of this species and standardizing the art of controlled cross.
- 8. The project does not spell out the development strategy of the clones of this species and step-wise integration of appropriate breeding strategy with the propagation strategy.
- 9. Since one of the important aspect of the establishment of CSO and SSOs, it should be appropriate to work out the mating design of this species and management of the seed orchards such as strategy to select the reproductively incompatible clones of each process of keeping the proportionate number of pollen-donors of each individuals clones in the seed orchards by rouging the surplus numbers of the clones contributing more to the pollination.

- 10. It is not out of the place to bring in the components of crops protection aspects and the nutritional conditioning of the planting stock by fortification with the microbial biofertilizers.
- 11. IFGTB has targeted this species for tree improvement work because of its industrial importance from commercial point of view and amenability of this species for the genetic improvement of different growth traits, then there should be a long-term tree improvement programme formulated for the this species. May be the present project for this species could be a part of the overall tree improvement programme. Otherwise this type of piece-meal efforts may lose focus on main theme. When I talk about a long term tree improvement programme, I mean that goal. Objectives, scheduled breeding plan, inputs and out puts must be defined. Time -frame for each of these activities and output have to be spelled out.
- 12. The breeding plan should include the selection criteria, probable sub-lines to be included, testing parameters, hybridization schedule etc. in my opinion, the base population should not confine to the wild population of this species exist in Northern Bengal and North-East States also.
- 13. While aiming at developing clones of this species likes that Eucalyptus and Acacia hybrid, one should attempt to develop some clones for dry lands also apart from other site-specific clones.
- 14. In order to evaluate the genetic diversity of the targeted species and tailor it into the breeding programme, attempt should be made to standardize isozyme and DNA marker techniques since IFGTB has got an elaborate Molecular Marker Laboratory. I assume more significance to this aspect because many times selected individual phenotypes show a close genetic distance and hence the genetic gain per generation become very minimal.
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- 16. The individual level improvement includes all the components of clonal forestry like selection of CPTs, multi-locational clonal trails and short listing the high-yielding cum site specific clones, standardization of rooting of juvenile leafy cuttings, the coppicing ability of the species, establishment and management of Clonal Multiplication Areas (CMAs) and mass propagation. some of the component like coppcing trails and CMA managements are not found place in the prepared project. APFD Research wing has done some preliminary works on vegetative propagation and CMA establishment for this species in its Field research Center at Rajahmundry.

- 17. Another important aspect of the project should be the creation of new hybrids. The hybridization programme of any species. This will help in inclusion of new clones to the trails in every generation. For the hybridization of this species, there should be a component of studying the reproductive biology of this species and standardizing the art of controlled cross.
- 18. The project does not spell out the development strategy of the clones of this species and step-wise integration of appropriate breeding strategy with the propagation strategy.
- 19. Since one of the important aspect of the establishment of CSO and SSOs, it should be appropriate to work out the mating design of this species and management of the seed orchards such as strategy to select the reproductively incompatible clones of each process of keeping the proportionate number of pollen-donors of each individuals clones in the seed orchards by rouging the surplus numbers of the clones contributing more to the pollination.
- 20. It is not out of the place to bring in the components of crops protection aspects and the nutritional conditioning of the planting stock by fortification with the microbial biofertilizers.

Conclusion

The need for a project on the tree improvement of *N. cadamba* is quite essential keeping in view of the short rotation of this species, faster rate of growth, adaptability to a wider range of agroclimatic conditions and most important is the profitability of this crop from land use point of view.

The only suggestion is that before this species is recommended to the farmer or user agency, a package covering all aspects including the improved planting stock, crop protection, compatibility with other tree crops and the cost economics of farming this species on a commercial level should be developed.

From tree improvement point of view, what is extremely significant is that a long term comprehensive genetic up gradation programme for this species is required to be formulated covering all aspects and in the process, if funding is not available for the programme as a whole at present, asecond project can be formulated subsequently by including the remaining aspects of the total programme

Summary of RAG Comments (if any)

Dr. Vijayaraghavan PI of the project presented the project proposal. Dr. Munshi enquired on the previous studies carried out on this species. The PI informed that no work has been done in the species and Dr. Kumaravelu supported adding that it is a good soft wood species with not much systematic work being carried out. Dr. Munshi queried the time taken for survey to which Dr. Vijayaraghavan replied that the survey is for two years

and the progeny trial will be laid out at the end of second year. Dr. Kumaravelu emphasized that selection procedure should be carried out through ranking method, adopting appropriate methodologies as is being done in other timber species.

The project was recommended by the RAG.

Project No.7.

Project title: Butterfly diversity in relation to landscape changes in the Walayar Valley, at Palakkad Gap in the Western Ghats.

Average Index Score: 674.3

Name of the P.I. Dr.K.R.Sasidharan	Budget : Rs.10.70 lakhs
Name of Division: Biodiversity	Duration: 3 years (2010 – 2013)

Long term objectives of the project

- Monitoring the diversity of butterfly fauna vis-à-vis changes happening in the ecosystem of the Walayar Valley.
- Developing conservation plans for protecting RET butterfly species, if any.

Short term objectives of the project

- To get an overview of the butterfly diversity of the study area.
- To study the butterfly diversity in various landscape elements

Comments of Referee : Dr. George Mathew, Programme Coordinator, Forest Health Division, KFRI Peechi

In the present proposal, it is initiated to study the Butterfly diversity in different landscapes and to use their composition for monitoring environmental changes. In the technical programme, indications have been made on the methods study. This involves laying out study pots in different landscapes and assessing the butterfly diversity in each landscape. The Investigator also proposes to employ the results of his study in implementing conservation of rare and endangered species.

It is indeed a good idea to study the patterns of butterfly diversity of the Walayar Valley which is a meeting place of diverse ecosystems. Although a number of studies have been made in the dense forest areas of Nilgiris and Anamalis, the transition areas have not been fully surveyed. This area is subject to various disturbances of anthropogenic origin such as grazing, firewood collection, quarrying etc. leading to tremendous changes in the landscapes. Several areas have also been replanted with various forest tree species. The impact of these activities needs to be assessed. Because of their close relationship with vegetation, butterfly species composition is a useful indicator to monitor changes that take place in the environment due to various disturbances. While preparing the formal research proposal, the Investigator may incorporate the following aspects, if feasible.

1. The topic of research may cover the entire Walayar Valley.

2. Typical landscapes in the area (forests of different degradation classes, plantations, farmlands etc.) may be identified and plots (study locations) of suitable size identified.

3. The vegetation structure of each landscape may be studied.

4. Observations may be made on the larval and adult host plants of various butterflies found in the area, their seasonality, natural enemies and threat factors.

5. Attempts may be made to recognize species that are characteristics of typical

landscapes in the study area.

6. The effect of eco restoration on the fauna. Perhaps, a small, protected plot may be laid out where butterfly host plants are introduced and the effect of eco restoration studied.

Recommendation: Because of various developmental activities, most of the natural habitats of butterflies are under threat. There is a need to identify the threat and to evaluate survival chances of various species in order to develop ecologically sound conservation programmes. In this context, the topic of research is relevant and the methodology is quite sound. **The Investigator may be permitted to go ahead with the proposed research project.**

Summary of RAG Comments (if any)Dr. K.R. Sasidharan, PI of the project presented the details of the project. Dr.Munshi enquired the possibilities of completing all the works. The PI explained the experience he had in surveying the Nilgiris for Bee fauna and said that he will be able to complete all the activities in the stipulated time. The chairman opined that this study may assist in understanding various landscapes in use to support conservation.

The project was recommended by the RAG.

Project No.8.

Project title: Impact of plantations on ground flora diversity and soil characteristics

Average Index Score: 665.9

Name of the P.I. Dr.C.Kunhikannan	Budget : Rs.20.52 lakhs
Name of Division: Biodiversity	Duration: 3 years (2010 – 2013)

Long term objectives of the project

• To understand the successional trend under plantation environment

Short term objectives of the project

- To study the impact of plantation of exotic and native species on ground flora diversity
- To study the impact of plantation on the soil properties
- To study the impact of plantation on microbial diversity (VAM, Actinomycetes and fungi) and soil fauna.
- To understand the successional trends under the plantation environments

Comments of Referee: Dr. K. Swarupanandan, KFRI, Peechi-680653, Trichur

The central idea of the *Concept Note* is that, by raising plantations we can achieve two things: a. Diversity of the ground flora can be improved, and b. Soil characteristics can be changed positively. The above is valid and is a known fact. Upon the above prelude, it has been suggested that it can be utilized for restoration activities, and also suggests evolving (region specific) restoration models/treatments.

Forest plantations are generally criticized for their monotony (monoculture), high chances of pest and disease, and rapid depletion of soil nutrients. Apart from these bad effects, they are also viewed up on as buffers that reduce the pressure of human population on natural forests.

Raising tree plantations in degraded landscapes is not a wrong practice. Plantations of acacias on dry laterite soils and eucalypts on degraded soils, where other species normally fail to come, have proved to be very useful. Much of our high altitude grasslands were also planted with these species some years back. All these attempts definitely helped to clothe otherwise barren lands, improve moisture retentivity of the soil, the ground vegetation, and the litter cover on the soil. On the other hand, when these plantations are extracted, the results are exposure of the soil, erosion, and again impoverishing the ground flora. So, plantation activity in degraded lands should not be profit/industry oriented, but should be environment oriented.

Growing plantations indefinitely also need not be good to the land. There are many areas where plantations have failed or partially or totally

degraded, eg., many teak plantations. Although in degraded landscapes, plantations in their initial phases would improve the soil qualities and biodiversity, over longer spans of time plantations need not contribute further to biodiversity. Over longer spans there are two possibilities: a. The plantation species will get thinned out, if the species encroaching to the shade of the plantation species are light demanding and aggressive, or b. The canopy of the plantation, after a period of growth will suppress the ground flora, such that its diversity does not progress further. In such a situation, the plantation will transform to be the interest of the industries, which in an unstable/hostile environment is not desirable.

To summarize, growing plantations in degraded/ hostile/ unstable environments, should be only as an environmental measure (only as a cover crop) and not as an industrial activity. As soon as the ground biodiversity gets enriched, either native tree species are to be planted underneath the shade of the plantations where they can establish themselves, or the plantation species has to be thinned out or lopped down, so that the light requirements of the species planted underneath the plantations are met and not starved to death.

The relevance of the project to current needs:

The project has good relevance in the context of increasing afforestation and rehabilitation programmes.

The soundness of the technical programme

The technical programme is OK; however, the focus of the study should be on the environmental side of the trade.

Any other point relevant to the project

The title if modified as, 'Impact of plantations on ground flora diversity and soil characteristics' reads better.

Summary of RAG Comments (if any)

Dr. C. Kunhiakannan, PI of the project presented the project. Chairman asked the PI to evaluate and suggest management practices to be followed to enhance floral diversity and reduce the soil erosion under the plantations, instead just studying the impact of plantations which is a well known fact. He also informed that 80% of the forest areas are under natural forests and only 20% of the forest areas are under plantations and are maintained for meeting certain demands. Hence, the PI was asked to study the viable management practices to be followed in the plantations and the impacts need not be assessed. PI was asked to revise the project accordingly. PI agreed to revise the project. ADG, ICFRE enquired the need of three JRFs in one project. PI informed that each one JRF for i) identification of plants, ii) for insect collection and iii) microflora enumeration respectively.

The project was recommended by the RAG with the above modifications.

Project No.9.

Project title: Chemotyping of Sapindus emarginatus- A potential NTFP of Tamil Nadu for saponins.

Average Index Score: 661.9

Name of the P.I. Smt R. Anandalakshmi	Budget : Rs. 11.50 lakhs
Name of Division: Seed Technology	Duration: 3 years (2010 – 2013)

Long term objectives of the project

• To promote sustainable use and conservation of Sapindus emarginatus

Short term objectives of the project

- To study the variation in saponin content and select elite trees with high saponin yield.
- To conserve the saponin yielding bioresource as germplasm bank

Comments of Referees: Dr. N. Dharamraj, Reader, Department of Chemistry, Bharathiar University, Coimbatore-641046. Relevance

The overall idea to analyse saponin content and to identify candidate plus trees is commendable but the budget has to be reduced

Technical

1. Is the researcher skilled enough to analyse saponin content

2. The budget is very high and unjustifiable. What expenses

have to be done upto Rs.15 lakhs.

Summary of RAG Comments (if any)

Smt R. Anandalakshmi, PI of the project made a detailed presentation. Dr. Kumaravelu informed that the species has good international demand and large scale cultivation of the species is taken up in Maharashtra. He also suggested the PI to visit Thengumarada and Bhavanisagar areas, where natural populations exist. He suggested grafting and high density planting of the species. Dr. Govanda Rao highlighted the export potential of the species. Dr. Arun kumar pointed out that the term Candidtate Plus Trees should be used instead of elite trees. The chairman felt that it was a good project.

The project was recommended by the RAG.

Project No.10.

Project title: Capacity building among tree farmers for handling large scale Eucalyptus clonal propagation.

Average Index Score: 659.4

Name of the P.I. V.K.W. Bachpai	Budget : Rs. 3.00 lakhs
Name of Division: Plant Biotechnology	Duration: 2 years (2010 – 2012)

Long term objectives of the project

• To create awareness among the farmers, farmer groups and NGOs the importance of clonal propagation of Eucalyptus

Short term objectives of the project

• To impart training to farmers, farmer groups about clonal multiplication of *Eucalyptus*

Comments of Referee:

(i) The idea and content of the project

This is one of the best ideas to train the farmers themselves in propagating the Eucalyptus tree in their own fields either for establishing a plantation or for sale.

(ii) The relevance of the project to the current needs

Production of large amount of quality planting stock with less cost will help the wood pulp based industries in acheiveing their targets in production of paper etc., The farmers are also much benefited in selling the planting stock to the industries.

(iii) The soundess of the technical programme

- 1. A detailed plan of work is to be prepared so that a systematic work can be conducted
- 2. Extension workers to be identified to select the interested tree farmers with greater aptitude to do the multiplication work by way of different propagation methods.
- 3. To begin with a stock tree material has to be shown or identified to the concerned farmers and their superiority may be highlighted.

Cost benefit analysis should also be worked out to educate the farmers.

Summary of RAG Comments (if any)

Shri. Bajpayee, PI of the project presented the project in detail. Dr. Meenashi Munshi asked since this species is mandated why this programme was not taken up earlier. Dr. Uthamasamy suggested including research component since this project is for extension activity. Dr. Krishnakumar, Director IFGTB explained that there is no separate extension division and farmers are asking for the planting materials and also the technology. This project reflects the socio economic extension activity. Dr. Meenashi Munshi and Dr. Kumaravelu appreciated the project as it will help in dissemination technology. The chairman opined that this is a important project and mentioned the need of a sociologist in the project and also suggested increasing the number of species and budget. He suggested having connection/Collaboration with NREGA. Dr. Srinivasan informed that the government

schemes to be linked with this project activity including more number of species. Shri R.S. Barua suggested to include a sociologist and a economist in the project. Dr.Kumaravelu pointed that the clonal propagation technology is available for other species also and suggested to include all the species which prove to be cost effective. Mr.Shanmugam pointed that cost effective clones are not available and this issues has to be taken care. The chairman suggested the PI to increase the number of species and budget.

The project was recommended by the RAG.

Project No.11.

Project title: Identification of integrated management methods for the *Eucalyptus* Gall wasp problem in nurseries.

Average Index Score: 656.6

Name of the P.I. Dr. John Prasanth Jacob	Budget : Rs. 2.50 lakhs
Name of Division: Forest Protection	Duration: 2 Years (2010-2012)

Long term objectives of the project

- Assessment of impact of gall damage on nursery seedlings.
- Identification of non chemical and chemical methods of management of gall wasp problem in nurseries

Short term objectives of the project

- Life table studies of *L. invasa* on Eucalyptus.
- IPM methods for management of *L. invasa* in nurseries.

Comments of Referees: Prof. S. Uthamasamy, Retd. Prof. of Entomology TNAU), 45, Vallalar Nagar, Vdavalli, Coimbatore-641 041

The project proposal is good. This invasive pest on Eucalyptus has caused extensive damage to plantations in India. It appears to be elusive to chemical control measures and warrants a more reliable and feasible method. Looking at this angle the project appears to be good and offers scope for research.

The wasp causes severe damage in nurseries of Eucalyptus plantations and spreads fast. Since it is an introduced pest into this country, native natural enemies may be scarce. Until such time it is checked by parasites and predators, farmers and stake holders need to depend on other methods of control. And it should be made available in a short span of time. In this context, the project is a relevant one and assumes significance at current needs.

Technical programme is good. The scientists may try to identify the weak link in the life cycle of pest by taking up life table studies tree the weak link

is established at would be easy to manage the pest in a sustainable manner.

Summary of RAG Comments (if any)

Dr. John Prasanth Jacob, PI of the project presented the project in detail. Dr. M. Munshi opined that this project could be clubbed with the project on "Influence of Eucalyptus species on the natural enemies incidence on the gall wasp *Leptocybe invasa*". The PI explained that the strategies used are different and therefore the project is taken up separately.

The project was recommended by the RAG.

Project No.12.

Project title: Assessment of cellulosic components from wood wastes: Feedstock for Biofuel production.

Average Index Score : 656.1

Name of the P.I. Dr. N. Senthilkumar	Budget : Rs.13.242 lakh
Name of Division: Bioprospecting	Duration: 3 years (2010 – 2013)

Long term objectives of the project

• To enrich the lignocellulosic biomass from forest resources as feedstocks for future biobutanol production

Short term objectives of the project

- Qualitative and quantitative assessment of lignocellulose, cellulose and hemicellulose from wood wastes such as saw dust, wastes from plywood and coir industry as feedstock for biobutanol production.
- Determination of cellulosic components/simple sugars from wood wastes such as saw dust, wastes from plywood and coir industry for biobutanol production.
- To produce biobutanol from wood wastes (lignocellulosic biomass) using standard bioprocess technique.

Comments of Referees: Dr. K.T. Parthiban, Associate Professor, Forest College and Research Institute, TNAU Mettupalayam

Self reliance in energy sector is a viable option for economic growth of the country. The demand for biofuels is not only in increasing but the availability of crude oil is fastly depleting. This demand an alternate fuel which is no doubt that the biofuel would come into prominence. The forest plantation activities and the resultant industrial activities have resulted in huge volume of wood based residues which are either underutilized or unutilized. Hence there is an urgent need to device and develop methodologies to utilize the huge volume of residues. Against this problem, the current project on assessment of cellulose component from wood wastes has been well conceived and the research on this area is needed to meet the

growing demands. Hence the current project has direct relevance.

Technical:

The project aimed at qualitative and quantitative assessment of wood based biomass through cellulose and cellulosic derivatives for which the methodology has been given following the standard procedure. Hence the project is recommended for consideration.

Summary of RAG Comments (if any)

Dr. N. Senthilkumar, PI of the project presented the project. Dr.Meenakshi Munsi enquired about the expertise with the PI on this subject and the methodology to be used. Dr. G. Kumaravelu also enquired about the confidence in the methodology, while appreciating the concept and its relevance for Tamil Nadu. PI informed that it is a new field for him and is confident of doing it. Dr.Meenakshi Munsi informed that DBT is struggling in bioethanol production. Chairman also endorsed the view that the conversion of biomass to butanol is a diificult processes. ADG from ICFRE pointed out that FRI works on this line has not been reviewed and asked PI to contact the Cellulose and Fibre Division at FRI, Dehra Dun. Chairman advised that the Director, IFGTB can link up the other agencies working in this field. Dr.Uthamasamy told that Institute of Microbial Technology, Chandigarh may be contacted. Dr.G.Kumaravelu informed that Dr. Gowtham in Anna University may also be contacted.

The project was recommended by the RAG.

Project No.13.			
Project title: Evaluation of <i>Gmelina arborea</i> Roxb. selections from North Eastern and Southern Regions.			
	Average Index Score : 654.0		
Name of the P.I. V.K.W.Bachpai	Budget : Rs. 11.38 lakhs		
Name of Division: Plant Bio technology	Duration: 3 years (2010 – 2013)		
Long term objectives of the project			
• Evaluation of CPTs selections from North East and Southern region through progeny testing			
Comments of Referees:			
Dr. K.K. Suresh , Professor & Head, Department of Silviculture, TNAU, Forest College and Research Institute, Mettupalayam.			

Gmelina arborea is a very good timber species which needs this type of research for Idetifuying location specific clones for high yield and utilizable biomass recovery. Hence this experiment may be taken up. However a few quires may be answered.

- 1. This species requires good moisture for its growth and hence whether this trial is to be irrigated or raised under reainfed conditions may be looked into.
- 2. CPTs from Tamil Nadu one at the topslip and other parts of TamilNadu, Karnataka and Keral may be included

Summary of RAG Comments (if any)

Shri Bachpai, PI of the project presented the project proposal. Dr. Munshi queried regarding the previous studies carried out on this species to which the PI replied that scanty studies have been carried out in Tamil Nadu. Dr. Munshi informed that DBT had supported a program on micropropagation of *Gmelina* to FRI. Dr. Krishna Kumar informed the house that planting stock of this species are being sold at high price without much consideration on the quality of the mother plant from which the propagules were obtained. The Chairman informed the house that the root bark is used as an ingredient in Dashamula and wanted to know the heritability of the active principle. He suggested that the active ingredient component may also be considered as a selection criteria in the improvement program apart from timber. Dr. Nagarajan informed that cytologically the germplasm in North East is different from the germplasm in South India. Hence, germplasm from all locations should be assembled under this project. Dr. Kunhikannan informed that the National Medicinal Plant Board had supported program on developing agro techniques and chemical analysis of this species during 1997 – 1998. Dr. Munshi informed that the bioprospecting aspects can be supported by Department of Biotechnology. Dr. Arun Kumar, Scientist, IWST, Bangalore opined that the chemical analysis need to be done in the mother plant and hence bioprospecting aspects of the project can be taken up in the second phase of the project. Dr. Kumaravelu suggested that both the studies can be done concurrently. Shri. Ashish Rawat suggested that selections from central India (Madhya Pradesh etc) should also be included in the present study and the PI accepted the suggestions.

Project No.14.

Project title: Evaluation of selected phenotypes of Casuarina for establishment of windbreaks in farmlands.

Average Index Score: 653.3

Name of the P.I. Dr.C. Buvaneswaran	Budget : Rs.14.19 lakhs
Name of Division: Forestry Land Use and Climate Change	Duration: 3 Years (2010-2013)
Long term objectives of the project	

• Designing windbreaks for enhancing productivity in agriculture ecosystems.

Short term objectives of the project

- To evaluate performance of selected phenotypes of *Casuarina junghuhniana* and *Casuarina equisetifolia* as windbreaks.
- To develop Casuarina based windbrake agroforestry system for crop protection and enhanced productivity.

Comments of Referees: Dr. G. Kumaravelu, IFS, Addl. PCCF (Retd) Tamil Nadu Forest Department

The idea is good. But the criteria for selection of phenotypes have to be specific for the stated objectives of the project proposal. The project is to

establish wind breaks. This implies that the phenotypes of casuarina to be selected should be robust, branchy with dense and thick needles. Since the evapotranspiration of the sites in Coimbatore, where the experiment is proposed will be very high, phenotypes with deeper root system/architecture have to be specifically targeted for use in the project. Only then, positive results could emanate out of this experiment which could be adopted by the users.

Most of the selections of the provenances in C. equisetifolia and C. *junghuhniana* are aimed at branchless, clear bole types, amenable for high density planting with maximum biomass. Therefore, priority in this project should be different than that used for selection so far. It is suggested, that more emphasis can be given to C. *junghuhniana* (Indonasian and Kenyan provenance progenies/ phenotypes). Phenotype combing should be attempted to identify the most robust, salty spray tolerant individuals existing now in the already established coastal shelterbelts of the East Coast of Tamil Nadu. Since salt tolerant phenotypes would also most likely to be moisture stress tolerant, they may outperform others in mitigating the ill effects of wind. In Coimbatore district, there are many wind mills with large extent of lands available for planting under them. But these trees have to be of less height and more with leaf and stem biomass. The effect of planting them underneath wind mills and their effects, if any, on the 'deflecting of wind' to the fan area of wind mill or otherwise can be monitored. The wind velocity could be read from the efficiency of the wind mill electric generation quantum. It is suggested that 75% emphasis should be given for rainfed cultivation areas and 25% for protective irrigated systems of agroforestry. The project is relevant for the need of the day. The title of the project may replace the word 'provenances' by inserting 'phenotypes'

Summary of RAG Comments (if any)

Dr. C. Buvaneswaran, PI of the project presented the details of the project. The chairman enquired about the number of rows to be planted and the spacing to be adopted and will there be any economic benefit for the farmers?. The PI informed that three rows at spacing of 0.5 m is envisaged for creation of windbreaks. It is envisaged to evaluate the effect of windbreaks on the yield of crops. Models will be developed for harvest of these trees at regular intervals and other benefits like nitrogen fixation will be evaluated. Dr. Kumaravelu informed that although similar experiments with *Pawlonia* in China did not yield intended results many such windbreaks have been reported to result in reduction of total evaporation caused by dry desiccating winds.

Sh. Kumaravelu opined that to provide better economic benefits, 2 to 3 species like *Gmelina arborea* and *Melia dubia* could be considered in addition to Casuarina. Future farming programmes should take care of both the food and wood needs of the society. He informed that thick leaved and highly branching tree species that come up very well in coastal areas could be attempted. The chairman suggested trying different combinations of species and felt that value of wood is very important for selection of species.

Dr. Uthamasamy enquired about the region in which the experiments will be implemented. The PI responded that the experiments would be laid only in irrigated areas of the plantain farms. Dr. Utthamasamy felt that the title should be modified as "Evaluation of selected phenotypes of Casuarina for establishment of windbreaks in farmlands in the western zone of Tamilnadu". The PI replied that the title is only to address the problem and agreed to modify the title. The project was recommended by the RAG with the above modifications.

Project No.15.

Project title: Genetic improvement of Ailanthus excelsa and Ailanthus triphysa through clonal technology and hybridization.

Average Index Score : 651.6

Name of the P.I.: D. Rajasugunasekar, Scientist C	Budget: Rs. 29.61 lakh
Name of Division: Division of Genetics and Tree Breeding	Duration: 5 years (2010-2015)

Long term objectives of the project

• Genetic improvement of Ailanthus excelsa and Ailanthus triphysa through clonal technology and hybridization

Short term objectives of the project

- To study vegetative and phenological variation of in *A. excelsa* and *A. triphysa and* estimate genetic variability using molecular markers within and between the populations of Ailanthus species
- Standardization of vegetative propagation methods in *Ailanthus excelsa* and *A. triphysa and establish the Clonal Plantation in different agro climatic zones of Tamilnadu*
- To understand pollination ecology and breeding system in *A excelsa* and *A.triphysa*
- To standardize suitable mating design between the species and produce full sib families.
- To validate the hybrids using morphological parameters and DNA markers.

Comments of Referees: K.T. Parthibhan, TNAU Coimbatore

Wood based industries are vdrawing heavily the raw material requirement from the forest till the recent past. But due to enunciation of 1988 forest policy which directed the wood based industries to look for their own raw material. The concept of drawing wood from forest is changing. This promoted farm driven tree husbandry models in association with wood based industries. Among the wood based industries, match and splint industries are of significant importance due to their socio economic impact. These match industries are drawing raw material from unorganized sources and in recent times organized industrial wood plantations are gaining momentum. But for want of suitable varieties and technologies, the achievement in this front is so far dismally modest. Under such circumstances, the current project has direct relevance to meet the demands of industries as well as growers.

Technical

The project has been designed with an objective of improving the genetic resources of Ailanthus spp. Through variability, exploitation through clonal technology and developing breeding system. The objectives are well designed however the breeding programme envisaged in the project may be dealt as a separate project which needs sustained efforts due to complication in reproductive biology of the species. Otherwise the project is recommended for consideration.

Summary of RAG Comments (if any)

Shri Rajasugunasekar, PI of the project presented the project including the objectives, technical program, anticipated output, budget and Reviewers comments. Dr. Meenakshi Munshienquired whether the objective of genetic improvement of the species can be achieved under the project. Shri Sekar replied that the hybridization of the two species proposed to be carried out under the project, will result in genetic improvement of the species. Dr. Kumaravelu enumerated the importance of A. excelsa in Tamil Nadu and also the feasibility of growing A. malabaricum up to 50 km from the seacoast where the moisture level will be high. He enquired the PI if there are any natural hybrids available. Dr. Unnival felt that the objectives of the project were highly ambitious. Dr. Munshi also voiced the same concern as the entire gamut of tree improvement from selection to molecular marker studies had been envisaged in the same proposal. Dr. Munshi queried regarding the use of markers in the population analysis to which Dr. Yasodha replied that dominant markers like RAPD and ISSR will be used to assess the genetic variability. The Chairman, Shri Manoharan opined that the project can be phased out with genetic diversity studies to be carried in the second phase. Dr. Govinda Rao explained the collaborative work being carried out by FC&RI and Vasan Industries and queried whether all the four species are being considered for hybridization. Shri Sekar replied that no species from North East is being considered and hybridization will be conducted in A. excelsa and A. malabaricum. Dr. Kumaravelu suggested that the project objectives may be revamped to include standardization of vegetative propagation; clonal multiplication techniques for operational scale plantation programs; assemblage of clones and mapping the traits. The chairman suggested that the project may be recasted in consultation with Dr. Govinda Rao, TNAU with modified objectives that are achievable in a reasonable time frame for both the species. Dr. Kongu Kulandhaisamy, progressive farmer wanted inclusion of studies on pest control measures in Ailanthus plantations. Dr. Kumaravelu suggested that 5% Jatropha oil spray being attempted in TAFCORN and NPV virus spraying may also be tried.

The project was recommended by the RAG with the above modifications.

Project No.16.

Project title: Exploration of potential native natural enemies with a special emphasis on microbial biocontrol agents for management of casuarina hairy caterpillar, *Lymantria ampla* and Ailanthus defoliators, *Eligma narcissus* and *Atteva fabriciella*

Average Index Score: 649.8

Name of the P.I.: Dr. A. Balu	Budget: Rs. 14.08 lakhs
Name of Division: Forest Protection	Duration: 3 Years (2010-2013)
Long term objectives of the project:	

• Exploring of potential native natural enemies for development and promotion of biological control method of management of the insect pests in forest ecosystems.

Short term objectives of the project

- Investigation on the diversity of native natural enemies in the nurseries and plantations of casuarinas and Ailanthus in Tamil Nadu.
- Analysis of the biotic and abiotic factors influencing the occurrence and distribution of the natural enemies
- Evaluation, selection and identification of potential candidates for management of the targeted pests.

Comments of Referees: Dr. S. Suresh, Prof.of Agriculture Entomology, TNAU, Centre for Plant Protection Studies, Department of Agricultural Entomology, Coimbatore-641003.

Exploration of potential native natural enemies with a special emphasis on microbial biocontrol agents for management of hairy caterpillar, *Lymantria ampla* and *Ailanthus* defoliators, *Eligma narcissus* Gramer and *Atteva fabriciella* Swed.

As indicated in the project special emphasis may be given to the microbial pathogens in the same line as that NPV formulation developed by KFRI, Peechi for Teak defoliator, *Hyblaea puera*.

Pentatomid predators are another candidate which can easily be mass multiplied in the laboratory and later can be released in the Forest Ecosystem for self sustenance.

Summary of RAG Comments (if any)

Dr. A. Balu, PI of the project presented the project. Shri Manoharan enquired about the strategy to be adopted. Dr. Balu informed that microbial based biocontrol method will be used. He also informed the work done in controlling the pests of Teak using NPV. Dr. Kumaravelu mentioned that jatropa oil can be attempted for IPM. Dr. Balu replied that the project is exclusively on biocontrol methods and Jatropa oil application will be evaluated in other projects. Dr. Arun felt that the pinpointing the biotic and abiotic factors responsible for pest out break will be difficult to assess in a period of 3 years. The PI informed that abiotic factors like temperature, humidity will be recorded during the survey and the factors influencing the pest outbreak will only be an offshoot of the project. Dr. Uthamasamy suggested looking for microbial pathogen populations as natural enemies. The project was recommended by the RAG

Project No.17.		
Project title: Evaluation and identification of optimal parameters for flowering and fruit set in different Tamarind (Tamarindus indica L.)		
orchards.	Average Index Score: 649.3	
Name of the P.I. : A.Mayavel	Budget : Rs. 9.80 lakhs	
Name of Division: Genetics and Tree Breeding	Duration: 3 Years (2010 – 2013)	
• To evaluate the influence of soil, climate and physiological factors on flowering and fruiting of tamarind orchards and to investigate the reason for low productivity.		

• To study the effect of shoot and root pruning for improving flower and fruit production in unproductive tamarind orchards

• To asses the effect of manures, potassium nitrate and paclobutrazol for enhancing vegetative growth, flowering and fruit development.

Comments of Referee: K. Manivannan

Idea and concept: Tamarind (*Tamarindus indica L*) is a tropical multipurpose tree with many uses especially in food, beverage with medicinal values, fuel as well as for some industrial purpose. The research project proposed for the evaluation and identification of optional parameters on flowering and fruit set in tamarind of different places have been well formulated. The objectives have been well defined. As the trees are grown as orchards, road side avenue trees of multipurpose values, enhancement of fruit yield by adopting various techniques will be very useful to the growers.
 The formulation of the project fulfills the current needs of growing tamarind as an orchard crop.

3. The technical programme has been well outlined and at the same time it should be elaborated with more details. As tamarind is a perennial crop of long duration, the duration as three years to study the effect of paclobutrazol may not be sufficient.

The following line of thinking will be more useful:

- 1. Identification of plus trees, based on fruit yield, flowering behavior and fruit quality.
- 2. Season of fruiting.
- 3. Response for inorganic/organic nutrition; growth regulator application.

Summary of RAG Comments (if any)

Shri Mayavel, PI of the project presented the project in detail. Dr. Subramaniyam suggested the PI to look into the work done by TNAU and include those germplasm resources also in his studies. Dr. Kumaravelu informed that clonal plantation of tamarind were established with the application of organic chemicals, manure etc by the Tamilnadu Forest Department during 1992-1993. He informed the experiments carried out such as pruning, trenching to enhance the fertility. Dr. Nagarajan informed that there are 6 high yielding clones are available, but there is a need to focus on silvicultural aspects to improve the fertility characters. The chairman suggested adding coconut coir pith in the plantations to improve moisture retaining capacity of the soil. The project was approved by the RAG members.

The project was recommended by the RAG.

Project No.18. Project title: Management of pre and post harvest seed pests and diseases on seeds of fast growing native tree species. Average Index Score: 637.4 Name of the P.I. Dr. John Prasanth Jacob Budget : Rs. 8.36 lakhs Name of Division: Forest Protection Duration: 3 Years (2010-2013)

Long term objectives of the project

• Standardization and generation of feasible management measures for pre and post harvest pests and diseases on seeds of fast growing native tree species.

Short term objectives of the project

- Assessment of extent of damage, periodicity of incidence of pest and diseases during pre and post harvest period.
- Development of an inventory on the natural enemies complex of key seed pests and diseases.
- Standardization and generation of feasible management measures for key seed pest and diseases.

Comments of Referee: Prof. S. Uthamasamy, (Rtd. Prof. of Entomology, TNAU) 45, Vallalar Nagar, Vdavalli, Coimbatore-641041 The idea and content of the project are good and is timely considering the seriousness of the pests both in field and storage.

Decline in forest wealth is a serious issue debated at various levels. One of the reasons for reduction in forest wealth and produce both qualitatively

and quantitatively is the heavy losses caused by the pests and diseases. Checking the spread of these invaders has become a serious issue in that night

type of adaptable technologies to manage the pests and diseases are not available to stake holders at the appropriate time. Generation of management

techniques that are sustainable at small farmer level as well as during storage of seeds would go a long way in addressing this issue. In this context, I

feel the project is relevant and timely.

The technical programme appears to be sound. However, the following points may be considered while developing the project

- (i) The title of the project may be revised as "Management of pre and post harvest pests and diseases on seeds of fast growing native tree species. The focus will be on management.
- (ii) Under objectives, enumeration and routine assessment may be deleted. More objectivity should be on known pests and diseases that damage the trees mentioned under background.
- (iii) The Department of Entomology, TNAU, Coimbatore has developed a number of gadgets/traps for management of pests on stored products. Some of them may be used to control pests during post harvest storage.
- (iv) Emphasis may be given to non-chemical methods of management.

Summary of RAG Comments (if any)

Dr. John Prasanth Jacob, PI of the project presented the project in detail. The Chairman enquired if there were no reports available on these pests. The PI clarified that no information is available on seed pests.

The project was recommended by the RAG.

Project No.19.

Project title: Documentation of agroforestry systems and wood flow to wood based industries in Tamil Nadu.		
	Average Index Score: 637.2	
Name of the P.I. K.Ravichandran	Budget : Rs. 10.49 lakhs	
Name of Division: Forestry Land Use and Climate Change	Duration: 3 years (2010 – 2013	
Long term objectives of the project		
• Develop strategies for effective supply chain system and fac system.	ilitating marketing of agroforestry wood through market outlook information	
• Use of Market Intelligence System as an early warning for the f	farmers for the raw material market.	
Short term objectives of the project		
To document the various agroforestry systems practiced in Tam	nil Nadu	
• To quantify the wood flow from farm and agroforestry systems	to various wood based industries in Tamil Nadu.	
• To study the supply chain in wood based industries.		
• To assess the contribution of farm and agroforestry systems to t	the GDP.	
• To suggest suitable models to farmers in different regions for ad	doption.	
Comments of Referee : Dr. C.N. Pandey, Director, IPIRTI, Bangalore		
It is a well conceived project proposal with clear cut objective	es and proposed work plan, dealing with survey and utilization of agroforestry	
produce. It is well recognized that in future agroforestry system is g	going to produce more industrial wood and non industrial wood than forestry	
proper. This system not only helps in improving the productivity, it also directly helps farmers in bringing economic upliftment to them as well as		
employment generation in the rural areas. There has always been lack of linkage between growers and wood based industries, resulting in		
improper planning in plantation activities in the state. Any attempt made for documentation of agroforestry systems and wood flow to wood based		
industries in a state like Tamil Nadu will be very useful as no reliable information as on date is available either in forest departments or wood		
based industries. In the light of the above mentioned facts, I strongly recommend for undertaking the above project proposal by your institute.		
Summary of RAG Comments (if any)		
K. Ravichandran, PI of the project presented the proposals. Dr. Kumaravelu expressed that the study is very relevant especially when the Government		
is embarking on a mega project at the National level. He felt that the industrial consumption of different types of wood also should be studied as it is		
important to the planners. The PI replied that it would be taken care in the project. The chairman informed the house that as per the supreme court		
directive, the states need to submit a report on the wood requirement	for the wood based industries located in the states. He suggestd to consult the	

above document. Shri. Srinivasanstated that web enabled market price fluctuations should be the outcome of the project. The chairman stated that the relationship between the buildup area of a building and the quantity of wood used has been worked out already and this relationship needs to be conferred under the project. Shri. Rawat suggested that review of literature in the project need to be improved and a statistician consulted for finalizing the methodologies to be followed. He opined that more specific methodologies for data collection should be included in the proposal and FSI need to be consulted for the required data.

The project was recommended by the RAG.

Project No.20.		
Project title: Influence of <i>Eucalyptus</i> species on the natural enemies	s incidence on the gall wasp <i>Leptocybe invasa</i> .	
	Average Index Score: 631.9	
Name of the P.I. Dr. John Prasanth Jacob	Budget : Rs.17.60 lakhs	
Name of Division: Forest Protection	Duration: 3 Years (2010-2013)	
Long term objectives of the project		
• Identification of the influence of Eucalyptus species on the natural enemy incidence on the gall wasp <i>Leptocybe invasa</i> . Short term objectives of the project		
 Identification of oviposition preference and growth rate of <i>L. invasa</i> on different species of Eucalyptus. Identification of host preference, growth and development of natural enemies <i>Quadrastichus mendeli</i> and <i>Selitrichodes kryceri</i> on galls in different eucalypts species. Identification of the biochemical basis of attraction/deterrence of <i>L. invasa</i> galls by <i>Quadrastichus mendeli</i> and <i>Selitrichodes kryceri</i> 		
Comments of Referees :		
In view of the seriousness of the gall problem, the project has been initiated with the approval of the DG, ICFRE. Hence the referees comments was not sought for the project.		
Summary of RAG Comments (if any)		
Dr. John Prasanth Jacob, PI of the project presented the project in detail. The chairman felt that use of resistant clones is practical and enquired about		
the reason for pursuing projects on Gall, if resistant clones are available. Mr. Srinivasan explained that highly productive clones like clone 10 are not gall resistant and have therefore become unsuitable for further plantation programmes. The PI explained that the present resistant clones may become		
resistance breakdown. Dr. Uthamasamy explained about pest escape being the cause of selecting for pseudo resistance, which are unreliable and lead		

to breakdown. Therefore, the real mechanisms of resistance need to be understood by understanding the tritrophic interaction.

The PI informed that the project has been sanctioned by the DG in view of the seriousness of the gall problem, but requires the ratification by RAG and RPC.

The RAG approved the proposal and recommended the project.

Project No.21		
Project title: Development of inter and intra specific hybrids in <i>Eucalyptus camaldulensis</i> .		
	Average Index Score: 631.9	
Name of the P.I.: Dr.B.NAGARAJAN Scientist E	Budget : Rs. 14.01 lakh	
Name of Division: Division of Plant Biotechnology	Duration : Three years (2010 – 2013)	
Long term objectives of the project		
• To hybridize <i>E.camaldulensis</i> selections and develop full sib factors	amilies	
• To develop suitable controlled pollination methods for develop	oing <i>E.camaldulensis x E.pellit</i> a hybrid	
Short term objectives of the project		
• To document phenological patterns and variations among E ca	maldulancis clones	
 To document phenological patients and variations among E.ca To evaluate reproductive success under artificial pollination or 	anditions	
Comments of Referees: C. Surendran		
1. Idea and concept of the project		
The concept of development of hybrids of <i>E. camaldulemis</i> is good and timely.		
2. Relevance of the project		
Sine Eucalyptus is widely grown in Southern States, development of hybrids with desirable wood properties and yield will be helpful for		
increasing the yield and quality of the timber.		
3. Soundness of the technical programme		
The technical programme envisaged is good. The technical programme should be elaborated further and more details to be furnished on the		
execution of the project and outcome.		
The project proposals are recommended.		

Summary of RAG Comments (if any)

Dr. B. Nagarajan, PI of the project presented the project in detail. Dr. Kumaravelu, queried that whether qualitative criteria such as cellulose, lignin traits will be considered while developing inter and intra specific hybrids. Dr.Nagarajan replied that in this programme it is envisaged to develop hybrids between selected phenotypes of E.camaldulensis and also between other species. Dr. Kumaravelu stressed the importance of including the wood traits in a breeding programme. Shri Srinivasan, suggested to include the gall character also in the breeding programme and include the entomologist in the project. He also sought the source of pollen for the Breeding Programme. The PI replied that Queensland origin is being used as pollen parent. The chairman informed that lot of research has gone in for Eucalyptus improvement and he wanted to know application aspects of the research findings in Kerala. The chairman suggested to conduct a survey to know how much research result has gone to the field/general public in general and Eucalyptus in particular. Dr. Srinivasan informed that in Andhra Pradesh farmers are doing controlled crossing work in the Eucalyptus clones at the ground level instead of using ladder. He suggested the application of flower inducing hormones for carrying out control crosses at ground level. Dr. Nagarajan replied that the flower inducers some times make the plant to produce infertile/ aborted pollen. The project was approved by the RAG members.

The project was recommended by the RAG.

Project No.22

Project title: Selection and evaluation of Casuarina clones for power generation by gasification technology

Average Index Score: 631.7

Name of the P.I.: Mr. A.Mayavel, Research Officer	Budget: Rs.21.06
Name of Division: Division of Genetics and Tree Breeding	Duration: 5 years (2010 – 2015)

Objectives of the Project

- To select superior clones of *C. equisetifolia* and *C. junghuhniana* for high density and colorific value.
- To asses the fuel characteristics of selected feed stock for suitability to gasification technology.
- To mass multiply identified clones of *C. equestifolia* and *C. junghuhniana* and conduct multi-location trials by adopting high density planting system
- To evaluate and identify site specific clones for energy production.

Comments of Referee: D. Ramesh, Assistant Professor, (Bioenergy), Department of Farm Machinery, Agricultural Engg. College and Research Institute, Coimbatore-641003.

1. The idea and content of the project:

The basic idea for this concept is very good and the content of concept may be focused on general information like importance of energy plantation, mention the reasons for selection of *C. equestifolia* and *C. jhunguinia* species among the different wood species and yield, spacing and life span.

2. The relevance of the project to current needs:

The biomass gasification is well proven technology for power generation and already used in the sugar mills for power generation from sugarcane bagasses. The authors are choosing the gasification technology to evaluate their selected wood species and this technology more helpful for meeting out the rural people energy needs. They focused on identify and mass production of selected will have more advantages to the project.

3. The soundness of the technical programme:

- 1. Selection of identified superior clones of *C. equestifolia* and *C. jhunguinia* based on its high density, yield and life span.
- 2. To assess the fuel characteristics of selected feed stocks for better suitability to gasification technology.
- 3. To mass multiplication of identified clones of C. equestifolia and
 - C. *jhungunina* and conduct the multi location trials by adopting high density planting system
- 4. To evaluate and identify site specific clones for energy plantations.

Summary of RAG Comments (if any)

Shri Mayavel, PI of the project presented the project in detail. Dr. Kumaravelu appreciated the project and suggested, wherever possible using existing clonal plantations for the study and opined that new plantation need not be raised. Shri Shanmugam supported and informed that plantations are available in large scale for testing. The chairman agreed and informed that it has tremendous scope for application.

The project was recommended by the RAG.

Project No.23.		
Project title: Determination of the target genes through gene-silencing techniques for the management of <i>Leptocybe invasa</i> (Hymenoptera:		
Eulophidae), an invasive pest in eucalyptus plantations in India.		Average Index Score: 628.1
Name of the P.I.: Dr. Mathish Nambiar-Veetil	Budget: Rs. 37.47 lakhs	
Name of Division: Plant Biotechnology	Duration : 4 years (2010 – 2014)	
Long term objectives of the project	•	
• To develop Eucalyptus RNAi transgenics for insect resistance.		
Short term objectives of the project		

- To identify genes involved in growth and development of *Leptocybe invasa*
- To test the potential of siRNA molecules of the identified genes for inhibiting growth of *L. invasa*.

Comments of Referee: Raj. K. Bhatnagar, Group Leader, Insect Resistance, International Centre for Genetic Engineering and Biotechnology, New Delhi

Concept note evaluation report: Determination of the target genes through gene-silencing techniques for the management of *Leptocybe invasa* (Hymenoptera: Eulophidae), an invasive pest of Eucalyptus in India

The scientific rationale and proposed methodology are adequately presented. Of the three target genes proposed for evaluation I have some concern about the neuropeptide coding genes being used as targets. Several of such regulatory peptides are produced upon post-translational processing. Unless precise amino acid sequence and corresponding coding regions are accurately read there is a possibility of off targeting. The proposal is left vague for the identification of genes involved in growth and development of the insect. The PI should consider being more precise in the choosing the specific target genes under this category.

The budget and time frame are appropriate. Of the expected outputs my concern will be of the delivery of the identified molecule. In the absence of any specific road map the method of delivery may become a limiting step. Nevertheless the project presents good scientific endeavor and should be funded.

Summary of RAG Comments (if any)

Dr.Mathish, PI of the project presented the proposal. Dr. Munshi enquired regarding the genes targeted in the study. The PI replied that since no gene sequences are available for gall wasp, comparative genomics analysis will be done using available sequences from other insect pest for RNAi studies and he further enumerated the list of target genes short-listed for the project. Dr. Munshi further enquired if it would be possible to target all the short-listed genes to which the PI replied that only few genes will be targeted based on the comparative genomics data. Dr. Subramanian, Principle Scientist, Sugarcane Breeding Institute, Coimbatore, enquired if it was possible to rear the insect in the laboratory and the possibility of culturing the larvae in lab to which Dr. Jacob, Scientist, IFGTB replied that the grub lives inside the plant tissue and hence rearing can be done inside the plant tissue only. Dr. Kumaravelu enquired if any genes have been identified in Israel, as they are the pioneers in the biocontrol studies of this pest. It was informed by PI that no such studies are available. Further, he enquired the reason for variation in levels of oviposition in different clones and Dr. Govinda Rao, Dean, TNAU added that certain clones are not affected by the wasp. Shri. Jayaraj, HoD, FLUCC division, IFGTB, enumerated the studies conducted in the Institute towards identification of clones/ seed sources tolerant to gall wasp. Dr. Krishna Kumar, Director, IFGTB informed the house that an All India coordinated project on eucalypt gall has been formulated for funding by MoEF. Dr. Munshi enquired regarding the delivery mechanism of the molecule into the insect to which the PI replied that it will be introduced through diet. She also enquired regarding the process towards monitoring gene silencing. Dr. Mathish explained that several genes will be silenced and they would be monitored by qRT-PCR. Dr. Govinda Rao enquired how the study would be conducted when the genome of the insect is not known while the eucalypt geno
Mathish stated that only the insect would be silenced. Chairman enquired the field application of the study and the present status of similar research in Israel. Dr. Krishna Kumar clarified that the CoPI of the project Dr. Jacob had visited Israel and since this area is not worked, the proposal was submitted. Dr. Kumaravelu queried regarding the viability of the proposal towards cost effectiveness and applicability importance. The chairman further expressed that transgenic or non transgenic will command the same market and hence even is the proposal is theoretically viable, the economic viability of the project needs to be considered. Dr. Govinda Rao stated that it would not be practical to plant the whole eucalypt plantations with transgenics. Dr. Kumaravelu suggested that it would be practical to multiply resistant clones and deploy in infested areas, to which Dr, Krishna Kumar replied that such work are in progress but they are only escapes. He also reiterated that the project was proposed based on the strength of the PI and the laboratory. Dr. Gurudev Singh, HoD, Genetics and Tree Breeding division, IFGTB added that as several strategies are used to control the pest, this could be an alternate strategy. The chairman reaffirmed that the proposal was theoretically good but needed field applicability. Dr. Yasodha, Scientist, IFGTB added that once the genes are identified and transgenics developed they can be clonally multiplied and deployed in affected areas. The project was recommended by the RAG.

Project No.24.		
Project title: Development of Tree DNA Fingerprint database.		
	Average Index Score: 620.6	
Name of the P.I.: R.Vivekanandan	Budget : Rs.4.80 lakhs	
Name of Division: Computer	Duration : 3 years (2010 – 2013)	
Long term objectives of the project		
Short term objectives of the project		
• Devise a format for DNA fingerprint data for different type of markers and production populations		
Development of an interactive database		
Comments of Referee: Dr.K.T. Parthiban, Associate Professor, Forest College & Research Institute, Tamil Nadu Agricultural University,		
Mettupalayam.		
RELEVANCE:		
Pedigree of the species / population is very important for any tree improvement work coupled with conservation of array of genetic resources. In this		
concept, the current project on development of tree DNA finger printing database will play significant role in providing database of the genetic		
resources which not only help to assess the diversity but also help to protect the intellectual property rights of the Institute in general and the scientist		

in particular. Hence the current project has direct relevance and **it is recommended for development into a detailed proposal. TECHNICAL**

There are no details on methodology and hence there is little scope for any comments. However the project is recommended for consideration

Summary of RAG Comments (if any)

Shri R.Vivekanandan, PI of the project presented the project. Dr. Meenakshi Munshi enquired whether the project intends to use the database of IFGTB alone. PI informed that initially the IFGTB database will be used, subsequently the database will include other ICFRE Insitutes. In long run this database will include all willing partners and facilitate the researchers in formaulation of projects and publishing of papers. The project was recommended by the RAG.

Project No.25		
Project title: Influence of beneficial microbes in con	ferringsalt tolerance to Casuarina clones	
	Average Index Score: 616.6	
Name of the P.I.: Dr. V. Mohan	Budget: Rs. 18 lakhs	
Name of Division: Forest Protection	Duration : 5 years (2010 – 2015)	
Long term objectives of the project		
• Isolation of adapted beneficial microbes (AM an	d ECM fungi, Frankia and PGPRs) from saline soils.	
• Selection of the most effective isolates of beneficial microbes in conferring salt tolerance under <i>in vitro</i> .		
• Determination of effect of salinity on the growth, beneficial microbial interaction and mineral nutrition of selected <i>Casuarina equisetifolia</i> clones in nursery.		
• Demonstration of the possibilities for revegetation of salt affected soils with <i>Casuarina equisetifolia</i> clones, in association with beneficia microbes.		
Short term objectives of the project		
Comments of Referees:		
Ref 1: Dr. C. Mohanan, Senior Scientist, Pathology Division, KFRI Peechi Kerala		
Topic of research is very interesting and selection of the tree species is also very appropriate. However, background information provided, especially		
on salt tolerant species is meager. These are many indigenous as well as exotic tree species highly tolerant to salinity. However, species highlighted		
(Larix, Acer, Fagus, Picea, Pseuodotsuga, Quercus, Robinia, Eleagnus) in the background information are not being exploited here. In fact,		

Casuarina is a good example of salt tolerant, fast growing tree species. Casuarina was introduced during the British period for meeting the fuel wood demand of the stem engine and different species were raised on a large-scale along the east and west coastal belts. *Casuarina equisetifolia* is a highly salt tolerant species and has been successfully raised on coastal areas and also on river banks and inlands. Tolerance to extreme soil conditions including drought is attributed to the actinorrhizal association (*Frankia* spp.) at the absorption zone. ECM as well as VAM fungi have also been recorded on Casuarinas but their role is less documented. In fact, endophytes in root, bark, stem and foliage may be playing a major role in resisting the extreme salinity as in the case of mangroves and mangrove associates. So far, there is no dispute over the salt tolerance ability of *Casuarina*. The level of tolerance may vary amount *Casuarina* species and clones.

Specific Comments:

Objectives: It is not clear whether both ECM and VAM fungi associated with Casuarina will be studied for their efficacy.

Actinorrhizal (Frankia) association is very rare and Casuarina and Alnus nepalensis are the tree species exhibiting this rare phenomenon. However,

most of the tree species exhibit VAM, ECM or both associations. The role of Frankia spp. as well as stem and bark endophytes also need to be

investigated to get a clear picture on the salt tolerance ability as well as drought and disease resistance of Casuarinas.

Ref 2: Dr. R. Narayanan, Professor, Department of Agricultural Microbiology, TNAU, Coimbatore

The project envisages to isolate AM fungi from saline soils particularly in coastal areas where Casuarina is grown extensively. It further attempts to screening of AM fungi for salt tolerance which will give a useful germplasm of AM fungi for the coastal belt. Mycorrhizal association provides the host plant for nutrient and water uptake as well as disease resistance. High salt content in the root region of the plant retard the growth of several plants including *Casuarina*. However, with mycorrhizal association the *Casuarina* can tolerate the high level of salinity and grow well. Mycorrhizal fungi are known to alleviate the salt stress in plants. The selection of most effective AM fungal isolate for salt tolerance is a valuable objective and such strains can be multiplied and supplied to the farmers as inoculum for promoting *Casuarina* growth. Demonstration for revegetation of salt affected soils with *Casuarina equisetifolia* clones will be very good approach which will give full proof of the research findings.

The project objectives are well written and the technical programme are sound. The budget given for the project is adequate.

The concept note is well written and the themes attempted in the project are achievable and valuable. I strongly recommend the project for support of the Institute for funding.

Summary of RAG Comments (if any): Dr. V. Mohan, PI of the project presented the project. Dr. Meenakshi Munsi enquired about how to differentiate the beneficial, saprophytic and unknown microorganisms from the samples collected for isolation of beneficial microorganisms. PI informed that screening will be done through inoculation and pure culturing and finally testing in the host species for their influences. Dr.G. Kumaravelu opined that Halophytes may be explored for obtaining microbes for salt tolerence. He also suggested the PI to screen Mangrove species and associated Microflora and test the screened strains in casuarina in conferring salt tolerance. The project was recommended by the RAG.

Project No.26.	Project No.26.	
Project title: Development of a GIS based information system for	Casuarinas and Eucalyptus species.	
	Average Index Score: 616.3	
Name of the P.I.: R.Vivekanandan	Budget : Rs.22.604 lakhs	
Name of Division: Computer	Duration : 3 years (2010 – 2013)	
Long term objectives of the project:		
Short term objectives of the project		
• To build comprehensive information system on casuarinas and 1	Eucalyptus for effective decision making.	
Comments of Referee: Dr. M. Paramathma, Prof. and Nodal Office	er (TNAU) Centre for Excellence in Biofuels, TNAU Coimbatore	
• The GIS information of the cultivated tree species very much needed.		
• The project can not be limited to Casuarina alone and it can built GIS data for commonly cultivated tree species like Eucalyptus, Teak etc.		
• Besides, establishment of market information can be added to the project. FCRI, Mettupalayam is developing market intelligence cell for Casuarina and Eucalyptus through NAIP project where IFGTB is one of the technical consortium partner. Hence, comprehensive GIS information can be developed for trees by involving the two organizations.		
General recommendation : The project is recommended for approval with the recommendation that the project need to address more species which are		
commonly cultivated in southern India.		
Summary of RAG Comments (if any)		
Shri R. Vivekanandan, PI of the project presented the project. Chairman opined that duplication of works to be avoided. ADG, ICFRE asked the PI to		
prepare the flow chart of activity and that has to be included in the project. He also opined that the project period appears to be very long. He also		
asked the PI to contact FSI and confirm the information already available with FSI. PI informed that the project will help in expertise to be developed		
in GIS and facility to be created.		

Project No.27 Project title: Evaluation of certain forest flora based on ethnobotanical records for their pesticidal properties against important forestry insect pests. **Average Index Score: 612.2** Name of the P.L.: Dr. N. Senthilkumar **Budget :** Rs. 15.804 lakhs **Duration :** 3 Years (2010-2013) Name of Division: Bioprospecting Long term objectives of the project • Identification of plant species with bioactivity against insect pests from Forest. Short term objectives of the project Survey, collection and taxonomic confirmation of candidate plant species. Standardization of extraction methods for candidate plant species using different organic solvents. Laboratory bioassay with extracts of candidate plant species. ٠ Extension of outcome of the project to user target groups. Comments of Referee: Dr. K. Murugan, Professor, Department of Zoology, Bharathiar University, Coimbatore The concept note is well framed, related to the current research on pest management with sound technical programme. The objectives are clearly made to achieve the goal. Considering toxic residues and pollutants of pesticides in environment and food stuffs, the use of botanicals for the pest management especially forestry insect pests management is need of the hour. The proposed concept note is fulfilling the need. Selection of forest

flora to test their bioefficacy based on ethnobotanical records as stated by the PI will minimize the goose chases of plants having pesticidal property. Therefore, the proposal may be considered for approval.

Summary of RAG Comments (if any)

Dr. N. Senthilkumar, PI of the project presented the project. The chairman suggested to use the already existing ethnobotanical records like the wealth of India instead of carrying out survey to know the ethnobotanical use. Mr. Unival also suggested that the existing records be used for the project. The PI mentioned that such records are not available for pesticidal properties of forestry species.

Project No.28 Project title: Studies on oil: chemical composition, antifeedant, insecticidal and antifungal activities of tree born oil seeds. **Average Index Score: 603.6** Name of the P.I.: Dr. S. Murugesan **Budget :** Rs.17.022 lakhs Name of Division: Bioprospecting **Duration :** 3 years (2010 – 2013) Long term objectives of the project To develop suitable procedure for separation, isolation and characterization of active principles as natural pesticide and pre-formulations for application at nursery level. Short term objectives of the project 1. To evaluate the inhibitory potency of oils of C. inophyllum, H. laurifolia and S. indica and synthetic pesticides/fungicides against teak defoliator Hyblaea puera and some of the fungal isolates. 2. Chemical investigation of the major compounds of the oils, which make easy to investigate Active Principles. 3. To develop suitable pre-formulations for application at nursery level in combination with commercially available oils like neem/pongam. Comments of Referee: Dr. S. Mohankumar, Department of Plant Molecular Biology & Biotechnology, TNAU Coimbatore Biopesticides play a major role in IPM. Botanical based indigenous biopesticides, besides reducing the cost of plant protection, they protect the environment from many hazards. Neem based commercial formulations are only available. Botanicals from *Calophyllum inophyllum*, *Hydnocarpus* laurifolia and Samadera indica are not available as ready to use products for farmers. Hence the scope of the project is appropriate and objects are well-defined. The technical programme is designed well. More focus has to be given for stability of formulations and development of farmer friendly ready to use formulations. If these formulations are successful, the women self-help groups functioning in TamilNadu may be trained in low cost technologies to develop the formulation and that will result in sustained use of the product according to the need of local area. Summary of RAG Comments (if any) Dr. S.Murugesan, PI of the project presented the project. Chairman enquired about the justification of utility of Hydnocarpus species as pesticides, as this species has tremendous potential in Ayurvedic medicines. He insisted such species should be studied for their medicinal properties.

Project No.29		
Project title: Introduction and evaluation of match wood species of	of Andamans in the high rainfall zone of Tamil Nadu and Kerala for growth	
and yield.		
	Average Index Score : 592.5	
Name of the P.I.: J.M.Shujauddin	Budget : Rs. 11.99 lakhs	
Name of Division: Forestry, Land Use and Climate Change	Duration : 3 years (2010 – 2013)	
Objectives of the Project		
• To establish species introduction trials with alternative matchw	ood species from Andamans for demonstration purpose.	
• To assess the growth parameters and matchwood qualities (splint and box) of the said species to meet the match wood demand for match industries.		
Comments of Referee:		
The project proposal is very relevant and is a novel proposal. The result of the project may also be useful for the farmers of Andaman and Nicobar		
Islands. It is suggested to include the species namely Ailanthus kurzii, Albizia stipulata, Evodia glabra and Sideroxylon longipeliotam if possible in		
the projects which are found in Andaman and Nicobar Islands.		
Summary of RAG Comments (if any)		
Shri J.M. Shujauddin, PI of the project presented the details of the project. Dr. Kumaravelu suggested that the species being studied may also be		
tested for plywood properties. Chairman said that there is no clear felling in Kerala and felt that teak is unlikely to be replaced by Bombax insignis or		
Neolamarkia cadamba. He enquired the PI on the opportunity cost for raising these species. Dr. Kumaravelu suggested that the species can also be		
studied for their suitability as bio-shield for coastal areas. These species if found suitable can replace the single species being used at present in over		
1100 km of coastal tract. Shri R.S. Barua enquired whether the plants / seeds being brought to the mainland need to be quarantined. It was informed		
that no quarantine is required to be carried out.		

Project No.30		
Project title: Study of genetic variation in Pterocarpus santalinus in	Tamil Nadu for growth and heartwood content	
	Average Index Score: 579.1	
Name of the P.I.: Dr. Maheshwar Hegde, Scientist - C	Budget : Rs. 23.19 lakhs	
Name of Division: Division of Genetics and Tree Breeding	Duration : 5 years (2010 – 2015)	
Long term objectives of the project		
 Selection of superior clones which produce higher wood as well a <i>P. santalinus</i> for commercial timber production in Tamil Nadu. Short term objectives of the project 	as higher heartwood and desirable grains. Selection of suitable sites for planting	
 To study the variation in heartwood content in trees according to edaphic and other site factors. To select trees in plantations for higher growth, desirable grains and heartwood content To estimate the percentage of occurrence of wavy grained types in plantations. To find correlation of morphological traits in trees to wavy grains. To multiply vegetatively the identified trees for further clonal testing and germplasm assemblage. 		
Comments of Referee: Dr. C. Surendran		
 Idea and Concept of the project: <i>P. santalinus</i> is classified as endemic and endangered species. It is understood that State forest Department has stopped felling this tree to conserve population. The concept is timely Relevance of the project: The proposed project is relevant under present context since it is considered as endemic it is to be carefully examined whether the outcome will be useful for different stake holders. 		
3. Objective of the project: The objective proposed is specific and the areas to be surveyed etc., are not mentioned. It is better to collect literature on the tree and project formulated. Lot of research work already done at FC &RI Mettupalyam. The department of tree breeding may be consulted before formulating this project as already a project on similar lines had been operated at FC&RI.		
Summary of RAG Comments (if any)		
Dr. Maheswar Hegde, PI of the project presented the project in detail. Dr. Kumaravelu briefed the work done by Andhra Pradesh Forest Department and Tamilnadu Forest Department and suggested to use the existing the data and carry forward the research. Dr.Meenashi Mushi queried how to do genetic diversity studies in the species. PI has explained the methods adopted for studying the genetic variation. Shri. Uniyal informed that the relevant technical details are available with private agencies. The PI answered that agency like Biotrim has no seeds, but clones are available, hence this		

project for evaluation of clones, has been taken. Dr. Arun Kumar informed the house the studies carried out in a twenty year old plantations of red sanders and stated that about 70 trees in the plantation have had no heart wood, hence he emphasized to take up this project and informed that variability study is the first step for any tree improvement programme. The chairman opined that the species has medicinal value and in Kerala the plantations have been raied by Forest Department, but the value of the species is not known locally. Dr. Subramaniyam supported the project proposal to find out the character (wavy pattern) whether it is heritable or not, trials may be laid out and studied.

Project No.31		
Project title: Selection and evaluation of Teak for low rain fall and	eas of Tamil Nadu.	
	Average Index Score: 576.8	
Name of the P.I./ Dr. K. Palanisamy Scientist E	Budget: Rs. 16.81 lakh	
Name of Division: Division of Seed Technology	Duration: 5 Years (2010 – 2015)	
Long term objectives of the project		
• Survey and delineation of different teak populations of dry, ve	ery dry and moist in Southern and Central India.	
• Collect seeds, raise nursery and study the variability.		
• Establish field trials with different seed sources in low and me	• Establish field trials with different seed sources in low and medium rain fall areas of Tamil Nadu.	
• Evaluate the field trials for growth and productivity.		
Comments of Referee: Dr. Paramathma, Director of Research, T	amil Nadu Agricultural University, Coimbatore	
Project content		
The idea and content of the project is well conceived. The project is formulated to promote teak cultivation in low rain fall areas by identifying		
suitable genotypes. The conceptualization of the project is addressing the research gap existing in teak.		
Relevance of the project to current need		
The present scenario of forestry sector is to promote tree cultivation in the non-conventional forest area as farm plantations to meet the wood		
requirement of the country.		
The project is planned to come out with high yielding genotypes in teak suitable for low rainfall area. This is one of the wanted area of		
research because, teak is a prominent tree species which being promoted extensively as block plantation by different stakeholders. Hence, the		
proposed project is highly relevant and addresses the current need of the stakeholders.		
Technical program		

The technical program is properly designed to select high yielding genotypes suitable for low rainfall areas. However, the following comments can be considered to enrich the research proposal.

Before resorting selection there is no mention in the project to study the existence of base population variability. Hence, prediction of variation in the base population need to be added in the project as one of the objectives.

There is no mention about method of selection to be resorted.

Emphasis need to be given to multiply the selected CPTs through vegetative propagation which can be used for progeny testing in addition to establishment of seedling progeny.

If already selected CPTs are available with other ICFRE institutes, Maharastra forest department that can be included in the project for multilocational testing.

General recommendation: The project is recommended for approval.

Summary of RAG Comments (if any)

Dr K. Palanisamy, PI of the project presented the project in detail. Dr. Meenashi Munshi asked why the survey need to be conducted. The PI replied that for the identification of the best seed sources in the low rain fall area, the survey is required to be conducted. Dr.Unniyal queried since the trial is envisaged in the low rainfall areas of Tamil Nadu, why the seedsources from the moist areas included. Then the chairman pointed that why should we insist growing teak in low rainfall areas as the teak prefers to grow and better production in moist localities. He opined that there are several other species suited to drier localities. The PI shared his experience in establishmen of a clonal trial plot in Tirunelvelli, a dry area in Southern Tamilnadu. He said the clonal selections from wetter areas showed good performance. Following this lead, the seedsources from moist areas have been included. While doing a testing for quality all possible options have to be incorporated. Dr.Arun Kumar opined that the program is good but the population size quite large, logistically it is difficult to survey all the seedsources. The PI answered that existing selections from Maharastra, Tamilnadu, Karnataka and Kerala shall be included in the trial. The project was recommended by the RAG.

Project No.32	
Project title: Studies on Essential Oils: Chemical constituents and toxicity assessment of the Leaf oil of Lantana camara from Tamil Nadu.	
	Average Index Score: 567.2
Name of the P.I.: Dr. S. Murugesan	Budget : Rs. 17.442 lakhs
Name of Division: Bioprospecting	Duration : 3 years (2010 – 2013)
Long term objectives of the project	
• To evaluates the chemical constituents of the leaf essential oil of <i>Lantana</i> camara collected from various parts of the country differing in their	

flower color (including natural forest and hill areas), and biopesticidal properties in order to select promising ones Short term objectives of the project

- Survey and collection of *Lantana camara* in various parts of Tamil Nadu differing in their flower color (including natural forest and hill areas), and processing for extraction.
- Evaluation of the inhibitory potency of essential oils of *L. camara* in comparison with synthetic pesticides/fungicides against target pests and diseases of forestry tree species.
- Chemical investigation of the major compounds of the oils, which make easy to investigate Active Principles.
- To develop suitable pre-formulations for application at nursery level in combination with commercially available oils like neem/pongam.

Comments of Referee: Dr. S. Chandrasekran, Professor, Toxicology Laboratory, Department of Agricultural Entomology, TNAU Coimbatore

The project "Studies on oils, chemical constituents and toxicity assessment of the leaf oil *Lantana camara* from Tamilnadu region" is proposed with a good intention to explore the active principle for pest management in forest ecosystem. In this connection, I would like to state that work cited in the present project has been extensively carried out in different parts of the country from 2000 onwards. Maje kodunmi –O Fatope, (2002). Isolated the triterpenoides of lantadene, oleanoic acid and other terpenes and tried against insect pest @ of 5000 µg/ml and proved the toxicity effect. Instead of starting this project from isolation and characterization of the active principles of Lantana plant, explore the availability of the terpenoids and evaluate against the forest pest. However all the terpenoids are photoliable and hence, its effectiveness in the field is doubtful unless UV protectants are impregnated and also find a suitable method of application in the forest ecosystem before taking up such studies because the outcome of the studies should work in the field. With the available literature, I presumed that this *Lantana camara* is a noxious weed and the scientist of whole world developed biocontrol agents and fungal pathogens to manage this weed and few promising results are available and hence its effect on pests may be studied.

Suggestions:

- 1. A detailed review of literature on the above subject may be prepared and modify the objective accordingly.
- 2. If active principle of *Lantana camara* is proved to be effective against some forest tree pests, how it is going to be applied in the forest ecosystem in what means of appliances.

Summary of RAG Comments (if any)

Dr. S. Murugesan, PI of the project presented the project. Dr.Meenakshi Munsi enquired about the sufficiency of the project period and she opined that ten years may be required for bringing out the formulations. PI informed that the project envisages only the pre-formulations and not the formulations as envisaged in the objectives of the project. However, Dr. Meenakshi Munsi expressed her apprehension about the project period. PI informed that he is confident in completing the works well within the project period.

Project No.33

Project title: Quality assessment of selected fodder trees and climbers: Nutritional and Antinutritional Factors.

Average Index Score: 565.5

Name of the P.I.: Dr. S. Murugesan	Budget : Rs.21.802 lakhs
Name of Division: Bioprospecting	Duration : 3 years (2010 – 2013)

Long term objectives of the project

• To find out potential fodder tree species, with high nutritional value to feed the livestock, characterize and identify active compounds of commercial, if any.

Short term objectives of the project

- Screening of potential fodder tree species based on the primary nutrients, antinutritive factors & chemical composition in different climatic condition (early summer and winter).
- Evaluation of selected tree fodders based on *in vitro* dry matter digestibility (IVDMD).
- Variation of tissue specific (leaf, twig, pod) nutritive properties of the fodder.

Comments of Referee: Dr. G. Vijaykumar, Ph.D., Prof. and Head, Department of Forage Crops, Centre for Plant Breeding and Genetics, TNAU Coimbatore

- 1. The idea and content of the proposed project were set forth clearly.
- 2. As a traditional practice, trees are the major source of fodder for the small ruminants in the semi-arid areas. In the light of the facts above, the relevance of the project is meeting the current needs and the same is introduced in an impressive manner. The objectives are clearly defined.
- 3. The trees are chosen carefully to meet the objectives of the study. However, perusal of the technical programme reveals ambiguity on "different climatic conditions". Different climatic conditions may be spelled out for more clarity.
- 4. Not withstanding the minor suggestion pointed out above, the proposed project may play an important role in future. Hence the concept note may be accepted.

Summary of RAG Comments (if any)

Dr. S. Murugesan, PI of the project presented the project. Chairman enquired about the number of fodder species to be evaluated under this project. PI informed that 21 species will be evaluated in this project. Chairman expressed his apprehension on how many of these species listed in the project are likely to be used as fodder and he stated that the list provided is not worthwhile as fodder species as they are important timber species and has other viable uses. He asked the PI to shift the list and to explore and include herbs and shrubs which are available in plenty and not having any other important utility. He also informed that if good fodder species of herb and shrubs category is found out then there exist a chance of growing them

under forest canopy by the Forest Department as undergrowth for meeting fodder requirement. Chairman asked the PI to revise the project accordingly. Dr.G.Kumaravelu opined that wild plants which are preferred by the wild animals may be considered and evaluated for biochemical analysis. He also informed that Tamil Nadu Forest Department has prioritized the list of native fodder species which may be consulted. He asked the PI to explore very fast growing species like *Pisonia* species as well.

The project was recommended by the RAG with the above modifications.

Project No.34

Project title: Biotransformation of some secondary metabolites by sporulate surface cultures of *Frankia* strains for nodulation capacity in *C. equisetifolia* and *C. junhuhinana*.

Average Index Score: 551.1

Name of the P.I.: Dr. S. Murugesan	Budget: Rs.15.922 lakhs
Name of Division: Bioprospecting	Duration : 3 years (2010 – 2013)

Long term objectives of the project

• Biotransformation of some specific active constituents by sporulated cultures of *Frankia* stains in comparison with submerged liquid cultures, and be tested for nodulation capacity of important forest tree species.

Short term objectives of the project

- Biotransformation of active constituents by sporulated surface cultures, submerged liquid cultures & with spore suspensions.
- Analysis of the sample with chromatography methods.
- Identified unique bioactive constituent to be tested for nodulation capacity in *C. equisetifolia* and *C. junghuhniana*.

Comments of Referee: Dr. R. Narayanan, Department of Agricultural Microbiology, TNAU, Coimbatore

The idea of the project to identify bioactive constituents in Frankia is good and valuable. In India, Frankia research is limited due to difficulty in isolation and pure culture maintenance. Since the problem of pure culture isolation and maintenance has been achieved by IFGTB laboratory, the next step in Frankia research is to study the characteristics of the isolates and their various application aspects. This is the current need and this is rightly attempted through this project on "Biotranformation of some secondary metabolites by sporulate surface cultures of *Frankia* strains for nodulation capacity in *C. equisetifolia* and *C.junhuhinana*".

The technical programme and brief methodology indicated in this project proposal is adequate to execute the project. The research team is already experienced in isolation of Frankia and hence the possibility of success is assured. The budget proposed is sufficient.

Summary of RAG Comments (if any)

Dr. S. Murugesan, PI of the project presented the project. Dr.G.Kumaravelu opined that having pure culture of Frankia is a difficult processes. PI informed that Dr.A.Karthikeyan, who is the Co-PI of the project has achieved in isolation and maintenance of pure culture of Frankia. ADG, ICFRE enquired about the relevance of the project in poverty alleviation and questioned whether this project is need of the hour, in the context of the limited fund available with ICFRE. He also opined that the project is a fundamental research of looking into biochemical aspects of nodulation. Dr. G.Kumaravelu asked the PI that practical utility like tailoring Frankia for enhanced nodulation can be thought of in this project. He also added that as in case of Rhizobium, mass multiplication protocols for the Frankia cultures can be standardized to make available for farmers and wood based industries to use in casuarina cultivation, instead of this basic research approach. Chairman also concluded that as ICFRE has limitation in funding, the need of this kind of fundamental project at present time may be reconsidered. The PI remarked that the project has tremendous scope in the future in view of the climate change.

The project was recommended by the RAG.

Project No.35		
Project title: Molecular analysis for population differentiation and	d mating system in Acacia auriculiformis using dominant and codominant	
markers.		
	Average Index Score: 536.4	
Name of the P.I.: Dr. A. Shanthi	Budget : Rs. 12.00 lakhs	
Name of Division: Plant Biotechnology	Duration : 3 years (2010 – 2013)	
Long term objectives of the project		
To generate molecular data for formulating advanced breeding programme of Acacia auriculiformis		
Short term objectives of the project		
1. To quantify genetic diversity amongst the Acacia auriculiformis selection using ISSR markers.		
2. To study the mating system in Acacia auriculiformis using Microsatellite marker.		
Comments of Referee:		
General comments		
The focus of the project is to identify the pollen contamination and mating system of the population by ISSR and SSR markers is highly useful for population improvement in <i>Acacia auriculiformis</i> .		

There is no information in the technical program about the number of genetic resources used for the molecular study. Generally, If more genetic

resources are used more markers will be used to find out pollen contamination and out crossing ratio.

Technical program

The technical program is well planned to meet the requirements of the project. The data interpretation and analysis method was not clearly mentioned in the proposal.

General recommendation: The project is recommended for approval by considering the above comments.

Summary of RAG Comments (if any)

General comments

The focus of the project is to identify the pollen contamination and mating system of the population by ISSR and SSR markers is highly useful for population improvement in *Acacia auriculiformis*.

There is no information in the technical program about the number of genetic resources used for the molecular study. Generally, If more genetic resources are used more markers will be used to find out pollen contamination and out crossing ratio.

Technical program

The technical program is well planned to meet the requirements of the project. The data interpretation and analysis method was not clearly mentioned in the proposal.

General recommendation: The project is recommended for approval by considering the above comments.

Project No.36	
Project title: Studies on orthopteran insect pests of forestry importa	ance
	Average Index Score: 522.8
Name of the P.I.: Dr. N. Senthilkumar	Budget: Rs. 17.592 lakhs
Name of Division: Bioprospecting	Duration : 3 Years (2010-2013)

Long term objectives of the project

• Bioecology and management of key insect pests of important forestry species.

Short term objectives of the project

- To explore orthopteran insect pests of tree species in natural stands, plantations, social and agroforests in Tamilnadu.
- To study the seasonality of selected orthopteran insect pest species in major tree species and workout the correlation with abiotic factors.
- To study the bionomics/bioecology of selected orthopteran insect pest species.
- To evolve management strategies for major orthopteran insect pest species on economically important tree species

Comments of Referee: Dr. K.P. Sanjayan, Director, GRI, Chennai

The project proposal is well conceived and the Scientist has laid special focus on the orthopteran pest of forest trees. Several species of grasshoppers have been recorded to defoliate young trees of the forest and with their capability to migrate in swarms they can cause large-scale damage. Very little is known on the bionomics of most of these orthopteran pests particularly on aspects pertaining to the host range within the forest area, their seasonal occurrence and extent of damage. While intending to study the diversity of the grasshoppers and their periodicity of occurrence, the Scientist has also proposed to study the host selection and host preference of selected species which would throw more light on their trophic relationship. The proposal also includes an element of management strategy to control the orthopterans using contact, systemic, granular, botanical and microbial insecticides. I feel that this is a holistic project proposal that is well conceived, relevant and with sound technical programme. I recommend that your Institute may implement this study.

Summary of RAG Comments (if any)

Dr. N. Senthilkumar, PI of the project presented the project. The chairman mentioned that every insect is important and requires control measures only when the loss due to the incidence exceeds the economic threshold level (ETL). The PI informed that to control the pest within the ETL, IPM strategies are being followed. The project would help study grasshoppers in forest ecosystem that could potentially become pests in agricultural crops. Dr. Kumaravelu enquired if there was any outbreak due to Orthopterans. Dr. Uthamasamy mentioned about the Locusts problems in Africa, and the recent occurrence in Gujarat. No major outbreak of grasshoppers have been observed in peninsular India. However local outbreak of grass hoppers was reported in Aruppukottai. In Srivilliputhur, local outbreak of surface grasshoppers in cotton was noticed. Dr. Jacob informed that some grasshopper pests have been observed in Teak. Mr. Ashish Rawat, enquired if there was any demand from the stakeholders for this type of work. The PI replied that there was no demand. The Chairman added that the project was anticipatory in nature. Mr. Ashish Rawat enquired about the justification of JRF in the budget and asked if Field assistant would suffice. The PI replied that either of them would meet the needs of the project. The chairman felt that only persistent pests need to be taken up. Dr. M. Munshi enquired about the number of projects that could be taken up by scientists. The Director informed that a Scientist is expected to take up to 5 projects and as the PI has been transferred to IFGTB only recently, he has submitted 3 projects. Dr. M. Munshi felt that the projects submitted by the PI were unrelated. The chairman asked about the function of the grasshopper. The PI replied that the insect serves ecological function and are primary consumers. Dr. Kumaravelu suggested taking up projects for controlling invasive exotics like Mikania which is threatening the local biodiversity.

The Director pointed out the research work carried out on the bee fauna by the IFGTB. This project helped us in uderstanding the dynamics of beefauna, pollination biology and ecology. Similarly such studies will enable documentation of Orthopteran populations in the forests for future reference and immediate understanding of the Orthopteran organisms in forest ecosystem. The project was recommended by the RAG.

Arid Forest Research Institute, Jodhpur

Project No.1

Project title : Micro-propagation & field evaluation of selected bamboo species.		
	Average Index Score :694.44	
Name of the P.I.: Dr. I.D.Arya Scientist- F	Budget : Rs. 20.92 Lakhs	
Name of Division: Forest Genetics & Tree Breeding	Duration : 5 years (2010-2015)	
Long term objectives of the project		
• Large scale multiplication of bamboo through tissue culture, field plantation and establishment of demonstration plots. Short term objectives of the project		
 1.Establishment of <i>in -vitro</i> cultures of different bamboos. 2.Development of <i>in- vitro</i> shoot cultures and <i>in- vitro</i> rooting. 3.Standardization of optimum medium for shoot multiplication and root development. 4.Hardening and acclimatization of tissue culture plants. 5 Field trial of tissue- culture raised plants at different sites. 		
Comments of Referee		
The referees suggested that objectives of the project are very important, Scientific merit, originality and quality of the proposal is excellent.		
Project action plan is clear. The proposal in summary is excellent	t. The second referee mentioned that propagation of bamboo in Rajasthan is	
important as may improve soil condition and provide raw material to the farmers. This project may contribute immensely in livelihood if it clears		
the barriers of growing bamboo in desert areas. Whole action plan is systematic JRF (1) and FA(1) has been demanded it seems to be justified.		
Bamboo may play a vital role in livelihood. Success of this project will open a new area for land use & entrepreneurship.		
Comments of RAG		
Title of the project should be changed as suggested by RAG as follows: "Micropropagation & field evaluation of selected bamboo species". Two		
more species i.e. Dendrocalamus strictus and Bambusa bambo. may be included. To include extension component in the project and make efforts		
to pass the technology to other institutes. The field survival percentage to be monitored carefully as it goesdown exponentially. ADG (PF)		

suggested to make linkages/ collaborations with State Forest department for field plantation. RAG recommended the project for approval of RPC.

Project title : Coordinated Project on Integrated Management of Khejri Mortality for Socio-Economic Upliftment in North-East Rajasthan.

Average Index Score : 656.84

Name of the P.I.: Dr. S.I. Ahmed	Budget : Rs. 142.0 Lakhs
Name of Division:	Duration : 5 years (2010-2015)

Long term objectives of the project

• To develop and provide such a technology that can help in upliftment of socio-economic status of the farmers.

Short term objectives of the project

- In-depth studies on the biotic (pests /diseases/nematodes) and abiotic factors (water table/change in land use pattern) of khejri mortality and to standardize the optimum dose of effective treatment.
- Tree association and interaction with soil variables.
- Participatory assessment of socio-economic aspect of Khejri mortality on farmer's community.
- Development of tissue culture techniques for clonal multiplication of selected tree of *Prosopis cineraria*.
- Dissemination of existing technology and the control strategy for effective management of Khejri mortality.

Comments of Referee

The PI is well experienced to execute this work. The second referee suggested that project proposal is excellent but will have great challenges.

Comments of RAG

The project is very important as was commented by RAG members, emphasised the importance of this Khejri project as Khejri is the life line of Rajasthan and is identified as a tree for future therefore research work on its management in general and Khejri mortality in particular is required. All the RAG members appreciated the proposal. It was suggested to pose the project proposal before external funding agencies since it is of multi-institutional project. The factor related to ground water analysis and impact should be elaborated in the project proposal. RAG recommended the project for approval of RPC. recommended the project for approval of RPC.

Project No.3

Project title : Tissue culture studies for mulitiplication of selected plus trees of economically important plant-Boswellia serrata.		
	Average Index Score : 637.37	
Name of the P.I.: Dr. Sarita Arya, Scientist –E	Budget : Rs. 14.72 Lakhs	
Name of Division: Forest Genetics & Tree Breeding	Duration : 5 years (2010-2015)	
Long term objectives of the project		
• Development of tissue culture protocol for multiplication of Boswellia serrata and field trial. Short term objectives of the project		
 Establishment of aseptic cultures. Development of in-vitro shoot cultures and in-vitro rooting. Standardization of different medium for shoot multiplication and root development. Hardening and acclimatization of tissue culture plants. Field plantation and establishment of Demonstration plots. 		
Comments of Referee The referees suggested that objectives of the project are important, Scientific merit and quality of the proposal is very good. Project action plan is clear. The proposal in summary is very good. The PI is well experienced to execute this work. The second referee suggested that project proposal is excellent but will have great challenges.		
Comments of RAG		
<i>Boswellia serrata</i> is a good resin yielding plant and has very good demand in national and international market, thus good plus tree for collection of explants should be selected. Revised the action plan as suggested by preponding the activity of field trials so that demonstration trial can be laid in 4-5 th year. One of the experts advised to select high resin yielding CPT for the sample collection. RAG recommended the project for approval of RPC.		

Project No.4		
Project title: Identification of soil vegetation relations and indicator species for assessment and rehabilitation in lower Aravalli of Rajasthan.		
	Average Index Score : 612.72	
Name of the P.I.: Dr. G.Singh, Scientist –F	Budget : Rs. 11.70 lakhs	
Name of Division: Forest Ecology	Duration: 4 years (2010-2014)	
Long term objectives of the project		
• Utilization of soil indicators data in assessing land degradation	on and rehabilitation programme.	
Short term objectives of the project		
 Study on physical properties and nutrient status of soil derived from different parent material Study on vegetation structure and indicator species on dominant soil types 		
Comments of Referee		
Referee I The proposal is well through and in fact, such basic researches are need of the hour to focus on applied research. However, investigators must include following before initiating the project		
* Gradient analysis using suitable ordination technique to work o	ut soil-vegetation complex relationship.	
* The stand level phonologies at least of woody vegetation must	be included in the proposal.	
1-Literature search-very good		
2-Objective rating for applied research- very important		
3.Objective rating for development-Important		
Scientific merit-Excellent		
3. Method and approach-High		
4. Project Action plan/Design-clear		
5. Manpower Requirement-Sufficient		
6. Time Requirement-A good estimate		
7. The budget requested –Well estimate		
8. The proposal-Excellent	Page 53	

Referees 2
In light of the title of project slight modification in short term objectives as suggested
1. Literature Search-Good
2. Project Objectives-Very Important
From a development point-Very important
Scientific merit-Very Good
3. Methods and Approach-High
4. Project Action Plan/Design-Clear
5. Manpower Requirement-Sufficient
6.Time Requirement-
7.The budget requested-Well estimate
8. The Proposal-Very Good

Comments of RAG -

Project is good, there is a need to update the earlier research and literature. Lot of work was done on site and indicator species in Malva and Banswara. Therfore in the present study the correlation of soil with indicator species will be useful and the comparative studies can be done by using secondary data. The size of plot area can be selected by using different statistical methods. Include extension component in the project. Sh Bharat Taimni suggested to select sites depending on rainfall pattern. RAG recommended the project for approval of RPC.

Broject Me? Induction of resistance in rohida (Tecomellia undulata (Sm.) Seem.) against stem canker		
Project title: Study of salt tolerance through gene expression pattern analysis. Average Index Score : 602.63		
Name of the P.I.: Dr. Sangeeta Singh, Plant Pathologist	Budget : Rs. 18.396 lakhs	Average Index Score:601.05
Name 8f the Pilon: Protection Kanto Scientist D	Budgeton: Bsyears (20128-90 Hakhs	
Name of Divisioni Forest Geneticstand Tree Breeding	Duration: 5 years (2010-2013)	
Long term objectives of the project		
• The selfect them of steelf (s)tilices the mation Alolpuford Re soltand	nc∢SIAR))udenstandih/gagepathway that o	confers the resistance to a plant.
 To standardize the state of plant growth for application of S Short term objectives of the project To standardize the most optimum dosage / rates of SAR co 	SAR compound/agent pmpound/agent	
 To identify halophytine baicable abrodative application bid psi 	R compound/agent	
 To select mechanican enfangilismandaged and witheat that 	arers tripgensed under salt stress.	
• To design primers for selected gene(s)		
Comments soft Referee expression pattern (up-regulation, down-regulation) using RT-PCR approach on plants grown hydroponically under		
different sets of salt regimes. PI should increase the manpower since investigations require sample studies at IGNP area simultaneously at laboratories. Therefore, one JRF and • To carry out gene expression pattern analysis.		
Comments of Referee The investigating team should be formed of the personnel that will target finding solutions for the exclusive problem of stem canker, specially		
Referee I: motions acquired resistance. The time frame also needs a relook, considering that rohida is a perennial plant with relatively slow pace of growth • Very important research problem		
• Project duration is short Comments of RAG Referee II:		
TRojecture in the plane of the		
munation the study war experiments. Budget should be revised as discussed in RAG. RAG recommended the project for approval of RPC. PI has questioned the use of Arabidopsis.		
Comments of RAG		
The problem of high solinity is an intense one in Rajasthan and G	Juiarat and the area under saline region	is vast so the PI was advised to expand

The problem of high salinity is an intense one in Rajasthan and Gujarat and the area under saline region is vast, so the PI was advised to expand the study area and not just confine to Sambhar lake saline belt only. Arabidopsis can be used as a model plant (as genome is sequenced) as suggested by the PI and was advised to carry out the proposed survey in such a manner that the halophytic species from cruciferae family be selected having some economic importance. It was also suggested that the duration of the project may be increased and the budget may be revised

accordingly

*Equipments and Lab renovation proposed in the project proposal if approved under ICFRE one time grant will reduce the project cost to Rs. **28.6 Lakh**

Project No. 7

Project title: Evaluation of antioxidant activity of arid zone species for their potential as nutraceuticals. Average Index Score : 580.0		
Name of the I	PI Dr. Mala Rathore Scientist _D	Budget · Bs 35.90 lakhs

Name of the Fit. Di. Maia Ratione, beforest D	buget . Rs. 55.76 lakits
Name of Division: Non Wood Forest Products	Duration: 3 years (2010-2013)

Long term objectives of the project : Availability of nutraceutical products based on antioxidants.

Short term objectives of the project : To evaluate antioxidant activity in plants of arid zone.

Determination of antioxidant components viz. vitamins, selenium, polyphenols etc.

Preparation of antioxidant rich extracts and their comparison with commercial antioxidants.

Comments of Referee : Appropriate title suggested` Evaluation of antioxidant activity of selected plants of arid zone for their potential as

nutraceuticals, Short term objectives 1 & 2 are more or less same

Besides vitamins, minerals, carotenoids other products such as phenolic compounds, glycosides, polysaccharides and saponins may be detected, isolated and properties., Latest techniques of extraction microwave assisted extraction, supercritical fluid extraction and of separation of active constituents by flash chromatography should be used to get maximum yield of active constituents

More manpower may be needed to complete the proposed project in time.

Comments of RAG

Sh U.M. Sahai said that time of 3 years is sufficient for the project. Director further commented that outsourcing for few chemical analysis could be done. Include all the species of Ber like. *Ziziphus jujub, Ziziphus mauritiana, Ziziphus nummularia*. Budget should be revised as per time schedule. RAG recommended the project for approval of RPC.

Project 8.

Project Bale: Dependency, evaluation and selection of efficient strains of *Arbuscular Mycorrhizal* fungi for *Acacia nilotica* (L.) Willd. Ex Del. In Rajasthan.

Average Index Score :566.58

Name of the P.I.: Dr. Neelam Verma, R.O.	Budget : Rs.12.75 lakhs
Name of Division: Forest Protection	Duration : 3 years (2010-2013)

Long term objectives of the project : nil

Short term objectives of the project

- To identify AM fungi associated with Acacia nilotica and Ailanthus excelsa plantations at various sites of western Rajasthan
- To study the population of AM fungi in nursery and natural plantations
- To prepare & multiply indigenous AM fungi inoculum
- To select most efficient AM fungi for Acacia nilotica and Ailanthus excelsa planting stock material & to standardize the doze of inoculum
- To lay out field trials, to demonstrate the impact of biofertilizers on A. nilotica and Ailanthus excelsa
- Training on VAM technology to disseminate the knowledge to end users

Comments of Referee

Some <u>recent references on mycorrhizal</u> relationship of Indian Arid Zone plants should be included. All the objectives of the proposed research project can be achieved by the methodology suggested by the investigator group. However, <u>percentage of root colonization</u> should be calculated following the method of Gridline intersect.

Comments of RAG

Change the title as suggested by removeing the dependency word from the title. RAG suggested to include few more species like Acacia nilotica indica, Acacia nilotica cupressiformis and Ailanthus excelsa. RAG recommended the project for approval of RPC.

Project title: Role of forest exotic plant species in biodiversity, rehabilitation of degraded community lands and as a source of livelihood for people in Rajasthan state.

Average Index Score :565.78

Project No. 10. Smt. Seema Kumar, Scientist C	Budget : Rs. 10.68 lakhs
Name of Division: Agro Forestry and Extension	Duration: 3 years (2010- 2013)

Long term objectives of the project :

• To study the role of forest exotic species on biodiversity and develop effective strategies for linking people with exotic plant species for livelihood and health.

Short term objectives of the project

- Inventorization of forest exotic species in different agro-climatic zones of Rajasthan.
- To study the dependent / associated faunal diversity and their economic status.
- To identify exotic species suitable for rehabilitation of degraded community lands.
- Documentation of traditional knowledge on forest exotic species if any.
- To develop strategies for utilization of forest exotic species as source of livelihood.

Development of awareness material such as informative brochures, booklets, etc.

Comments of Referee

Consult Pandey & Parmar 1992 for selection of suitable exotic tree species.

Applied research is important but development is not important -As species selected generally covered under eradication programme on account of threat to native species. Scientific Merit is adequate as there is no long term objective. Methods and Approach Low as it does not cover rehabilitation programme and associated objectives of livelihood.

More emphasis to be given on tree species instead of annual & troublesome weeds: Imperata cylindrica & Mikania micrantha.

Comments of RAG

The house recommended the proposal by suggesting change in the title as suggested because the project proposal is not aiming at conservation, so

remove conservation word from the title. Change the objectives accordingly. Study area should be specified. Include P. juliflora and Acacia

tortilis.

Project title: Assessment of floral diversity influenced by different land uses along Narmada canal in Western Rajasthan		
	Average Index Score :555.79	
Name of the P.I. Dr. Abha Rani	Budget : Rs. 7.5 lakhs	
Project No. 11.	-	
Project title: some assessment of adoption and implementation	of Joint Forest Management Programme, its sustainability and role in	
Long term object wesalfundiftment in Gujarat.		
	Average Index Score :402.89	
• To utilize the data in future impact assessment in the area		
Short term objectives of the project		
• To assess plant biodiversity along Narmada Canal.		
• To monitor nutrient status of the soil.		
Comments of Referee		
Selection of site on what basis. Can the vegetation ecology observations with Simpson, Shannon –Weaver and richness computation lead to quantifying biodiversity.		

Comments of RAG

Project title and objective is mismatched. Title say only evaluation of present assessment. Objectives does not explain the reason to asses the biodiversity. Methodology does not suggest the comparison. Sh Pankaj Agarwal said that 4 year is a long period of making assessment of vegetation. Project period may be reduced from 4 years to two years and revised the budget. Need of equipment should be assessed by the director. Dr Faroda suggested to study the available flora in the Ist year. Protection of the area should be taken care. RAG recommended the project for approval of RPC

Name of the P.I. Dr. Sunil Kumar, Scientist-E	Budget : Rs. 11.12 lakhs
Name of Division:	Duration: 3 years (2010-2013)

Long term objectives of the project :

- To assess the economic benefits of JFM to the rural masses- increase in the production of NTFP, grasses, small timber, medicinal plants etc.
- To assess the social impact and benefits occurred after the implementation of JFM
- To assess the increase in awareness for forest, wild life and environment in effective participation in JFM and other protection activities.
- To assess the sustainability of JFM programme in the selected areas.
- To assess th effect of FDA's and entry point activities carried out and funds allotted to various projects in JFM's
- Development, listing and testing Criteria & Indicators for well-being of people for sustainable forest management in the Indian context for JFMC in Gujarat.

Comments of Referee

The outcome of the study will aid to knowledge on a theme which is very important on present day scenario, where conflict between stakeholders

and state has been surfacing every where in the country as far as forestry programme are concerned.

Different role of different actors in JFM areas should also viewed in context of various conflicts and these conflicts should be clearly spelt out in

reports. It will give insight to planners to develop policies accordingly for the benefit of stakeholders

Comments of RAG

RAG members commented that the project is not focused properly. Colloborations should be made with SFD's, Panchayati Raj and NREGA. The project should be revised before putting it for approval of RPC.

Himalayan Forest Research Institute, Shimla

Project No.1		
Project title : Survey and Bio-ecology of potential insect-pests an	d pathogens of cone and seeds of Pinus gerardiana Wall.	
	Average Index Score : 808.13	
Name of the P.I.: Dr. Pawan Kumar, Scientist B	Budget : Rs.12.43 lakh	
Name of Division: Forest Protection	Duration : 3 Years	
Objectives of the Project		
• Impact study in containing the infestation of cone borer in Ch	nilgoza by light trap and pheromone trap.	
• Devising methods to protect the stored seeds from the borer a	uttack	
• Studies on storage treatments and moisture contents in contai	ning the insect and pathogens attack.	
• Studies on safer chemicals treatments for the control of insec	t pests and pathogens of the stored seeds.	
• Developing of management strategy for borers and pathogen	s of cone and seeds of Chilgoza pine.	
Comments of Referee:		
• The present project is a sequel to the earlier proposal, which was approved by IX th Research Policy Committee (RPC) of ICFRE, Dehradun for two years i.e. upto March. 2010		
• The first phase is complete and the proposed objectives are now to be taken in the second phase.		
• Accordingly, the comments of the referees were not sought this time since, they have already given their comments, and those were sent to headquarters during IX th RPC Meeting.		
RAG Comments:		
• Control measures for myco-flora infecting chilgoza pines seeds during storage to be developed.		
• Mode and the rate of infection to be studied.		
• Quantification of infection for better details and outcome of the study to be done.		
• Cultural practices to be included in the management part of the study.		
• PI to modify / restructure project proposal keeping in view the suggestions of the Hon'ble members of RAG.		

Project No.2

Project title : Carbon sequestration through traditional land use and future potentials in Lahaul and Spiti Valleys, Himachal Pradesh		
	Average Index Score : 794.32	
Name of the P.I.: Dr. K.S. Kapoor, Scientist F	Budget : Rs.47.30 lakh	
Name of Division: Ecology and Biodiversity Conservation	Duration: 5 Years	
Long term objectives of the project		
• To prepare database for establishing climate change mitigation potential of different land use management system and also to develop carbon inventory for the study area.		

Short term objectives of the project

- To determine net CO₂ fixation by soil plant systems from land use as a function of management practices.
- To establish climate change mitigation potential for different land use / management systems.
- To develop carbon inventory for the study area.
- Suggest land use models to increase carbon sequestration.

Comments of Referee:

Referee-I:

- The proposal is quite useful and important from applied research point of view. As far as developmental angle of the project is concerned, the study will enable the organization to draw future strategy for increasing carbon stocks in the cold desert areas.
- Before initiating the study, the PI must keep in mind the following;
 - Portable photosynthetic meter for generating realistic data to be included in the proposal.
 - Two JRFs to be appointed, keeping in view the extent of area of the cold deserts.
 - Project should be atleast for five years.

Literature search: Very good.

Objectives rating for applied research: Important

Objectives rating for Development: Very Important.

Scientific merit: Very Good.

Methods and approach: High.

Project Action Plan/ Design: Clear.

Manpower requirement: Two JRFs

Time Requirements: Five years.

Budget Requested: Well estimated.

Suggestions for improvement:

The proposal is quite relevant however, one more objectives as per the comments on the proposal can be included.

Referee-II:

- The project proposal is highly relevant to the region as proposed under the project. Besides, the area is already vegetation starved and developmental activities occurring at faster rate in the region are enhancing GHG emissions.
- Before initiating the study, the PI must keep in mind the following;
 - Two JRFs and One Field Assistant to be included in the manpower.
 - TA to be revised because of enhance rate etc.

Literature search: Very good.

Objectives rating for applied research: Very Important

Objectives rating for Development: Very Important.

- Scientific merit: Very Good.
- Methods and approach: High.

Project Action Plan/ Design: Clear.

Manpower requirement: Two JRFs & One Field Assistant

Time Requirements: OK.

Budget Requested: Require some changes.

Suggestions for improvement: The proposed studies in fact are an emerging area and will help in developing carbon sequestration models for arid regions. Besides, progressive studies on carbon stocks can always be assessed and new multi-purpose species can also be included.

RAG Comments:

- Concentrate only on one part of the district for drawing more logical conclusions.
- Specific and suitable tools need to be tried while finalizing the study sites.
- Satellite imageries for the area can be taken as a tool.
- Watershed approach to be followed for accomplishment of this study.

PI to modify / restructure project proposal keeping in view the suggestions of the Hon'ble members of RAG.

Project title : Development of baseline Data on ecologically important Scolytid-Beetles for assessing the futuristic effect of climate change in Himachal Pradesh

Average Index Score : 642.62

Name of the P.I.: Dr. Ranjeet Singh, Scientist E	Budget : Rs.35.52 lakh
Name of Division: Forest Protection	Duration : 5 Years

Long term objectives of the project

• Development of a base line data on the dynamics of these scolytid beetles in relation to climatic factors and prepare the strategy to manage them in the forest.

Short term objectives of the project

- To carry out spatial and temporal surveys to study the distribution and abundance of scolytids like Ips longifolia Steb., Pityogenes scitus Bladfd. And other such species.
- To study the population dynamics in relation to the natural enemies complex and meteorogical factors.

Comments of Referee:

Referee-I:

- The research proposal as conceived is very good.
- Literature search: Very good.
- **Objectives rating for applied research:** Very Important
- **Objectives rating for Development:** Very Important.
- Scientific merit: Excellent.
- Methods and approach: High.
- Project Action Plan/ Design: Clear.
- Manpower requirement: Sufficient.
- Time Requirements: A good estimate.
- Budget Requested: Well estimated.

Suggestions for improvement:

The proposal is very good however, some part of the budget i.e. at least 10% must be kept for taxonomic identification or experts.

Referee-II:

Literature search: Very good.

The work of Beeson should be taken as base for pursuance of present studies. However, lot of taxonomic changes have taken place since his times. **Objectives rating for applied research:** Very Important

Objectives rating for Development: Important and well defined. However, first and foremost job is the listing out of scolytid fauna followed by undertaking the studies for population dynamics in relation to biotic & abiotic factors.

Scientific merit: Very Good.

The data generated can be utilized for preparing the prediction models.

Methods and approach: High.

However, periodicity of recording the population dynamics and procedures followed should be well defined.

Project Action Plan/ Design: Clear.

Manpower requirement: Sufficient.

Time Requirements: A good estimate. However, studies on borer complex (Coleopteran) should be made a long term project in view of their significance in forest eco-system.

Budget Requested: Well estimated.

Suggestions for improvement:

PI may incorporate the suggestion as detailed in each part of the comment.

RAG Comments

- Title of the project requires change.
- Study sites need to be selected preferably nearer to the meteorological stations.
- Sample size of tress need to be defined / taken into consideration.
- Stratification of the forest areas for taking the samples need to standardised.
- Take the services of a forest pathologist.
- Concentrate on one species having most damaging effect on the forests.
- Include feeding habit in the study as host specificity is essentially required to be looked into.
- More literature survey input.
- PI to modify / restructure project proposal keeping in view the suggestions of the Hon'ble members of RAG.

Project No.4

Project title : Predatory efficiency of Stegodyphus Sarasinorum (Arachnida:Aranneae:Eresidae) against insect pests of plants in the Forest Nursery.

Average Index Score : 594.27

Name of the P.I.: Dr. S. Chakrabarti, Scientist E	Budget : Rs.12.56 lakh
Name of Division: Forest Protection	Duration : 3 Years

Objectives of the Project

- Identifying the prey-spectrum of the spider in natural habitat.
- Determination of predatory efficiency and its effectiveness as a bio-control agent in forest-nurseries.
- Designing a model for mounting bio-control devices using colony of social spider.

Comments of Referee

Referee-I:

• The research proposal as conceived is very good.

Literature search:

More references regarding efficiency of *Stegodyphus* sp. against insect pests should be added.

Objectives rating for applied research: Very Important

Objectives rating for Development: Important.

Scientific merit: Good.

Methods and approach: High.

For studying the efficiency of the social-spider, it is important to design and construct sub structure in the nursery.

Project Action Plan/ Design: Clear.

Manpower requirement: Sufficient.

Time Requirements: A good estimate.

Budget Requested: Well estimated.

Suggestions for improvement:

Project designed is very good. Emphasis should be given on mass rearing of social spider and then its release in forest nurseries.

Referee-II:Literature search:Very good.However, more references on social spider need to be added.Objectives rating for applied research:ImportantObjectives rating for Development:Very Important.Scientific merit:Excellent.Methods and approach:High.Project Action Plan/ Design:Clear.Manpower requirement:Sufficient.Time Requirements:Three years are too short.Budget Requested:Well estimated.Suggestions for improvement:More references to be added.

RAG Comments

- Importance of such social spider in forest nurseries need to be highlighted and weaved into the project.
- Natural occurrence of the social spiders around and the control mechanism in nurseries also need to be highlighted / studied.
- Database of spiders as bio-control agents to be developed.
- The prey spectrum of the social spider in the nature.

PI to modify / restructure project proposal keeping in view the suggestions of the Hon'ble members of RAG

Tropical Forest Research Institute, Jabalpur

Project No.1.			
Project title: Damage assessment of gall making insect species of eucalypts and its management by pesticides.			
	Average Index Score : 739.77		
Name of the P.I. Dr N. Roychoudhury Scientist –'E'	Budget : Rs. 10.06 lakhs		
Name of Division: Forest Entomology Division	Duration : 3 years		
Long term objectives of the project			
To develop management practices for control of gall making insect species of eucalypts.			
Short term objectives of the project			
To undertake periodical survey for collection and identification of natural enemies of gall insect and their habitat.			
Comments of Referee			
The methodology lacks objectivity and focus. Survey areas and methodology not clearly defined. Madhya Pradesh has over half a million ha of eucalypt plantations it should have been possible to develop a survey plan for identification of the insects and assessment of their pest status. The work should focus on the key insect pest only. Three years project period is more justifiable.			
More appropriate project title would be" Assessment and management of insect pests of eucalypts in Madhya Pradesh with special emphasis on			
the alien invasive eulophid".			
Comments of RAG			
The house recommended the proposal by suggesting more attention on control measures for gall forming insect of Eucalyptus besides studies on			

their activity period. Native predator/parasitoids of the pest may also be studies. The title of the project needs to be changed accordingly

Project No.2. Project title: Development of multitier cropping (Silvi-Agri-Spice) system.		
Name of the P.I.: Dr N. Berry Scientist C	Budget : Rs. 15.07 lakhs	
Name of Division: Agroforestry	Duration: 5 years	
Long term objectives of the project		
• To develop high value cropping system for income generation.		
Short term objectives of the project		
 To develop aonla based multitier cropping (Silvi-Agri-spice) system. To study the effect of Aonla on growth and yield of intercrops and vice-versa. To transfer the development technology to the user groups. 		
Comments of Referee:		
• The proposal could be accepted after including economics and other ecological parameters in an aonla-crop ginger model. At least two variety of aonla e.g. NA7, NA8 or NA10 should be added in the proposal for better pollination.		
Summary of RAG Comments (if any)		
• The RAG recommended the project by suggesting incorporation of few more tuber crops in the study. Pruning is generally not evocated in fruit bearing trees like aonla. The schedule may be modified in view of the requirement of shade.		
Project title: Studies on larval parasitoids, *Apanteles* spp. (Hymenoptera : Braconidae) of major defoliators of teak and sal forests of Orissa.

Average Index Score : 710.54

Name of the P.I. Mohd. Yousuf, Scientist-E	Budget : Rs. 9.51 lakhs
Name of Division: Forest Entomology Division	Duration: 3 years
Long term objectives of the project	
 To investigate the potential larval parasitoids of key insect pess Short term objectives of the project Collection of samples for emergence of <i>Apanteles</i> spp. To observe natural incidence of different species of <i>Apanteles</i> To study biology of important species of <i>Apanteles</i>. 	ets of teak and sal.
To conduct laboratory tests of <i>Apanteles</i> against key pests of	f teak and sal.
Comments of Referee	
Methodology need to be elaborated. Over all, the project is Very good.	
Summary of RAG Comments (if any)	
The house recommended the proposal with slight change in the first o	bjective of the project.

Project No.4.	
Project title: Development of certification criteria and production of microbial inoculants for application in forest nurseries and	
plantations.	Average Index Seene + 685.02
Name of the PL Dr PK Verma Scientist, 'D'	Rudget · Rs 12.89 lakhs
Name of Division: Forest Pathology	Durget . KS. 12.09 lakits
Long term objectives of the preject	Duration. 4 years
Long term objectives of the project	
• Application of biofertilizers to enhance forest producti	wity.
Short term objectives of the project	
• To develop products(inocula) and criteria for certificat	tion of microbial inoculants for application in important tree species.
• To tests the role of bio-fertilizers on lesser researched	tree species, like mahua, beeja-sal, bel, tinsa, etc.
• Field application of bio-fertilizers in problematic soil.	
Comments of Referee : Proposal appreciated by the reviewer	r.
Comments of RAG : The proposal is recommended.	
Project No.5.	
Project title: Counterbalancing the detrimental effect of S	Sponge Iron Factory- emitted Particulate Matters (SIFPM) with the protective
effect of Vesicular Arbuscular Mycorrhiza	a (VAM) on the growth of seedlings of important tree species.
	Average Index Score : 679.59
Name of the P.I.: Dr Rupnarayan Sett Scientist C	Budget : Rs.7.48 lakhs
Name of Division: Ecology,	Duration : 2 years
Long term objectives of the project	
• To assess if VAM can used as an effective eco-friendly vegetation.	ly ameliorating agent against the detrimental effect of particular matters (SIFPM) on

Short term objectives of the project

• To determine the neturalizing effect of VAM against the inhibitory effect of PM on growth of seedlings of important tree species.

Comments of Referee

The proposal is upto the mark and for better growth of tree seedlings in air polluted areas and recommended to accept.

Comments of RAG

RAG recommended the proposal with suggestions to finding out of causative toxic components of waste and inclusion of the reference of Juwarkar and Jambhulkar (2008) who carried out similar work at Nagpur.

Project No.6.		
Project title: Integrated management of vascular wilt disease of Azadiracta indica (Neem), Emblica officinals (Aonla) and Gmelina arborea		
(Khamer) in forest nurseries.		
	Average Index Score : 646.08	
Name of the P.I.: Dr. K.K. Soni Scientist-D	Budget : Rs.5.15 lakhs	
Name of Division: Forest Pathology	Duration : 3 years	
Long term objectives of the project		
• To develop integrated management plan for control of vascular wilt disease.		
Short term objectives of the project		
• To study incidence and epidemiology of vascular wilt causi	ng pathogen in forest nurseries.	
• To develop suitable microbial consortium and combination	of cultural practices for control of wilt disease in forest nurseries	
Comments of Referee		
Some references on bio-control using <i>Trichoaerma</i> spp., <i>Baculu</i>	s subtils and Pseudomonas fluorescens may be added and use of rhizoblum	
which has no role in bio-control may be avoided.		
Comments of RAG: RAG recommended the proposal		

Project No.7.		
Project title: Studies on root rot and stem decay diseases in Aca	cia catechu and their control.	
	Average Index Score : 643.25	
Name of the P.I.: Dr. R.K. Verma	Budget : Rs. 6.45 lakhs	
Name of Division: Forest Pathology	Duration: 3 Years	
Long term objectives of the project		
• To minimize incidence of losses due to disease and decays in Acacia catechu. Short term objectives of the project		
 To collect, isolate and identify diseases of <i>Acacia catechu</i>. To assess the losses in wood and non wood produces due to diseases in <i>A. catechu</i> and develop their preventive measures. To test suitable biological agent and preservatives for control of decay of wood during storage in laboratory and field. Comments of Referee 		
Some foreign literature should also be reviewed in the project. Detailed methodology and name of bio-agents, fungicides and preservatives needs		
Comments of RAG: The proposal is recommended by the house .		
Project No.8.		

Project title: Germination ecophysiology of two important tropical forest tree species *Scheleichera oleosa* and and *Pterocarpus marsupium* Average Index Score : 642.16

Name of the P.I. Dr Maitreyee kundu	Budget : Rs 11.11 lakhs
Name of Division: Silviculture	Duration : 3 years
Long term objectives of the project	

• Revelation of the role of physiology and environment on germination of seeds for regeneration in natural condition

Short term objectives of the project

- To determine the range of physical factors for germination under controlled conditions
- To find out the role of edaphic factors on germination
- To survey the effect of seed maturity, longevity and dormancy in establishment.

Comments of Referee

The dormancy breaking chemicals needs to be chosen carefully. The digestion and distillation units may not be required.

Comments of RAG: The house recommended the proposal with suggestions to include detailed literature on the target species.

Project No.9.

Project title: Anthropogenic influence and effect of invasive species on phyto-diversity of Sanjay National park(M.P)

Average Index Score : 631.88

Name of the P.I.: Shri P.K. Khatri, Scientist-C	Budget: Rs. 7.81 lakhs
Name of Division: Biodiversity and Sustainable Management	Duration: 3 years
Long term objectives of the project	

• Assessment and monitoring of phyto-diversity in relation to anthropogenic influence and effect of invasive species.

Short term objectives of the project

- Ecological enumeration of vegetation of the Sanjay National Park.
- To study the regeneration status of major plant species
- To study the anthropogenic impact on vegetation
- Documentation and distribution of plant invasive species and it's impact.

Comments of Referee

Standard methodologies have been proposed by PI to quantify the study. A few references have been quoted for the information of PI. Including genetic diversity of the endemic species and also basic biodiversity including its distribution in whole project area and its impact on regeneration will be better. **Comments of RAG:** Recommended with changes. the word regeneration potential in 2nd objective to "regenera- tion status" and removal of 3rd objective, which does not commensu- rate with the title of the project . Further, the budget given is at lower level if GIS mapping is done.

Project No.10.

Project title: Studies on variations with respect to *in vitro* azadirachtin production in selected high yielding populations of *Azadirachia indica* A. Juss.

Average Index Score : 626.60

Name of the P.I.: Dr. Fatima Shirin Scientist D	Budget : Rs11.61 lakhs
Name of Division: Genetics & Plant Propagation	Duration : 3 years

Long term objectives of the project

• To select populations of neem yielding high azadirachtin content under in vitro conditions.

Short term objectives of the project

- To study the variation with respect to azadirachtin production in original in vivo population and their in vitro cultures.
- To screen high yielding callus cultures with respect to azadirachtin production.

Comments of Referee

It will be an interesting study in finding out potentiality of different tissues of neem for production of azadiractin. Long term objectives may not be achieved with this approach hence need slight modification.

Comments of RAG : The project proposal is recommended by the house.

Project No.11.

Project title: Development of plantation technology of lesser known tree species (Strychnos nux-vomica and *Sterculia* urens) with emphasis on plantation on refractory sites (Eco-restoration of degraded land with lesser known tree species).

Average Index Score : 624.38

Name of the P.I. S.D. Sonkar Scientist –F	Budget : Rs. 3.30 lakhs
Name of Division: Silviculture	Duration: 4 years

Long term objectives of the Project

• To encourage foreign trade of the seeds of *Strychnos nux-vomica* and *Sterculia urens*.

Short term objectives of the project

• To develop a suitable plantation model for enhancing survival and growth of Strychnos nux-vomica and Sterculia urens on refractory site.

Comments of Referee: PI should worked out cost structure for field applicability. The study will improve the current status of plantation technique.

Comments of RAG: The RAG recommended without any suggestion.

Project No.12.

Project title: Biological control of insect pests of medicinal plants *Abelmoschus moschatus*, *Gloriosa superba* and *Withania somnifera* Average Index Score : 621.58

Name of the P.I. Dr P.B. Meshram, Scientist-E	Budget : Rs. 11.69 lakhs
Name of Division: Forest Entomology	Duration : 4 years

Long term objectives of the project

• To develop bio-control measure for the management of insect pests or target species of medicinal plants.

Short term objectives of the project

- To identify the key insect pests of medicinal plants selected for the present study and their management by using parasitoids, predastor and bio-pesticides.
- To disseminate the technique of biological control to the user groups.

Comments of Referee

It is suggested that key pests of each crop may first be identified during 1st year and the attention should be focused on them only. Different species of *Trichogramma* should be tested.

Research plan is too general and details are not worked out adequately.

Comments of RAG: RAG recommended the proposal with suggestion to specify the equipments required and elaborate methodology.

Project No.13.

Project title: Evaluation of storage potential for prediction of storage life of three tropical forest seeds: Saraca indica, Pterocarpus	
Marsupium and Bridelia retusa.	Average Index Score : 613.47
Name of the P.I. Dr Maitreyee Kundu	Budget : Rs. 9.6 lakhs
Name of Division: Silviculture	Duration : 4 years

Long term objectives of the project

• To study the storage behavior of different seeds for *ex-situ* genetic conservation and prediction of viability at wide range of environment conditions.

Short term objectives of the project

- To evaluate the storage behavior of seed
- To develop the protocol for proper storage
- To quantify the factors affecting seed longevity
- To relate the water potential with the seed constituents affecting viability

Comments of Referee

Change in the experiments is needed to achieve the objectives. Number of tree species may be reduced for an in depth study.

Comments of RAG: Keeping academic and conservation purposes of seeds, the proposal is recommended by reducing budget under the head equipment.

Average Index Score : 605.77

Project No.14. Project title: Integrated nutrient management for improved growth of trees on overburden dumps. Name of the P.I. Dr A.C. Surya Prabha, Scientist C Budget : Rs. 7.75 lakhs Name of Division: CFRHRD Chhindwara Duration: 4 years Long term objectives of the project • To reclaim the over burden dumps through intergrated nutrient management. Short term objectives of the project • Short term objectives of the project

• To elucidate information on the effect of integrated nutrients management on growth and nutrients status of tree species.

Comments of Referee

Out of 6 selected species for plantations to restore the over-burden, at least 3-4 native key stone species growing in the nearby forest should also be selected to start the succession.

Comments of RAG: The house recommended the proposal by removing objective "characterization coal mine over burden dump for its physical & chemical properties" and justification & name of equipments in the budget estimate.

Project No.15.

Project title: Evaluation of *Diospyros melanoxylon* (Tendu) and *Carissa carandas* (karonda) fruits for their nutritional value and development of value added products for economic development of local people.

Average Index Score : 556.76

	8
Name of the P.I.: Dr S.C. Biswas	Budget : Rs.6.06 Lakhs
Name of Division: NFWP	Duration : 3 Years
I and tame abjectives of the project	

Long term objectives of the project

• To develop value added products from forest fruits for economic development & poverty alleviation

Short term objectives of the project

- Evaluation of Diospyros melanoxylon (Tendu) and Carissa carandas (karonda) fruits for their nutritional constituents.
- To prepare value added products .
- To estimate nutritional status and physio-chemical properties of value added products.

Comments of Referee

Excellent proposal. Characterization suggested.

Comments of RAG: The title should be specific by including the name of two selected species. The proposal is recommended by the house.

Project No.16.

Project title: Influence of forest canopy cover on ground flora and micro-climate in westernghats (Maharashtra).

Average Index Score : 551.29

Name of the P.I.: Dr. Avinash Jain, Scientist D	Budget : Rs. 10.48 lakhs
Name of Division: Ecology & Rehabilitation Division.	Duration: 2 Years

Long term objectives of the project

• To study interactions among forest canopy cover, under storey vegetation and atmosphere for phytodiversity conservation.

Short term objectives of the project

- To observe the effect of changing canopy structure and density on regeneration and growth of ground flora including native and alien species.
- To study carbon and water exchange of canopies with atomosphere.
- To study edaphic and micro-climate parameters with changing canopy patterns.

Comments of Referee

The literature review is scarcely explored. There is no reference indicating the relation of canopy structure and density with ground flora.

Comments of RAG: Recommended with change in title specific to the study and adding review of literature and methodology of canopy measurement in the project document.

Project No. 17.

Project title: Documentation and distribution of Forest Invasive Species (FIS) of Jabalpur, Katni, Mandla and Seoni districts of Madhya Pradesh. Average Index Score : 536.95

Name of the P.I. Dr V. Nath Scientist-F	Budget : Rs. 7.66 lakhs
Name of Division: Biodiversity and Sustainable Management	Duration : 3 years

Long term objectives of the project

• Documentation of forest invasive species in natural ecosystem for setting the International Standards for phyto-sanitary measures. Short term objectives of the project

- Ecological enumeration of vegetation
- Documentation and identification of Forest Invasive Species
- Study the density, distribution pattern and phonological behaviour of Forest Invasive Species(FIS)
- To create awareness about FIS and management strategy against invasive species.

Comments of Referee - No comment on the project.

Summary of RAG Comments (if any): The information is already available with forest department; the PI should work how to combat with

these species. Forest types and topography in respect of population study and methodology to assess variation in population density should be

made clear. The project is recommended after improvement as suggested.

Project No.18.		
Project title: Vegetational and hydrological attributes of waters	hed in Jabalpur and Seoni of M.P.	
	Average Index Score : 187.92	
Name of the P.I.: Dr. A.K. Bhowmik Scientist B	Budget : Rs.7.91 lakhs	
Name of Division: Ecology	Duration : 3 years	
Long term objectives of the project		
• Study of vegetational and hydrological attributes		
Short term objectives of the project		
 To assess the structural features, biodiversity & distribution pattern of the vegetation in the watershed. To assess the vegetation pattern of tree species in forests To study the hydrological attributes of the vegetation. To develop land use land cover map of the study area. To suggest strategies for effective conservation of soil moisture and floral diversity in watershed area. Comments of Referee : The referee suggested to change in title and in methodology, etc 		
Comments of RAG: The objectives cannot be achieved in the stipulated time and the proposal is not properly drafted and hence not recommended.		

Project No.1		
Project title: Screening of oil of <i>Pongamia pinnata</i> Linn., <i>Jatropha curcus</i> Linn. and extractives of <i>Acacia auriculiformis</i> A.Cunn., <i>Acacia nilotica</i> Benth. and <i>Lantana camara</i> Linn. for developing eco-friendly wood preservatives.		
Average Index Score : 723.7		
Name of the P.I.: Mrs. D. Venmalar, Scientist –B	Budget : Rs. 20.21 Lakhs	
Name of Division: Wood Seasoning & Preservation	Duration : 5 years (2010-2015)	
Long term objectives of the project •Recommend to use eco-friendly	preservative, to increase the service life of timber.	
 Short term objectives of the project To study the efficacy of <i>Pongamia pinnata</i> Linn. Oil and <i>Jatropha curcas</i> Linn. Oil and <i>Simarouba glauca</i>. D.C. as wood preservatives. To incorporate less toxic inorganic salts and metal oxides to the oil to enhance the biocidal activity. To develop treatment methods to impregnate the formulated wood preservatives in to the wood To study the efficacy of the formulated preservatives against insects, borers and fungi in the laboratory and in the field conditions. 		
Comments of Referee: Referee 1: •Development of less toxic ecofriendly preservatives of non inorganic constituents offers excellent opportunity for wood preservation research		
and this may eventually replace boric preservatives such as CCA, CCE	B etc in the near future.	
•Some of the plants which produces natural pyrithrins eg. Chyrsanthemum etc may also be undertaken for studies.		
Referee 2:		
Methodology: After achieving the objectives, extension work has to be carried out so that the results of the laboratory studies should or can reach to the industry so that consumer will get the benefit.		
Comments of RAG : PI to discuss with Director/GCR and decide whether two projects – one on oil extracts and one on plant extracts is to be		
proposed(The PI had proposed a single project in the RAG entitled "Screening of oil of <i>Pongamia pinnata</i> Linn., <i>Jatropha curcus</i> Linn and extractives of <i>Acacia auriculiformis A. Cunn, Acacia nilotica</i> Benth and <i>Lantana camara</i> Linn for developing eco-friendly wood preservatives. The RAG asked the PI to propose two projects one on oil extracts and other on plant extracts. Accordingly the PI has proposed two separate projects one on oil extracts). Hence, the average index score will remain same for both projects.		

Project title: Screening of certain plant extractives for developing eco-friendly wood preservatives.

Average Index Score : 723.7

Name of the P.I.: Mrs. D. Venmalar, Scientist –B	Budget : Rs. 11.00 Lakhs
Name of Division: Wood Seasoning & Preservation	Duration : 5 years (2010-2015)

Long term objectives of the project

• •Recommend to use eco-friendly preservative, to increase the service life of timber.

Short term objectives of the project

- To study the efficacy of the extracts of Acacia auriculiformis, Acacia nilotica, Lantana camara, Gliricidia sepium, Chromolaena odorata, Vitex negunda, Adathoda zeylanica vasica and Cassia angustifolia as wood preservatives.
- •To incorporate less toxic inorganic salts and metal oxides to the oil and plant extracts to enhance the biocidal activity.
- •To develop treatment methods to impregnate and formulated wood preservatives in to the wood.

•To study the efficacy of the formulated preservatives against insects, borers and fungi in the laboratory and in the field conditions.

Comments of Referee

Referee 1:

•Development of less toxic ecofriendly preservatives of non inorganic constituents offers excellent opportunity for wood preservation research and this may eventually replace boric preservatives such as CCA, CCB etc in the near future.

•Some of the plants which produces natural pyrithrins eg. Chyrsanthemum etc may also be undertaken for studies.

Referee 2:

•Methodology: After achieving the objectives, extension work has to be carried out so that the results of the laboratory studies should or can reach to the industry so that consumer will get the benefit. The proposal has been rated as "very good"

Comments of RAG:

PI to discuss with Director/GCR and decide whether two projects – one on oil extracts and one on plant extracts is to be proposed (The PI had proposed a single project in the RAG entitled "Screening of oil of *Pongamia pinnata* Linn., *Jatropha curcus* Linn and extractives of *Acacia auriculiformis A. Cunn, Acacia nilotica* Benth and *Lantana camara* Linn for developing eco-friendly wood preservatives. The RAG asked the PI to propose two projects one on oil extracts and other on plant extracts. Accordingly the PI has proposed two separate projects one on oil extracts and another on plant extracts). Hence, the average index score will remain same for both projects.

Project No.3		
Project title: Utilization of Bambusa bambos (L.) and Dendrocalamus strictus (Roxb.) as an alternative of wooden dunnage pallets.		
Average Index Score :721.58		
Name of the P.I. Dr. S.K. Sharma Scientist –F	Budget : Rs. 8.74 lakhs	
Name of Division: Wood Properties and Uses	Duration : 3 years (2010-2013)	
Long term objectives of the project		
•To use treated bamboo as an alternative to wooden dunnage pallets.		
Short term objectives of the project •To test treated <i>Bambusa bambos</i> (L.) and <i>Dendrocalamus strictus</i> (Roxb.) as an alternative of wooden dunnage pallets.		
Comments of Referee		
Referee 1:		
Project has been rated as "Very good"		
Referee 2:		
Project has been rated as "Excellent"		
Make sure that the users are ready to accept pallets from bamboo. Please emphasize that bamboo are treated		
Comments of RAG:		
Project approved		

Project No.4	
Project title: Evaluation of wood quality parameters of plantation grown species for suitability in cooling towers.	
Average Index Score : 707.53	
Name of the P.I.: Shri N.C.M. Rajan, Scientist –B	Budget : Rs. 5.10 lakhs
Name of Division, Wood Properties and Uses	Duration: $3 \times 2010(2012)$
Name of Division: wood Properties and Uses	Duration: 5 years (2010-2013)

Long term objectives of the project

•To encourage the use plantation grown timber and recommend the species for rational utilization as a timber.

Short term objectives of the project

- To evaluate wood quality parameters of *Ailanthus excelsa* Roxb. and *Melia dubia* Cav. required for cooling towers by studying physical, mechanical properties and processing including preservative treatment.
- To assess the durability of woods against termites and fungi.
- To evaluate basic chemistry of wood.
- To determine the suitability of Ailanthus excelsa Roxb.and Melia dubia Cav. for cooling towers.

Comments of Referee

Referee 1: Project has been rated as "very good" **Referee 2:** Project has been rated as "very good"

Comments of RAG:

In the RAG, the title of the project was "Evaluation of wood quality parameters of plantation grown tropical *Pinus patula* Schlechdt. Cham and *Pinus caribaea* var. *hondurensis* for suitability in cooling towers and packing cases". However, RAG approved the project subject to the suggestion that instead of single project, the project should be spit into two. The suggested title of the project is "Evaluation of wood quality parameters of plantation grown species for suitability in cooling towers" and "Evaluation of wood quality parameters of plantation grown species for suitability in packing cases". The project cost of both the projects put together should be restricted to Rs. 12 lakhs. The average index score will remain same for both projects.

Project No.5

Project title: Evaluation of wood quality parameters of plantation grown species for suitability in packing cases.

Average Index Score : 707.53	
Name of the P.I.: Dr. S.R. Shukla, Scientist-D	Budget : Rs. 6.31 lakhs
Name of Division: Wood Properties and Uses	Duration: 3 years (2010-2013)

Long term objectives of the project

• To encourage the use plantation grown timber and recommend the species for rational utilization as a timber.

Short term objectives of the project

- To evaluate wood quality parameters of *Melia dubia, Ailanthus excelsa, and Anthocephalus* required for packing cases.
- To develop traditional and reusable wire bound packing cases above wood species.

Comments of Referee Referee 1: Project has been rated as "Very good" Referee 2:

Project has been rated as "very good"

Comments of RAG :

In the RAG, the title of the project was "Evaluation of wood quality parameters of plantation grown tropical *Pinus patula* Schlechdt. Cham and *Pinus caribaea* var. *hondurensis* for suitability in cooling towers and packing cases". However, RAG approved the project subject to the suggestion that instead of single project, the project should be spit into two. The suggested title of the project is "Evaluation of wood quality parameters of plantation grown species for suitability in cooling towers" and "Evaluation of wood quality parameters of plantation grown species for suitability in packing cases". The project cost of both the projects put together should be restricted to Rs. 12 lakhs.

The average index score will remain same for both projects.

Project No.6		
Project title: Study on impact of podu cultivation on Phytodiversity and soil factors in the Eastern Ghats of Andhra Pradesh. Average Index Score : 694.01		
Name of the P.I.: Sh. D.J. Prasad, CFBudget : Rs. 8.12 lakhs		
Name of Division: Ecology (FRC Hyderabad)	Duration: 2 years (2010-2012)	
Long term objectives of the project		
•To assess the impact of podu cultivation on the Phytodiversity of species.		
•To compare the Phytodiversity of the podu cultivated areas with the protected forests.		
Short term objectives of the project		
• To study the regeneration of different species in Podu cultivated areas.		
• To study physical characteristics and chemical composition of the soils in the podu cultivated areas.		
• To study the microflora and microfauna of the soils in "podu" cultivated areas		
Comments of Referee:		
Referee 1:		
Methodology adopted is appropriate and will help in achieving the objectives. Project proposal is rated as "good"		

Referee 2:

The methodology enables the PI to come out with very good picture of after effects of shifting cultivation. Project proposal is rated as "good" **Comments of RAG:**

The project period is to be reduced to 2 years (In the RAG the project period proposed was 3 years). A microbiologist collaborator from Andhra Pradesh Agricultural University is to be included)

(PI has incorporated the RAG suggestions)

Project No. 7		
Project title: Evolution of consumption rates among insect herbivores as a function of intrinsic growth rates of plant resources: A search for patterns among forest pests. Average Index Score : 662.64		
Name of the P.I.: Y.B. Srinivasa, Scientist D	Budget : Rs. 2.65 lakhs	
Name of Division: Wood Biodegradation	Duration : 2 years (2010-2012)	
 Strengthen theoretical foundations for understanding insect-plant interactions with a focus on insects that are successfully able to exploit plant resources and build large populations. Short term objectives of the project To develop mathematical models to explain consumption rates among insect herbivores as a function of growth rates of plant resources. To explain spatial distribution patterns of insect herbivores in relation to the growth rate of plant resources. To examine factors regulating discrete generation cycles among tropical insects. To provide better understanding of insect-plant interactions with a focus on eucalyptus gall wasp and teak heartwood borer. 		
 Comments of Referee Referee 1: Project has been rated as "very good" Only best wishes for this excellent project. This project is a good example of taking research out of administrative and bureaucratic straight jacketed definition of research – leading to innovative approaches in biological research Referee 2: Project has been rated as "turne good" 		
 Project has been rated as very good One of the most important outcome of the study will be to guide the forest managers to circumscribe the areas of aggregation of pests so that they can be effectively managed in a smaller area with lesser cost and with least effect on the ecosystem Comments of RAG: Project approved 		

Project No. 8.		
Project title: Evaluation of the performance of Steam Volatile Creosot	e (SVC) as a Wood preservative	
Average Index Score : 657.58		
Name of the P.I.: Dr. S. Mohan, Scientist C	Budget : Rs.7.905 lakhs	
Name of Division: Chemistry of Forest Products	Duration : 5 years (2010-2015)	
Long term objectives of the project		
•To establish the utility of SVC as a better wood preservative compared to	creosote.	
Short term objectives of the project		
•To find out the performance of the SVC in terrestrial and marine condition	ns as a preservative for selected tree species.	
•To find out the compatibility of SVC with synthetic and natural dyes as co	blouring / coating agents	
•To work out the economics of SVC as a preservative.		
Comments of Referee		
Referee 1:		
•Methodology: The evaluation of SVC as wood surface coating and wood preservative may give good result as they (SVCs) possess desirable properties.		
PI has suggested established methods both in lab and fields		
•Project has been rated as "Very good".		
•Project well conceived and has taken into consideration all aspects of SVC application as surface coating in addition to the study on its fixing property		
with natural and synthetic colouring substances. Other than the selected species, similar study may be taken on related species for higher benefits in		
terms of academic and economic considerations.		
Referee 2.		
Methodology: Rated High Because the proposed methods are scientifically proven in various laboratories for their efficacy		
Project has been rated as "very good"		
Project is highly industry oriented and the findings of the project will have very good industrial application and will be sought after by wood industries		
and manufacturers of doors and windows.		
Comments of RAG: Project approved		

Project No. 9		
Project title: Comparative study of clones of Eucalypts and Acacia hy	brids for handicraft sector.	
Average Index Score · 657 00		
Nome of the PI Dr. S.K. Sharma Scientist E	Rudget · Ps 0.83 lakhs	
Name of the 1 .1. D1. S.K. Sharma, Scientist –	Duget . Rs. 9.05 lakits	
Name of Division: Wood Properties and Uses	Duration: 3 years (2010-2013)	
Long term objectives of the project:		
•Encourage clonal wood material for various end uses.		
Short term objectives of the project:		
• To assess the working qualities (like turning, boring, carving etc.) of	t clones of Eucalyptus tereticornis Sm., Eucalyptus eurograndis and Acacia	
<i>nybrias</i> (Acacia auriculiformis A.Cunn. ex Bentn. x Acacia mangium v	VIIIC.).	
• To compare the properties (including drying behavior) of clones with reg	uiai population.	
•Popularization of the use of clones of <i>Eucalyntus taraticornis</i> Sm Eucaly	ing quanties for nanorerant.	
•Popularization of the use of clones of <i>Eucalyptus tereficornis</i> Sm., <i>Eucalyptus eurogranais</i> and <i>Acacia hybrias</i> through demonstrations and workshops.		
Comments of Referee:		
Referee 1:		
Project has been rated as "very good"		
Referee 2:		
Project has been rated as "very good"		
Comments of RAG Project approved		

Project title: Screening and evaluation of selected members of Rutaceae from Southern India for anti-malarial activity.

Average Index Score : 649.76

0	
Name of the P.I. B.S. Chandrashekar, Scientist B	Budget : Rs. 12.75 lakhs
Name of Division: Chemistry of Forest Products	Duration: 3 years (2010-2013)
Long term objectives of the project	

Long term objectives of the project

•Clinical trials for the efficacy of the new drug. •Formulation of drug for commercial use.

Short term objectives of the project

Collection of plant materials from subfamilies *Rutoideae* (*Ruta spp* L., *Zanthoxylum spp* L., *Melicope spp.*, J.R. Forst., *Choisya spp.* H.B. & K., and *Evodia spp.* L.) Toddalioideae (*Toddalia spp.*(L.) Lam., *Acronychia spp.* J.R.Forst) and extract the phytochemicals.
Screening of extractives of bioefficacy on vector (mosquito larvae), Liver Cell lines and Red Blood Cell lines.

Comments of Referee

Referee 1:

Methodology: Approach towards stated project in achieving the objectives is clear and with suggested methods/procedure objectives will be achieved. Project has been rated as "good". The project implementation helps in investigation of plant extract for screening and treatment of malaria.

Referee 2:

Methodology: The objectives are precise and result oriented. The research work plan and approach are well planned and can be positively met within time frame.

Project has been rated as "very good"

The present scenario in the field of antimalarial research is vague and not much authenticable research out puts for treating malaria effectively have come out. In this view the project has good scope for targeting newer botanicals in combating the most prevalent disease malaria.

Comments of RAG: Project approved

Project No. 11.

Project title: Population genetics and phylogeographic studies in *Pterocarpus santalinus* L., and its *ex situ* conservation through biotechnological interventions.

Average Index Score : 626.29

Name of Division: Biotechnology (FRC Hyderabad)	

Long term objectives of the project :

Name of the P.I. Dr. S. Pattanaik, Scientist D

• To assess genetic diversity and differentiation in *Pterocarpus santalinus* L., and develop strategies for its conservation and management.

Budget: Rs. 27.36 lakhs

Duration: 3 years (2010-2013)

Short term objectives of the project:

- To study genetic diversity and differentiation in the natural, endemic populations of *Pterocarpus santalinus* L.
- To study genetic relationships (phylogeography) among the natural populations of *Pterocarpus santalinus* L.
- To conserve (*ex situ*) germplasm of *Pterocarpus santalinus* L., including genotypes having wavy grained heart wood, by way of establishing germplasm bank.

Comments of Referee

Referee 1:

•Methodology: The *in vitro* culture technique generally require concerted effort and hence may be difficult. It is always better to collaborate with the team having experience in tree tissue culture.

•It is better to concentrate only one aspect i.e., assessment of genetic diversity in the first phase.

•Project has been rated as 'Good'

Referee 2:

•Methodology: Procedures and methodologies to be adopted do not provide or reveal data necessary for population genetics on one hand and phylogeographic studies on the other. For the former, we need genetic studies and expertise. For the latter, we need to study mt DNA Besides, we need to study the species in total geographic region (AP and TN in India, though alleged to be distributed elsewhere)

•There is need to be more clear about the ex-situ conservation through biotechnological interventions. Why not in situ conservation through native germplasm introduction.

•Project has been rated as 'Good'

Comments of RAG:

The 3rd Objective "To conserve (*ex situ*) germplasm of *Pterocarpus santalinus* L.f., including genotypes having wavy grained heart wood, by way of establishing germplasm bank and through in vitro culture techniques' proposed in the RAG to be dropped. Project cost to be revised. Amount required for setting up molecular laboratory to be included in the project cost.(PI has partially dropped the third objective i.e, *in vitro* studies has been dropped. The PI has been permitted to retain the germplasm bank component)

Project No. 12.		
Project title: Identification System of Trees and Shrubs (Endemic, Ra	re and Endangered) of Andhra Pradesh	
Average Index Score 625.16		
Name of the P.I. Sh. Sudhir Kumar	Budget : Rs. 9.77 lakhs	
Name of Division: IT (FRC Hyderabad)	Duration: 4 years (2010-2014)	
 Objectives of the project Collection of morphological characteristics data of the important trees and shrubs available in Andhra Pradesh. Development of software for the identification of important trees and shrubs available in Andhra Pradesh on the bases of morphological characteristics. 		
Comments of Referee		
 Referee 1: •Methodology: The proponents of the project, nor have experience in the identification of tree species in the field. The internal resources are not adequate. There is need for training. •There are working softwares for tree/ plant identification for Indian States such as Kerala, TN etc. •So, 50% of the job or more than that is already done for the tree species occurring in AP as they are found common elsewhere. •Project has been rated as "Poor" 		
Referee 2: •Methodology: Not elaborately and clearly mentioned. Project not conceptualized and prepared in an effective manner		
Comments of RAG: Suitable platform selected for the database should also be indicated in the project proposal. Visual and descriptive data also need to be included. (PI has incorporated the RAG suggestions)		

Project No. 13.

Project title: Quantitative estimation of sandal oil from different locations by colour reaction.

Average Index Score : 623.48

Name of the P.I. S.H. Jain, Scientist B	Budget : Rs. 16.00 lakhs
Name of Division: Chemistry of Forest Products	Duration: 3 years (2010-2013)

Long term objectives of the project

•Onsite evaluation of sandal tree for its assessment of heartwood and oil content.

Short term objectives of the project

•To assess the quality and quantity of sandal wood oil in standing trees of different girth/age at different locations.

•To study the correlation of oil bearing capacity by colour reaction with standard analytical methods for field identification of high yielders.

Comments of Referee:

Referee 1:

•Methodology: Proposed biochemical methods opted to develop field method by colour reaction of living bark tissue with two reagents and establish the correlation of oil bearing capacity with laboratory method is found to be most sustainable method.

•The project proposal has been rated as "Excellent"

Referee 2:

•The objectives can be achieved with colour reaction of living bark tissue with two reagents and test its compatibility with laboratory method. •Project has been rated as "Very good"

Comments of RAG Project approved

Project No. 14	
Project title: Optimization of seed germination, vegetative propagation and nursery methods for <i>Pterocarpus marsupium</i> Roxb., and <i>Ailanthus excelsa</i> Roxb.	
Average Index Score : 535.86	
Name of the P.I. E. Venkat Reddy DCF	Budget : Rs. 12.00 lakhs
Name of Division: Silviculture (FRC Hyderabad)	Duration: 3 years (2010-2013)

Long term objectives of the project Nil

Short term objectives of the project

•To study seed germination and nursery techniques of Ailanthus excels.

•To optimize vegetative propagation methods of *Ailanthus excels*.

Comments of Referee:

Referee 1: The seed germination studies, there is ample number of information available and hence more emphasis may be given to nursery techniques including issues like season and disease control and standard techniques. Project has been rated as 'Adequate'

Referee 2:

Methodology: There is need to justify the treatment involving growth hormones, micro-nutrients and fungi.

Technical programme: Should be based on set objectives. It is always better to fix the combination of treatments on the basis of existing information. The species proposed in the proposal are very important and hence there is a need to develop reproducible propogation protocols. The investigators can produce fruitful results, if they identify the real problems and address the same in an organized way. Project has been rated as 'Good'

Comments of RAG:

Clonal propagation studies for *Ailanthus excelsa* and seed studies for *Melia dubia* to be carried out. (PI has informed that IFGTB, Coimbatore has proposed a project on micro and macroprogation studies of *Melia dubia* in their RAG 2009. Hence he requested RAG Chairman to permit him to take only *Ailanthus excelsa*. The PI has now included CMA studies on *A. excelsa*, which was not previously included in the original project)

Rain Forest Research Institute Jorhat

Project No.1

Project title: Productivity Enhancement in abandoned Jhum land through Agroforestry Management and Value Addition		
	Average Index Score : 706.1	
Name of the P.I.: Shri P.K. Kaushik, Scientist –C	Budget : Rs. 18.98 Lakhs	
Name of Division: Shifting Cultivation Division	Duration : 3 years	
Long term objectives of the project		
 Socio economic upliftment of farmers through optimization of productivity in jhum fallows and value addition. Short term objectives of the project To evolve appropriate plantation geometry and suitable tree-crop associations for productivity enhancement in jhum fallows through peoples participation To study impact of increased crop yield and value addition on socio-economic status of participating farmers Transfer of technology to farmers and entrepreneurs. 		
Comments of Referees		
Ref. I: Dr. R.K. Talukdar, Prof. & Head, Dept. of Agricultural Extension, Assam Agricultural University, Jorhat-785013		
Project is very good. It has great practical utility to farmers and planners. Good attempt.		
Ref. II: Dr. Bipin Khangia, Professor, Department of Horticulture, Assam Agricultural University, Jorhat-785013		
Very good proposal and objectives. Well estimate-budget.		
Comments of RAG		
Suggested to modify the title. Approved		

Project No.2		
Desired titles (Constitution of A million of A million of A	is in Narth Fratann India and a tablishmant of Care Daub	
Project title: Genetic evaluation of Aquilaria malaccensi	is in North Eastern India and establishment of Gene Bank	
	Average Index Score :697.9	
Name of the P.I. Dr. N. Ravi, Scientist –B	Budget : Rs. 21.704 Lakhs	
Name of Division: Biotechnology & Genetics	Duration : 3 years	
Long term objectives of the project		
Short term objectives of the project		
• To select the candidate plus trees of <i>Aquilaria malaccensis</i> from different plantations/natural range of NE		
• To collect the seeds of plus trees to establish ger	mplasm bank and progeny trial	
• To estimate genetic diversity using RAPD markers		
Comments of Referees		
Ref. I: Dr. P. Talukdar, Professor, Department of Plant Breeding & Genetics, AAU Jorhat-785 013		
Very good & well estimate proposal. Scientific merit is very good.		
Ref. II: Dr. M.K. Modi, Prof. & Head, Department of Agricultural Biotechnology, AAU Jorhat		
Very good proposal and very important objectives. Attempt is very timely		
Comments of RAG		
Suggested to relook in the budget part. Approved	Page 96	

Project title: Development of viable technique for efficient charcoal production from different bamboo species of Northeastern India

Average Index Score :697.4

Name of the P.I. Shri D. Gurung, RO	Budget : Rs. 16.68 Lakhs	
Name of Division:	Duration : 3 years	
Long term objectives of the project		
• Utilization of bamboo for charcoal production. Short term objectives of the project		
• To study the existing methods of charcoal production techniques – both traditional and contemporary.		
• Collection of bamboo samples from suitable sites for their calorific value estimation.		
Development / improvement of technology for charcoal preparation		
Comments of Referees		
Ref.I:Dr. S. Baishya, Associate Professor, Department of Biochemistry, AAU Jorhat		
Very good and well estimate proposal. Control to be included in the study. Modify AAP.		
Ref. II: Dr. Ananta Madhab Baruah, Associate Professor, Department of Agricultural Biochemistry, AAU Jorhat		
Very good and well estimate proposal.		
Comments of RAG		
Suggested to consult in 1 Multipal on Damboo charcoal. Approved		

Project title: Studies on increasing the seed viability in two recalcitrant species- *Dipterocarpus retusus* (Hollong), *Shoria assamica* (Mekai) and *Aquilaria malaccensis* (Agar)

Average Index Score :696.0

Name of the P.I. Shri N.P. Mahadevan, Scientist –B	Budget : Rs. 10.51 lakhs	
Name of Division: Biotechnology and Genetics	Duration : 3 years	
Long term objectives of the project - Nil		
 Short term objectives of the project To estimate the effect of seed collection period on germination To estimate the effect of moisture content on seeds longevity To assess the effect of storage condition on seed longevity 		
Comments of Referees		
Ref. I: Dr. (Smt.) Akashi Sarma, Principal Scientist, Department	of Plant Breeding & Genetics Station, AAU Jorhat	
Suggested to modify the proposal.		
Ref.II: Dr. Prakash Borah, Principal Scientist, Department of Plant Breeding & Genetics, AAU Jorhat		
A very good and well estimate proposal. Seed treatment with suitable fungicide may be included.		
Comments of RAG: Suggested to include Shorea assamica in the	project. Approved	

Project title: Ethno-medico-botanical Studies of Khasi , Garo and Karbi Tribes Average Index Sco	
Name of the P.I. Shri H.N. Dhungana, Research Officer	Budget : Rs. 5.22 lakhs
Name of Division: Ecology & Biodiversity Division	Duration : 3 years
Long term objectives of the project	
• To collect and document the indigenous knowledge of medicinal plants resources used by Khasi, Garo tribes of Ribhoi district of Meghalaya and Karbi tribe of Assam bordering Ribhoi district.	

Short term objectives of the project

- Survey and documentation of indigenous knowledge of medicinal plants.
- To study cross cultural uses of medicinal plants by different tribes.
- To assess the attitudinal change among the target tribal groups towards traditional medical practices in the changing socio- economic situation.

Comments of Referees

Ref.I: Dr. I.C. Barua, Principal Scientist, Department of Agronomy, AAU Jorhat

Good and well estimate proposal. Objectives are important. Collect correct information of plants and pay serious attention.

Ref.II: Dr. S.C. Nath, Deputy Director, Medicinal and Aromatic Plant Division, NIEST, Jorhat

Good and well estimate proposal. Add more reference

Comments of RAG

Approved.

Project title: Exploration of diversity and utilization potential of Sphagnum species of forestry importance in North –east India		
	Average Index Score :671.1	
Name of the P.I.: Dr. Praveen Kumar Verma, Research officer	Budget : Rs. 11.50	
Name of Division: Shifting Cultivation Division	Duration : 3 years	
Long term objectives of the project		
• Exploration of diversity and utility potential of <i>Sphagnum</i> and some moss species. Short term objectives of the project		
 Survey, collection and conservation of the <i>sphagnum</i> species. Taxonomical characterization of selected species. Exploration for utilization potential as substrate media. Technology development for mass multiplication of selected species. Development of mass multiplication techniques of selected species. 		
Comments of Referees		
Ref.I: Dr. P.B. Kanjilal, Deputy Director, Medicinal and Aromatic Plant Division, NIEST, Jorhat		
Excellent and well estimate proposal. Collected germplasm should be maintained for future R & D works.		
Ref.II: Dr. I.C. Barua, Principal Scientist, Department of Agronomy, AAU Jorhat		
Very good and well estimate proposal. Add more reference. Activities will give a very useful outcome.		
Comments of RAG		
Appreciate the project concept. Suggested to concentrate one or two	o states. Approved.	

Project title: Development of vegetative propagation protocol of selected bamboo species.

Average Index Score :668.1

Name of the P.I.: Dr. K. C. Pathak . Scientist –C	Budget : Rs. 16.27 Lakhs	
Name of Distance Oiling to the Dance Management	Denne there are 2 Marcan	
Name of Division: Sinviculture Forest Management	Duration: 3 Years	
Long term objectives of the project		
• To develop planting materials for propagation in commerc	ial scale.	
Short term objectives of the project		
• Development of an efficient method of propagation.		
Comments of Referees		
Ref. I: Dr. Romen Sarma, Professor, Department of Plant Breeding & Genetics, AAU Jorhat		
Adequate and well estimate proposal. Long term objective needs a revision.		
Ref.II: Dr. S.C. Das, Retd. Scientist, Plant Improvement Division, Toklai Experimental Station, Tea Research Association, Jorhat		
Vary good and well estimate managed. Aim should be featured clearly Experiment on fartilizer application is not presented.		
very good and wen estimate proposal. Ann should be focused clearly. Experiment on fertilizer application is not proposed.		
Comments of RAG		
Approved.		

Project title: Assessment of insect pest problems of selected bamboo species in Assam and their eco-friendly management

Average Index Score : 625.3

Name of P.I.: Shri R. Raja Rishi, , Scientist –B	Budget : Rs. 7.472 Lakhs	
Name of Division:	Duration: 3 years	
Long term objectives of the project		
Nil		
Short term objectives of the project		
• To assess the insect pest spectrum of Bambusa tulda, B.balcooa, B.pallida and B.nutans.		
 To assess the incidence and intensity of insect pest attack and categorize the major and minor pest problems. To assess the biotic and abiotic factors pre-disposing the plants to insect pest attack To evolve suitable ecofriendly management strategies. 		
Comments of Referees		
Ref.I: Dr. Bijan Characteristics.Dutta, Principal Scientist, All	India Network project on Rodent Control, Department of Entomology, AAG	
Jorhat.		
Very good and well estimate proposal. Title may be changed. Methodologies not sufficient / clear.		
Ref.II: Dr. S.K. Dutta, Associate Director, Extension Education, AAU Jorhat 785013		
Proposal may be accepted in the RAG To evolve suitable eco-friendly management		
Comments of RAG		
Suggested to include the scope of rats and rodents in the study. App	proved	

Project title: Studies on species diversity of Ganoderma in Assam with reference to utilization and cultivation of its selected species

Average Index Score : 620.9

Name of P.I.: Shri R. K. Kalita, Scientist -C	Budget : Rs. 6.87 Lakhs	
Name of Division:	Duration: 2 years	
Long term objectives of the project		
• To study the species diversity of <i>Ganoderma</i> in Assam and to utilize and develop cultivation protocol of its selected species. Short term objectives of the project		
 To study the species diversity of <i>Ganoderma</i> occurring in major agro-ecological zones of Assam. To study on utilization of <i>Ganoderma</i> by different tribal population of Assam. To explore the market potential of <i>Ganoderma</i> in Assam. To develop cultivation protocol of selected <i>Ganoderma</i> species suitable for Assam condition. 		
Comments of Referees		
Ref. I: Dr. Mitul Saikia, Associate Professor, Department of Plant Pathology, AAU Jorhat		
Excellent and well estimate proposal.		
Ref.II: Dr. Ashok Bhattacharya, Professor, Department of Horticulture, AAU Jorhat		
Short term objectives may be clubbed into two or three. Emphasis on cultivation and conservation. Diversity may be studied at Molecular level.		
Comments of RAG: Reduced duration to 2 years with modification in objectives. Market survey in Assam. Suggested. Approved.		

Project title: Exploration and conservation of genetic resources of selected rare and endemic plants of Northeast India

Average Index Score : 584.9

Name of P.I.: Shri H.R. Bora, RO	Budget : Rs. 13.75 Lakhs	
Name of Division:	Duration: 3 years	
Long term objectives of the project		
• Conservation of genetic resources of selected plant species.		
Short term objectives of the project		
• Exploration of the species		
• Documentation of traditional knowledge		
• Raising of planting materials through different trials		
• Awareness generation for plantation and conservation		
Comments of Referees		
Ref.I:		
Project title is not properly and fully reflected in the objectives/ text.		
Ref.II:		
Very good and well estimate proposal. Need for ex-situ conservation efforts for rare and endemic plants		
Comments of RAG		
Suggested to review literature thoroughly. Modify project title and one short term objectives. Approved.		

Project No.1		
Project title: Assessment of variability and genetic fingerprinting in <i>Pongamia pinnata</i> (L.) Pierre using inter simple sequence repeat (ISSR) markers		
	Average Index Score :740	
Name of the P.I.: Dr. Sanjay Singh, SC – D	Budget: Rs. 26.09 Lakhs	
Name of Division:Botany Silviculture& NWFP	Duration : 4years	
Long term objective of the project - Nil		
Short term objective of the project		
 Selection and screening of superior genotypes of <i>Pongamiapinnata</i> on morphometric and biochemical parameters. Assessment of genetic variability at the molecular level in accessions of <i>Pongamiapinnata</i> through ISSR markers. Identification of ISSR markers for morphological and oil-yield and quality traits among selected genotypes. Comments of Referees 1 Dr. RajibBandopadhyay, Senior Lecturer, Department of Biotechnology, BIT, Mesra, Ranchi Title : Title looks okay except "loci mapping" PL may think regarding "loci mapping" because they are not using any mapping population. 		
 for the proposed work then how PL will map? Objectives: For the first objective it is not clear how they will develop ISSR from <i>P. pinnata</i> and <i>M. latifolia</i>. I think PL will only screen ISSR.Objective 2 is clear,Objective 3 may be slightly modified. PL may identify some ISSR marker related to some morphological character/oil yielding trait etc. Methodology: Overall methodology is oaky. i) PL should be cautious regarding plant materials selection. I think PL may start with one plant say <i>Pongamiapinnata</i>.ii) Will PL develop new ISSR for the proposed materials? Or PL wants to screen with the available ISSR for forest plant? Then they have to fix the number how many primers PL will take for the proposed study. 		
Work Plan : Looks good		
	Page 105	
Relevance to scientific excellence: As both the plants are important as a forest plant and may be also used as Biofuel source so genetic diversity, phylogenetic relation study and ISSR marker tagging related to some important character may be studied

Product / Process development: No product or process will be developed but some ISSR marker may be tagged for particular character and molecular documentation will be developed for further study

Socio-Economic importance/ Application oriented: In future these markers may help to screening in early stage for a particular character and finally good clone may help socio-economically

Expertise of PL/ CO-PL & implementing Institute: I am sorry. I cannot comment on PL's expertise as there is no CV or publication list of PL with the project proposal.

The infrastructure facilities are available there and required instrument list the project may be possible. **Budgetary details:** For manpower, JRF may be promoted to SRF after two years so budget should be checked, otherwise it is okay. **Other Information, If:**The project may be funded after minor correction of title and objective.

2. Dr. Binay Kumar Singh, Scientist, Directorate of Rapeseed Mustard Research Sewar, Bharatpur, Rajasthan

Title :Title of the proposed project may be modified as "Assessment of genetic variability in *Pongamiapinnata* (L.) Pierre and *Madhucalatifolia* (L.) J. F. Macbr. using ISSR markers" to illustrate the objectives more clearly.

Objectives: In view of the volume of work and set up of the laboratory, it would be better to start the study with only one species. In this connection Pongamiapinnata should get priority due to its well-recognized potential and wide-scale applicability in the arena of biofuel production. Besides, it is also suggested that apart from using ISSR markers, some STMS markers from well characterized pulse crops may also be included in the study.

Objectives 1 and 3 should be modified to make them clearer.

Methodology: Overall technical programme is as per standard procedure. However, it is desirable to include more number of diverse lines from the natural populations or germplasms collections to make the study more meaningful. A well-defined panel of diverse lines for oil content or individual fatty acid may be developed for linkage disequilibrium (LD) or association mapping of oil related traits in future.

Work Plan :Survey and collection of germplasms should be given more time, may be extended till the second quarter of the 2nd year and if possible one full year should be devoted to the studies on variability in oil content/fatty acid profiles of the germplasms to make the research work more meaningful. Necessary help may be taken from organizations like Directorate of Oilseeds Research, Hyderabad involved in similar type of work on *Pongamiapinnata*. Molecular variability studies using ISSR markers may be completed in the remaining one and half

year.

Relevance to scientific excellence: Successful completion of the proposed project will reveal the variability in different populations of *Pongamiapinnata* prerequisite for hybrid breeding programmes as well as LD mapping of important traits. Variability within the population is expected to be very limited as *Pongamiapinnata* is an outbreeding species. Superior genotypes identified through biochemical studies will be marked through molecular means which would be helpful in MAS of similar genotypes. Besides, superior genotypes may be multiplied clonally to meet regional as well as national demands.

Product / Process development: Successful completion of the proposed project will lead to the development of simple molecular tool for the identification of superior genotypes of *Pongamiapinnata*. Besides, it will also generate base material prerequisite for advanced research programmes on *Pongamiapinnata*.

Socio-Economic importance/ Application oriented: As mentioned in previous columns, superior genotypes identified through biochemical studies and tagged through molecular markers may be multiplied through clonal means and supplied to SFDs as well as local farmers.

Expertise of PL/ CO-PL & implementing Institute: As I am personally well acquainted with the PL, I feel he possess all the necessary expertise required for the successful completion of the proposed project. Implementing institution, IFP, Ranchi has all the basic facilities required for the molecular work. However, for biochemical studies, other institutions mentioned in previous column may be collaborated. Suitable persons for this work may be contacted well in advance and institution be mentioned in the research proposal form.

Budgetary details: Optimum budget has been allocated on each head. **Other Information, If:**All the best.

Comments of RAG

- Title should be modified as 'Assessment of genetic variability in Pongamiapinnata (L.) Pierre using inter simple sequence repeat (ISSR) markers'.
- 4-5 random accession varying in oil traits should be analysed.
- PI was asked to take reasonable nos. of accession (not too many) so that work may be completed smoothly within the proposed budget.

Project No.2	
Project title: Protocol optimization for in vitro Propagation and	Conservation of Rauwolfiaserpentina and Asparagusracemosus –
important medicinal plants	
	Average Index Score :730
Name of the P.I.: Dr. A. Sinha, SC – C	Budget: Rs. 10.70 Lakhs
Name of Division: Genetics & Tree Propagation	Duration : 3years
Objectives of the Project	
 To develop a reliable protocol for the rapid and mass scalep To standardized the <i>in vitro</i> method for short and medium to 	ropagation of plants in short duration of time and space erm conservation of medicinal plant cultures
Comments of Referees	
1. Dr. (Mrs.).Kamini Kumar,Reader, University Dept. of Bota	ny, Ranchi University, Ranchi
Title : Correct	
Ubjectives: Correct Methodology: Up to the mark	
Work Dian : Correct	
WORK Flait : Coffect	
Relevance to scientific excellence: Satisfactory	
Product / Process development: The results may enhance the process development: The results may enhance the product of the p	propagation
Expertise of PL / CO-PL & implementing Institute: They are	expert in their field
Budgetary details: Within limit	expert in them field.
Other Information. If:-	
2. Dr. Ambarish S. Vidvarthi Professor & Head, Dept. of Bioto	echnology BIT. Mesra Ranchi
Title : Correct	
Objectives: General objectives should be specific.	
Methodology: Need more elaboration.	
Work Plan : Need more specific mile stones.	
Relevance to scientific excellence: Relevant. However, objecti	ves proposed are very preliminary.

Product / Process development: Partially yes.

Socio-Economic importance/ Application oriented: Yes

Expertise of PL/ CO-PL & implementing Institute: Could not be determined due to lack of information provided.

Budgetary details: Good

Other Information, If: Suggestion: It would be better if synthesis of a particular alkaloid is targeted.

3. Dr. K. K. Nag (Retd. Prof. & Ex-Head, University Dept. of Botany, Ranchi University, Ranchi and Ex-V.C., BinobaBhave, University, Hazaribagh) Rameshwaram, Bariatu Road, Ranchi

Title : Correct

Objectives: clear

Methodology: The methodology adopted by previous workers on these plants should be followed and various permutation combinations may be attempted for better result.

Work Plan :Suitable but needs to be amended as per progress of the work.

Relevance to scientific excellence: Totally relevant

Product / Process development: Progress may be refined further for higher percentage of success in propagation/ conservation.

Socio-Economic importance/ Application oriented: It is fully application oriented for socio-economic and medicinal importance.

Expertise of PL/ CO-PL & implementing Institute: PL is fully capable; however, for future the Institute may consider to obtain the instruments for liquid N2 preservation which would be the best technique for gene-conservation.

Budgetary details: Sufficient for the present objectives.

Other Information, If: The Project is recommended for implementation.

Comments of RAG

- These being academic projects, may be taken up. However due care should be taken to avoid any repetition of work.
- Explants may also be collected from in vitro raised plants. Studies on variant of callus/ suspension may also be included.
- Liquid suspension culture may be used. For that reason shaker with controlled temperature may be purchased and budget may be revised.
- Mutagens may be applied for reducing growth.
- Synthesis of particular alkaloids is to be targeted. For this purpose the lab facility of BIT, Mesra may be explored with consultancy charges/ collaboration.
- Field demonstration of tissue culture raised medicinal plants under study should be done in small scale on farmer's field. Budget provisions proposed for the third year may be revised to meet the requirement for extension works.

Project No.3		
Project title:1. Studies on edible shoot production potential of	indigenous and introduced bamboos in Jharkhand and enhancement of	
production period through cultural practices		
	Average Index Score :720	
Name of the P.I.: Dr. S. Nath Scientist – E	Budget: Rs. 23.00 Lakhs	
Name of Division: Forest Soil & Land Reclamation	Duration : 4years	
Long term objective of the projectNil		
Short term objective of the project		
 Assessment of shoot production potential and shooting period of indigenous and exotic bamboos Enhancement of shoot production by improving soil health Study on shoot production as influenced by various mode of planting techniques To study shoot production as influenced by clump or Grove Management. Standardization of shoot extraction method. 		
Comments of Referees		
• Project proposal was sent to the 5 referees but no comments	were received.	
Comments of RAG		
• The concept of the project was highly appreciated.		
• The study should be taken up on farmer's field in collaboration with willing farmers/villages, so that it is more utility driven, and help to		
reduce pressure of removal of bamboo shoots (Karil) from forests.		
• Mulching with grasses may be tried.		
• Some of the trials should be laid on farmers field in selected implementation by the Institute.	districts of Binar also where the "SASVPSY of Binar State" is already under	
• Scientific survey should be conducted to assess extraction of be generated.	bamboo culms from the forests and data on their basic level of extraction may	
Comparative studies on nutritive value and some components	s on quality of shoots, its importance as nutraceuticals and use as dry	

products may be considered within the project.

- The project may be modified by reducing the no. of objectives and concentrating on the key issues only with clear cut mention of design of experiment/ work plan/ methodology/ no. of treatments and replications with fixed number of species. User group should be specified. Bench level survey activities should be included on the consumption of edible shoots, tapping and exploitation of the resource by the people of Jharkhand and adjoining states.
- Studies on existing practices of harvesting present level of exploitation and preference of species on the basis of edibility may also be included. Data on the percentage and type of populace who consume bamboo shoots may also be generated on the basis of field study/ survey.

Project No.4		
Project title: Studies on v	ariability in rooting proficienc	cy in selected genotypes of Pongamiapinnata (L.) Pierre
Average Index Score :720		
Name of the P.I.: Dr. A. S	Sinha, SC – C	Budget: Rs. 8.40 Lakhs
Name of Division:Genetic	s & Tree Propagation	Duration : 2years
Long term objectives of the	he project	
 Standardization of clonal propagation through stem cuttings for establishment of plantations of promising genotypes for increased productivity 		
Short term objectives of t	he project	
• To study the effect of	plant growth regulators in root i	nduction and differentiation
• To study the effect of	other cutting characteristics such	h as juvenility and cutting position on rooting
• To study the variation	among selected genotypes on ro	ooting
 To disseminate the developed clonal procedure among end users 		
Comments of Referees: Dr. A. K. Handa, Senior Scientist, National Research Centre for Agroforestry, Gwalior Road, Jhansi		
Title :	The Title of the Project "Studie self-explanatory and corre	es on variability in rooting proficiency in selected genotypes of <i>Pongamiapinnata</i> " is ect.

Objectives:	The objectives mentioned in the project proposal are as per the Title of the Project.	
Methodology:	The title and one of the objectives mentioned to study the variation among different genotypes for rooting but in	
	detailed work plan there is no mention of how many germplasm are available in the institute from where cuttings will	
	be taken, what is the age of the mother trees of different germplasms.	
	Very little detail has been given about the work plan, it is better to clearly mention the time frame when, the stem	
	cuttings will be collected, what growth regulators will be used and there concentrations (Like IBA, NAA, 2-4 D,	
	combinations of these, whether these will be used in paste / powder form or as liquid form. How many cuttings per	
	treatment and how many replications will be there, cuttings will be raised in mist chamber or open conditions.	
	There is need to clearly mention all these points in the final Project Proposal	
Work Plan	- do -	
Relevance to scientific	The study will provide a good information on the rooting ability of different genotypes of <i>Pongamiapinnata</i> and will	
excellence	help in selection of good genotypes for large scale multiplication through stem cuttings.	
Product / Process	The technique for vegetative propagation of <i>Pongamiapinnata</i> through stem cuttings developed at some places will be	
development	further refined and standardized.	
Socio-Economic	The study has socio – economic importance as it will provide a technique for large scale multiplication of the selected	
importance/ Application	genotypes of <i>Pongamia</i> through vegetative means.	
oriented:		
Expertise of PL/ CO-PL & implementing	The Institute has required infra structure to undertake the said project proposal and PL is capable of handing this	
& implementing Institute	project proposal.	
Other Information, If	The proposed budgetary details are essential to undertake the proposed study.	
Rudgetary details	Recently many studies have been conducted on vegetative propagation of <i>Pongamianinnata</i> through stem cuttings in	
L'auguar y actains	India, the PL should go through all those findings for finalizing the treatment details for better results	
Comments of RAG	nora, die 12 should ge unough an those findings for findingh de douthont douther for obter fooulds.	

Stem cuttings should be collected from different age group of trees. Also different root promoting hormones should be tried.Season for cutting collection should be standardized.

• Project duration should be increased.

• One JRF &/ or one field assistance may be appointed for detailed project work.

• Project should be formulated for a period of 3 year in place 2 years and accordingly budget should be revised.

Project No.5 Projecttitle:Study of various factors effecting the quantity of active principles in some commercially important medicinal plants under cultivation **Average Index Score :700** Name of the P.I.: Dr. M. Ray, Scientist – D Budget: Rs. 14.00 Lakhs Name of Division:Biodiversity and Conservation Division **Duration :** 3years Long term objectives of the Project - nil Short term objectives of the Project To study the variation in the quantity of active principles of selected medicinal flora cultivated under different forest tree species • To undertake a time series study of the quantity of active principles in selected medicinal flora Evaluation of the quantitative difference in active principles in plants raisedfrom seeds and cuttings. Comments of Referee: 1. Dr. D. Sasmal, HOD, Department of Pharmacy, BIT, Mesra, Ranchi Title : Approved Should be mentioned : **Objectives:** 1. How to calculate total yield. 2. How to enhance the yield of constituents **Methodology:** Approved Work Plan Approved **Relevance to scientific excellence** Approved **Product / Process development** Approved Socio-Economic importance/ Application oriented: Approved

Expertise of PL/ CO-PL & implementing Institute	Approved	
Other Information, If	Consumable like chemicals glassware not mentioned. Name of HPLC column.	
Budgetary details	N/A	
Comments of Referee: 2. Dr. Subhendu A. GangulyRetd.	. Ex. Professor, Dept. of Botany, Bose Institute, Kolkata	
Title :	Good	
Objectives:	Excellent	
Methodology:	Appropriate	
Work Plan	Good	
Relevance to scientific excellence	Scientifically Sound	
Product / Process development	During the tenure of the project it is almost impossible to develop any process.	
Socio-Economic importance/ Application oriented:	The project is very much application oriented and has a great socio-economic	
	importance.	
Expertise of PL/ CO-PL & implementing Institute	Expertise of PL and infrastructural facilities available in the institute are adequate.	
Other Information, If	Budgetary details are alright but in my estimate it is little bit lower side.	
Budgetary details	The project is very important in respect of developing a lead compound of medicinal	
	importance.	
Comments of Referee: 3. Director, Central Institute of M	edicinal and Aromatic plants, P.O. CIMAP, Near Kukrail Picnic spot, Lucknow	
Title :	May be modified as : -	
	Effect of propagation method, and plant growth regulators and age of crop on yield	
	and active principles of some medicinal plants cultivated under shade of different	
Objectives:	Assessment of vield is most important. It may be included	
Methodology:	May be clarified with treatments and experimental design as suggested	
Work Plan	Recording of observations on growth yield and quality parameters may be given	
	systematically	
Relevance to scientific excellence	Good	
Activities to perturne excentioned	0000	

Product / Process development	Quality raw material for drug and pharma industry will be made available on
	affordable price.
Socio-Economic importance/ Application oriented:	Yes
Expertise of PL/ CO-PL & implementing Institute	Neither field of specialization nor bio-data of PL/ CO-PL is given. Hence no
	comment on this point.
Other Information, If	Reasonable. The requirement of JRF should be entire period of research i.e. 3 years.
Budgetary details	Data on the allelopathic effect of associated medicinal plants and with tree species
	may also be generated if possible.

Project No. 6		
Project title: In vitro Conservation of Bamboo Species for Short	and Medium Duration Storage and Their Effect on Regeneration	
	Average Index Score : 680	
Name of the P.I.: Dr. A. Sinha, SC – C	Budget: Rs. 16.60 Lakhs	
Name of Division:Biotechnology, Genetics & Tree BreedingDuration: 3years		
Objectives of the Project		
 Refinement of protocol for <i>in vitro</i> propagation of commercial important Bamboo species in eastern India. To standardized the <i>in vitro</i> method for short and medium term conservation of germplasm. 		
• To test the regeneration potential of the plant propagules after	r storage.	
Comments of Referee		
Referee -IDr. D. Saha, Scientist (SS) Lac Production Division, IINC	jR, Namkum, Ranchi	
Title :	In vitro conservation of different Bamboo spp. for short and medium	
	duration storage and their effect on regeneration.	
Objectives:	Needs revision and modification.	
	Obj1 : has already been carried out by several workers.	
Obj2 : Can be the objective 1. Second objective can be to		
detect the periodical changes in plant propagules		

morphologically, biochemically under storage.	
Obj3 : Can be to test the regeneration potential of the plant	
propagules after storage	
Needs elaboration and defined specifically step wise.	
Change accordingly if decided for the above modifications.	
Needs improvement in terms of generating useful information.	
Would be a good approach for process development.	
Application orientation	
Ok	
Ok	
1. The PI can consult with Tissue Culture Laboratory of NBPGR, New Delhi	
who are working in similar line of work in other spp.	
2. Cryopreservation of clums can also be tried.	

Comments of RAG

• Care has to be taken to avoid any repetition of work for which detailed review of literature is suggested .

- The project is purely academic in nature, it will not help in 'species improvement' as mentioned by the PI under 'Expected Outcome'.
- Liquid suspension culture may be used and budget may be revised accordingly.
- Demonstration of tissue culture raised plants of selected four bamboo species under study should be taken up in small scale.

Project No. 7	
Project title: Standardization of nursery techniques for cultivation of Celastruspaniculatus and	d Vitexpeduncularis – medicinal plants
highly exploited in Jharkhand	
	Average Index Score : 670
Name of the P.I.: Dr. M. Ray, Scientist – D	Budget: Rs. 9.99 Lakhs
Name of Division: Biodiversity and Conservation	Duration : 3years
Long term objectives of the project - nil	

Short term objectives of the project

- Collection of QPM from natural forests and other sources.
- Standardisation of nursery techniques for raising *Celastruspaniculatus* and *Vitexpeduncularis*
- Development of agro-techniques for cultivation of the selected species.

Comments of Referee

Referee -1Dr. S. Jha, ProfessorDepartment of Pharmacy, BIT, Mesra, Ranchi

Title :	Approved	
Objectives:	Short term and long term objectives of the project should be mentioned separately.	
Methodology:	Not mentioned	
Work Plan	Approved	
Relevance to scientific excellence	Approved	
Product / Process development	Approved	
Socio-Economic importance/ Application oriented:	Approved	
Expertise of PL/ CO-PL & implementing Institute	Approved	
Other Information, If	Consumable likes glassware, fertilizers, pesticides may also be included.	
	Equipments like HPTLC, GSC will help to determined pesticidal residues.	
Budgetary details		
Referee -2. Dr. Jyoti Kumar Department of Botany, Ranchi University, Ranchi		
Title :	Correct	
Objectives:	Is in right direction	
Methodology:	Details of methodology not mentioned in 2041.	
Work Plan	Clear	
Relevance to scientific excellence	The work will contribute to new agro-techniques.	
Product / Process development	-	
Socio-Economic importance/ Application oriented:	The result will benefit the village people for economic upliftment.	
Expertise of PL/ CO-PL & implementing Institute	PI is expert in her field.	
Other Information, If	The budget should be for JRF not for Field Assistant because of the scientific work	
	on this filed.	
Budgetary details	For further help course co-ordinator Post Graduate Diploma in Medicinal Plant,	

University Department of Botany, Ranchi University may be consulted.		
Referee -3 Dr. Kaushal Kumar SMS, Faculty of Forestry	Birsa Agricultural University, Kanke Ranchi	
Title :	Good	
Objectives:	Perfect	
Methodology:	Include as suggested in comment. Comments is annexed.	
Work Plan	Adequate	
Relevance to scientific excellence	Yes	
Product / Process development	No/ The proposal is meant for study of necessary techniques.	
Socio-Economic importance/ Application oriented:	Yes. Beneficial for the community.	
Expertise of PL/ CO-PL & implementing Institute	Sufficient.	
Other Information, If	May approve.	
Budgetary details	Please see the comments. Comments is annexed.	
	·	

Comments of RAG

• It is suggested to focus on nursery technique cultivation and processing of *Celastruspaniculatus* and *Vitexpendurcularis* in collaboration with villagers/ farmers/ SFD. The requirement of JRF for undertaking scientific work regarding propagation of these two endangered species in Jharkhand was justified by the PI. Some research scholar may pursue research on this topic for obtaining Ph. D. degree at IFP Centre of FRIU.

Project No.8.		
Project title: Study on documentation of existing scenario on of agro-forestry models a participatory approach in Central Plateau and Hill region in Jharkhand	and development	of suitable models through
		Average Index Score : 640
Name of the P.I.: Dr. Rajiv Rai, Scientist-D	Budget: R	s. 181.15 Lakhs
Name of Division: Extension & Publicity	Duration :	5years (2010-2015)

Long term objectives of the project

- To motivate and mobilize farmers to transfer the technological models for adoption and establishment of their demonstration .
- Dissemination of information for transfer of technology utilizing extension aids .

Short term objectives of the project

- To conduct resource survey for identification of existing suitable tree crop combination species on agricultural land and homestead plantations.
- To develop technological packages and test them on basis of growth, yield and economics of companion crop.

Comments of Referee : 1. Dr. O. P. Chaturvedi, Head Plant Science Division, Central Soil & Water Conservation Research & Training Institute,		
Dehradun		
Title :	Modify the title as - Assessment and demonstrations of agroforestry practices in	
	agro climatic conditions of Ranchi	
Objectives:	To be modified as suggested in the text as follows :	
	1. To identity existing agroforestry practices.	
	2. To establish process agroforestry practices at farmers fields.	
	3. To evaluate production and economic potentials of established agroforestry	
	system. (Will it be possible in two years?)	
	4. Dissemination of information for transfer of technology on agroforestry utilizing	
	extension aids.	
Methodology:	To be modified as suggested in the text	
Work Plan	-Do-	
Relevance to scientific excellence	-Do-	
Product / Process development	-Do-	
Socio-Economic importance/ Application oriented:	-Do-	
Expertise of PL/ CO-PL & implementing Institute	Adequate expertise and facilities are available at the implementing Institute.	
	However, some expert advice during initial phase of the project can be obtained	
	from out side as being done in agroforestry project at Coimbatore.	

Other Information, If	May be modified in the light of revised technical programme. The budget can be
	modified in the light of revised objectives and technical programme.
Budgetary details	
Comments of Referee	2. Dr. S.M.S. Quli Professor, Dept. of Extension & Social Forestry, Birsa
	Agricultural University, Kanke, Ranchi- Title : 06Title to be changed and should
	specific to agro-climatic zone in Jharkhand
	Objectives: Objectives to be revised as per topic.
	Methodology: 1) The duration of project to be recasted for five years instead of
	two years, in three splits
	a) Study existing models, 2 years
	b) study on establishments of suitable models 2 yrs
	c) Transfer of Technology. 1-2 years overlapping
	2) Three sites a)away from forest b) close to forest c) in the vicinity of forest to be
	selected in 3-4
	districts of Jharkhand to know dependence of people on agroforestry needs as
	discussed with PI in
	details with literature provided
	3) Details of Jharkhand to be incorporated and detailed
	methodology to be incorporated for justifying
	needs of such study as per literature provided to PI
	4) Design and diagnostic survey to be incorporated as suggested.
	Work Plan: Work plan shall change with models to be developed based on D & D
	Survey and work to be revised
Relevance to scientific excellence	-Do-
Product / Process development	-Do-
Socio-Economic importance/ Application oriented:	- <u>D</u> O-
Expertise of PL/CO-PL & implementing Institute	Adequate expertise are available with Institute however some expertise may be
Laperate of TL, CO TL & Implementing institute	associated with National Research Centre for Agro-forestry Jhansi

Other Information, If	Manpower to be enhanced : Team to be constituted with Senior Project Associate
	One, Two JRF'S, Two Project Assistants with suitable pay structure.
	New Equipments to be identified and listed with tentative cost and purpose for
	use as discussed .
	Travel Vehicle with driver full time is needed to be incorporated in the project
	Financial Budget to be recasted as per methodology and technical plan .
Budgetary details	
Comments of Referee : 3. Dr. Shivendra. Kumar, Princip	al Scientist & Head, Horticultural & Agro-forestry Research Programme (ICAR),
Plandu, Namkum, Ranchi	
Title :	Title to be changed and specific to agro-climatic zone in Jharkhand
Objectives:	Objectives to be revised as per topic
Methodology:	1) The duration of project to be recasted for five years instead of two years , in
	three splits
	a) Study existing models, 2 years
	b) study on establishments of suitable models 2 years
	c) Transfer of Technology . 1-2 years overlapping
	2) Physiological studies to be incorporated
Work Plan	Work plan shall change with models to be developed based on D & D Survey and
	mobilizing work to be revised
Relevance to scientific excellence	-Do-
Product / Process development	-Do-
Socio-Economic importance/ Application oriented:	-Do-
Expertise of PL/ CO-PL & implementing Institute	Adequate expertise are available with Institute ,however some expertise may be
	associated with National Research Centre for Agro-forestry Jhansi
Other Information, If	
Budgetary details	Manpower to be enhanced; New Equipments to be identified and listed with
	tentative cost and purpose for use as discussed.; Financial Budget to be recasted as
	per methodology and technical plan.

Project title: Creation of database on cultivation, production and marketing of commercially important medicinal and aromatic plants and their pharmaceutical applications for development of decision support system in Jharkhand

Average Index Score : 580

Name of the P.I.: Dr. Rajiv Rai, SC-D	Budget: Rs. 10.69 Lakhs
Name of Division: Extension	Duration : 3years(2010-2013)

Long term objectives of the project:

• Dissemination of information to end – users & stake holders – utilising extension aids.

Short term objectives of the project:

- To study extent of utilization of commercially important medicinal and aromatic plants and their cultivation and production in prominent pockets.
- To record information on available formulations used in pharmaceutical application in local market.
- Identification of plants under over-exploited and under threat a per IUCN guidelines and develop models and strategies for their conservation.
- Preparation of computer based data base and development of decision supporting system

Comments of Referee: 1. Dr. S. G. Abhas University Professor cum Chief Scientist, H.O.D. Forest Product & Utilization, Faculty of Forestry, Birsa Agricultural University, Kanke, Ranchi – 384 006

Title	Not perfect according to proposal
Objectives	Needs revision
Methodology	Needs revision
Work Plan	Not adequate
Relevance to scientific excellence	Not justified
Product / Process	Less chance
development	
Socio-Economic importance/ Application oriented	Satisfactory
Expertise of PL/ CO-PL & implementing Institute	• Pertains to survey works and documentation only. The bio-data of

investigators are not enclosed for evaluation of expertise.
•
 Review report on Proposed Research Project entitled "Creation of database on cultivation, production and marketing of commercially important medicinal and aromatic plants and their pharmaceutical applications for development of decision support system in Jharkhand". The Proposal of the project may be accepted with the following modification/ revision noted below. The title of the project reflects many objectives, which are not justified with practical utility as dealt in point 213 (pl. see proposal) like the output of the proposed project will certainly lead to the development of new herbal drugs in marked based on seasonal variation in chemical content of medicinal and aromatic plants. Owing the above views, the proposal should be rewritten and a series of experiment related to quality evaluation of herbal drugs are required for fulfillment of the above aims. Certainly, there are not any standard methodology, work plan etc. have been mentioned in the proposal. As a result, the present proposal of project could simply provide documentation of cultivated medicinal plants of Jharkhand based on the records of surveys in the field. Although, there are a large number of data available or published earlier pertains to medicinal plants of Jharkhand which are not properly reviewed and mentioned in the proposal. To avoid duplication of survey works, PI should have ensure to review the earlier works. The quality of herbal drugs always depends on the phytogeography, agro technology, duration or period of collection, stages of plants parts maturity before collection, harvesting and storage condition etc. Therefore emphasis should also be given on above amplitude as objectives for better understanding of potency of medicinal plants. There is no methodology, state of art and strategies in the proposal towards conservation of our archide plants as desired in objectives.

is no laboratory works have been described in the proposal, while
point 2137 of the proposal states that some of the new records can be
patented. It is also not clear and justified. The project title,
objectives, methodology etc. should modify according to desired
practical utility of the proposal in scientific parameter and standard.

Comments of Referee: 2.Dr. S.P. Singh, Head TOT wing, Central Institute of Medicinal and Aromatic plants P.O. CIMAP, Picnic shot Kurail, Lucknow-15

Title	Appropriate
Objectives	Well defined
Methodology	Proper
Work Plan	Clear
Relevance to scientific excellence	Yes
Product / Process	Possible
development	
Socio-Economic importance/ Application oriented	Very much important
Expertise of PL/ CO-PL & implementing Institute	Infrastructural facilities available at IFP PL/ CO-PL are capable to do this
	project
Budgetary details	This much budget is required for this project
Other Information, If	

Project No.10		
Project title: E	nhancement of Soil Carbon and Nitrogen Recommended Management Practices	sequestration potential of different land use in Jharkhand through Average Index Score :570
Name of the P.I.	: Dr M. V. Durai, R. O	Budget:Rs. 53.49 Lakhs
Name of Division	n: Forest Soil & Land Reclamation	Duration : 3years (2010 – 2013)
Long term objec	tives of the project	
• Enhancement of Short term object	of soil carbon and nitrogen sequestration potential or ctive of the project	of different land uses through recommended managements practices (RMPs)
 To stud impact of RMPs on physical, chemical and biological properties of soil under different land uses in Jharkhand To study impact of selected RMPs on C - and N- Sequestration stocks and dynamics of soil in different Land uses To determine sink capacity of different land uses To quantity economic improvement of different land uses under RMPs To establish a relationship between SOC, Soil Nitrogen and soil quality (w.r.t total biomass) and economic productivity of land use systems To prepare digital SOC and N stock maps with GIS and GPS tools To create awareness and disseminate gained knowledge about global climate, C-sequestration and food security to the end users through seminar/publication 		
Comments of Re	feree: -1Dr. A. K. Sarkar Dean Faculty of Agricult	ture College of Agriculture, BAU, Ranchi
TitleEvaluation of Soil Carbon and Nitrogen sequestration potential of different land use in Jharkhand through Recommended Management Practices"		
Objectives (i) Development of database for evaluation of C & N sequestration potential of different land use systems through RMPs. (ii) Monitoring the changes in different pools of C & N as well as physical, chemical and biological properties of soil a affected by different treatments. Observation :- Total C & N lible carbon, soil organic carbon, potential mineralizable N, SMBC, SMBN and mineral-N upto 6 cm soil depth. • Under different land use systems in barren land may be taken as reference for calculation of Carbon Management Index. Page 125		

Methodology	Detailed methods of analysis for soil parameters may be incorporated in the project proposal.		
	• If UV-VIS Spectrophotometer is not available in the Institute then it may be purchased. Laboratory facilities for estimation of		
	soil organic carbon may be looked into.		
	• Cost of operation of CHNS is around Rs.1000/- per sample accordingly due consideration need to be made depending on		
	availability of grants.		
Work Plan	Treatments may be modified (Tillage practice in all the treatment)		
	(a) As per the practice, (b) As per the recommendation		
	(c) As per the availability		
	(d) An integrated approach may be taken for comparison		
	The total no. of treatments may be reduced to 10 only		
Relevance to	Collaboration with other organizations depending upon the expertise in other organization may be considered as it involves		
scientific	analysis of large no. of soil samples periodically.		
excellence	Instead of CHNS analysis TOC analyzer and Total-N analysis may be considered at a much reduced cost.		
Product /	Will aid in improved knowledge for developing sustainable agricultural systems ?		
Process			
development			
Socio-	It has value for existing State of land use & improvement for long term maintenance of natural resources.		
Economic			
importance/			
Application			
oriented			
Expertise of	Bio-data of PI is not enclosed so it is difficult to comment on the expertise of PI.		
PL/ CO-PL &			
Implementing			
Institute Budgatawy	Pudget may be modified as per comments above		
budgetary	Budget may be mounted as per comments above.		
Othor	Performended for consideration after necessary modification of the project proposal		
Information If	Recommended for consideration after necessary mouncation of the project proposal.		
Referee -2Dr S	K Gangopadhyaya Principal Scientist National Bureau of Soil Survey & Land Use Planning (ICAP) Regional Centre Sector		
II Block DK C	II Block DK Salt Lake Kolkata 700.001		
- II, DIVER DR, Sait Lake, KUIRata-700 071			

IFP RANCHI

Title	"Enhancement of Soil Carbon and Nitrogen sequestration potential of different land use in Jharkhand through
	Recommended Management Practices"
Objectives	Well defined and pin pointing. However, the use of the temporal data of the satellite imagery may be added.
Methodology	Well documented and relevant.
Work Plan	Work plan is nice and systematic. However, the Seminal/ Symposia may be arranged at third year after getting the
	result.
Relevance to scientific	The project has got high relevance to the scientific excellence and it is to be undertaken on priority basis to cope up
excellence	with the present alarming situation of global warming.
Product / Process	The study will be immense helpful for developing and establishing the process which will be best for enhancing
development	carbon sequestration under different management practices.
Socio-Economic	Though it is a basic research type of study, but it is certainly application oriented so far as the socio-economic part
importance/ Application	is concerned.
oriented	
Expertise of PL/ CO-PL &	In terms of the infrastructural facilities, it is difficult to carry out the project. Again, it is found that nature of work
implementing Institute	of PL and associates are same, which is not proper. At least one expert in this line may be employed.
Budgetary details	TE may be reduced to 0.30 lakhs against 0.45 lakhs. The contingent expenditure and the field research expenditure
	may be reduced to 2.20 lakhs against 2.90 lakhs.
Other Information, If	This is a basic type of research and it will be helpful to the planers, researchers and students for developing their
	project on this line and it may be approved.

Comments of RAG: The concept of project was highly appreciated but it was felt that its implementation will be very difficult as it will not be possible to take up so many treatments in all the land use types in Jharkhand. The PI was therefore advised to recast the project proposal.

• The project objectives should focus on the prioritized research themes of the Institute. In the present form it meets the academic purpose only and is not of much utility.

• Restriction on the number of treatments to be applied.

• The land use pattern should be specified. In the present study, only one land use i.e. mined / degraded land use should be studied.

• Project title should be changed appropriately. At first studies on assessment should be conducted, than studies on enhancement should follow.

• Works carried out at BHU in the area may be consulted.

The project may be recasted in consultation with Dr. V. R. S. Rawat, Climate Change Division, ICFRE and Dr. M. K. Jamuar, Professor in Zoology, S.S. Memorial College, Ranchi.

Project No.11			
Project title: Collection	, characterization and documentation of	soil profile of different forest types in Eastern India	
		Average Index Score:520	
Name of the P.I.: Dr M	Name of the P.I.: Dr M. V. Durai, R. O.Budget: Rs. 23.73 Lakhs		
Name of Division: Fores	st Soil & Land Reclamation	Duration : 3-years (2010 – 2013)	
Long term objectives of	f the project		
• Characteriz	zation and preservation of soil profile of dif	ferent forest types in Eastern India	
 Short term objectives of the project To study physio-chemical properties of soil profile of different forest types in Eastern India To assess above ground and below ground diversity of soil biota To prepare digital soil distribution map of different forest types in Eastern India withGPS andGIS tools To preserve soil profile and establish soil monolith library at IFP, Ranchi To disseminate soil science knowledge to end users through seminar, publications etc. Comments of Referee:-1Dr. A. K. Sarkar Dean Faculty of Agriculture College of Agriculture, BAU, Ranchi			
Title	Gitle "Collection, characterization & documentation of soil profile of different forest types in Eastern India"		
Objectives	Objectives OK		
Methodology	Methodology Appropriate		
Work Plan	To be modified as : Types of forest in Eastern India can be div Contrasting soil profiles may be taken into	vided into as per location (topography) plant, climate & time.	
	GPS based soil samples should be collected	ed.	

Relevance to scientific	Relevant
excel	
lence	
Product / Process	Will help in enhanced scientific knowledge & its dissemination?
development	
Socio-Economic	Application in research & academic purposes. Collaboration with organization like JSAC, NBSS & LUP or AISS &
importance/	LUP should help.
Application oriented	-
Expertise of PL/ CO-	Bio-data or PI, Co-PI may be added.
PL & implementing	
Institute	
Budgetary details	Budget may be restricted to about Rs.15 lakh.
Other Information, If	Recommended for consideration, Infrastructure development of quality soil analysis for physical, chemical and
	biological properties should be considered.
Referee -2Dr. S. K. Gang	gopadhyaya Principal Scientist, National Bureau of Soil Survey & Land Use Planning (ICAR) Regional Centre, Sector
– II, Block DK, Salt Lake	e, Kolkata–700 091
Title	"Collection, characterization & documentation profile of different forest types in Eastern India"
Objectives	It is clear and self explanatory. However, the recycling of nutrients under different forest type should be incorporated.
Methodology	It is clear and well defined.
Work Plan	The collection of leaf, litter and raw humus layer in each of the forest profiles should be included.
Relevance to scientific	This is a Project of academic interest which has got immense scientific value so far as the soils under different forest
excellence	types is concerned.
Product / Process	Monoliths of the soils developed under different forest type are the real product of this project.
development	
Socio-Economic	The knowledge of the soils under different forest type will certainly have socio-economic importance.
importance/	
Application oriented	
Expertise of PL/ CO-	PL and CO-PL's are experienced enough to carry out his project.
PL & implementing	
Institute	

Budgetary details	Expenses under consultancy charges, field research expenses and expenses towards equipments may be reduced.
Other Information, If	The project has got scientific Importance which will help planners, researchers and students to develop plans in that area
	and it may be approved.

Comments of RAG

- The PI was advised to modify / recast the project restricting the area of study within the dry peninsular Sal Forests of Ranchi district only.
- The proposed study is too extensive. Extensive area studies by individual scientist/ Researcher in extensive area like Eastern India is meaningless. Study should be taken up in smaller area so that results are of some use.
- Area of study should be restricted within one or two districts, as taking up the study for entire eastern India is vast. The study may be conducted on a particular forest type in place of different forest types as proposed under the title.
- Project objectives should be more specific.
- Soil morphological study should be included in the study.
- Due care should be taken to avoid duplication of work already carried out by Dr. A. K. Sarkar of BAU, Ranchi.
- Project title should be modified as 'Collection, characterization and documentation of soil pedones of dry peninsular Sal forest in Ranchi district of Jharkhand and the project should be recasted in consultation with Dr. K. G. Prasad RAG member and Ex-Director, RFRI, Jorhat.

Forest Research Institute, Dehradun

Name of the P.I.: Dr. Sanjay Naithani, Scientist- E Budget : Rs. 11.82 lakh Name of Division: Ccllulose & Paper Duration : 3 Years (2010-2013) Long term objectives of the project • To evaluate the feasibility of proposed alternatives of short rotation forestry tree crops for paper making. Short term objectives of the project • To examine the physical, chemical and anatomical parameters of <i>Melia composita, Gmelina arborea</i> and <i>Prosopis cineraria</i> . • • To evaluate the pulping, bleaching and paper making characteristics. Comments of Referees: 1. Dr. R.M. Mathur, Head, Central Pulp and Paper Research Institute Post Box No -174,Paper Mill Road, Himmat nagar, Saharanpur 247001 - Comments not received. 2. Prof (Dr.) Dharm Dutt, Department of Paper Technology, (IIT- Roorkee), Saharanpur campus, Saharanpur-247001. The project is of immense importance to pulp and paper industry. The project is to be taken on priority basis. As we know Indian pulp and paper industries are facing acute shortage of cellulosic raw materials. Such project should be a regular activities of FRL The findings of the project will certainty help the paper industry to find alternate raw materials in future. I strongly recommend the project for ICFRE funding. Comments of RAG : - Recommended with following suggestions- - Include P.juliflora instead of P.sineraria. - Consult CPPRI //Star Paper Mills to prioritise spp. keeping in view the spp. which are abundantly available. - Modify the project woor	Project title : Evaluation of alternative raw materials for pulp and pape	er making. Average Index Score :703	
Name of Division: Cellulose & Paper Duration: 3 Years (2010-2013) Long term objectives of the project • To evaluate the feasibility of proposed alternatives of short rotation forestry tree crops for paper making. Short term objectives of the project • To examine the physical, chemical and anatomical parameters of <i>Melia composita, Gmelina arborea</i> and <i>Prosopis cineraria</i> . • To evaluate the pulping, bleaching and paper making characteristics. Comments of Referees: 1. Dr. R.M. Mathur, Head, Central Pulp and Paper Research Institute Post Box No -174,Paper Mill Road, Himmat nagar, Saharanpur 247001 - Comments not received. 2. Prof (Dr.) Dharm Dutt, Department of Paper Technology, (IIT- Roorkee), Saharanpur campus, Saharanpur-247001. The project is of immense importance to pulp and paper industry. The project is to be taken on priority basis. As we know Indian pulp and paper industries are facing acute shortage of cellulosic raw materials. Such project should be a regular activities of FRI. The findings of the project will certainty help the paper industry to find alternate raw materials. Such project should be a regular activities of TCFRE funding. Comments of RAG : - Recommended with following suggestions- - Include P. juliflora instead of P. sineraria. - Consult CPPRI /Star Paper Mills to prioritise spp. keeping in view the spp. which are abundantly available. - Modify the project accordinally	Name of the P.I.: Dr. Sanjay Naithani, Scientist- E	Budget : Rs. 11.82 lakh	
 Long term objectives of the project To evaluate the feasibility of proposed alternatives of short rotation forestry tree crops for paper making. Short term objectives of the project To examine the physical, chemical and anatomical parameters of <i>Melia composita, Gmelina arborea</i> and <i>Prosopis cineraria</i>. To evaluate the pulping, bleaching and paper making characteristics. Comments of Referees: Dr. R.M. Mathur, Head, Central Pulp and Paper Research Institute Post Box No -174, Paper Mill Road, Himmat nagar, Saharanpur 247001 - Comments not received. Prof (Dr.) Dharm Dutt, Department of Paper Technology, (IIT- Roorkee), Saharanpur campus, Saharanpur-247001. The project is of immense importance to pulp and paper industry. The project is to be taken on priority basis. As we know Indian pulp and paper industries are facing acute shortage of cellulosic raw materials. Such project should be a regular activities of FRI. The findings of the project will certainty help the paper industry to find alternate raw materials in future. I strongly recommend the project of ICFRE funding. Comments of RAG :- Recommended with following suggestions- Include <i>P.juliflora</i> instead of <i>P.sineraria</i>. Consult CPPRI /Star Paper Mills to prioritise spp. keeping in view the spp. which are abundantly available. Modify the project accordingly 	Name of Division: Cellulose & Paper	Duration : 3 Years (2010-2013)	
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 Short term objectives of the project To examine the physical, chemical and anatomical parameters of <i>Melia composita, Gmelina arborea</i> and <i>Prosopis cineraria</i>. To evaluate the pulping, bleaching and paper making characteristics. Comments of Referees: Dr. R.M. Mathur, Head, Central Pulp and Paper Research Institute Post Box No -174,Paper Mill Road, Himmat nagar, Saharanpur 247001 - Comments not received. Prof (Dr.) Dharm Dutt, Department of Paper Technology, (IIT- Roorkee), Saharanpur campus, Saharanpur-247001. The project is of immense importance to pulp and paper industry. The project is to be taken on priority basis. As we know Indian pulp and paper industries are facing acute shortage of cellulosic raw materials. Such project should be a regular activities of FRI. The findings of the project will certainty help the paper industry to find alternate raw materials in future. I strongly recommend the project for ICFRE funding. Comments of RAG : - Recommended with following suggestions- Include <i>P.juliflora</i> instead of <i>P.sineraria</i>. Consult CPPRI /Star Paper Mills to prioritise spp. keeping in view the spp. which are abundantly available. Modify the project accordingly 	• To evaluate the feasibility of proposed alternatives of short rotation	n forestry tree crops for paper making.	
 To examine the physical, chemical and anatomical parameters of <i>Melia composita, Gmelina arborea</i> and <i>Prosopis cineraria</i>. To evaluate the pulping, bleaching and paper making characteristics. Comments of Referes: Dr. R.M. Mathur, Head, Central Pulp and Paper Research Institute Post Box No -174,Paper Mill Road, Himmat nagar, Saharanpur 247001 - Comments not received. Prof (Dr.) Dharm Dutt, Department of Paper Technology, (IIT- Roorkee), Saharanpur campus, Saharanpur-247001. The project is of immense importance to pulp and paper industry. The project is to be taken on priority basis. As we know Indian pulp and paper industries are facing acute shortage of cellulosic raw materials. Such project should be a regular activities of FRI. The findings of the project will certainty help the paper industry to find alternate raw materials. Such project should be a regular activities of FRI. The findings of the project will certainty help the paper industry to find alternate raw materials in future. I strongly recommend the project for ICFRE funding. Comments of RAG : - Recommended with following suggestions- Include <i>P.juliflora</i> instead of <i>P.sineraria</i>. Consult CPPRI /Star Paper Mills to prioritise spp. keeping in view the spp. which are abundantly available. Modify the project accordingly 	Short term objectives of the project		
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 Comments of Referees: Dr. R.M. Mathur, Head, Central Pulp and Paper Research Institute Post Box No -174,Paper Mill Road, Himmat nagar, Saharanpur 247001 - Comments not received. Prof (Dr.) Dharm Dutt, Department of Paper Technology, (IIT- Roorkee), Saharanpur campus, Saharanpur-247001. The project is of immense importance to pulp and paper industry. The project is to be taken on priority basis. As we know Indian pulp and paper industries are facing acute shortage of cellulosic raw materials. Such project should be a regular activities of FRI. The findings of the project will certainty help the paper industry to find alternate raw materials in future. I strongly recommend the project for ICFRE funding. Comments of RAG : - Recommended with following suggestions- Include <i>P.juliflora</i> instead of <i>P.sineraria</i>. Consult CPPRI /Star Paper Mills to prioritise spp. keeping in view the spp. which are abundantly available. Modify the project accordingly. 	• To evaluate the pulping, bleaching and paper making characteristics.		
 Dr. R.M. Mathur, Head, Central Pulp and Paper Research Institute Post Box No -174,Paper Mill Road, Himmat nagar, Saharanpur 247001 - Comments not received. Prof (Dr.) Dharm Dutt, Department of Paper Technology, (IIT- Roorkee), Saharanpur campus, Saharanpur-247001. The project is of immense importance to pulp and paper industry. The project is to be taken on priority basis. As we know Indian pulp and paper industries are facing acute shortage of cellulosic raw materials. Such project should be a regular activities of FRI. The findings of the project will certainty help the paper industry to find alternate raw materials in future. I strongly recommend the project for ICFRE funding. Comments of RAG : - Recommended with following suggestions- Include <i>P.juliflora</i> instead of <i>P.sineraria</i>. Consult CPPRI /Star Paper Mills to prioritise spp. keeping in view the spp. which are abundantly available. Modify the project accordingly. 	Comments of Referees:		
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 Consult CPPRI /Star Paper Mills to prioritise spp. keeping in view the spp. which are abundantly available. Modify the project accordingly. 	- Include P. juliflora instead of P. sineraria.		
- Modify the project accordingly	- Consult CPPRI /Star Paper Mills to prioritise spp. keeping in view the sp	op. which are abundantly available.	
	- Modify the project accordingly		

Design title . Wood handing studies using yonon phase ammonic treatment technique on wood species suitable for healey blades		
rioject title : wood bending studies using vapor-phase animolia treatil	hent technique on wood species suitable for nockey blades.	
	Average Index Score :697	
Name of the PI · NK Unreti Scientist F	Budget · Rs 2 40 lakh	
Name of the Fill. W.R. Opfell, Scientist E		
Name of Division: Forest Products	Duration : 2 Years	
Long term objectives of the project		
• To widen the species base suitable for making hockey blades in order the species of the project	to help wooden sports goods industry.	
Short term objectives of the project		
To provide the technology of wood plasticization using vapor-phase ammor	hia treatment for manufacturing hockey blades to wooden sports goods industry	
Comments of Referees:		
1. Shri S.S. Rajput (Rtd. Head, Forest Products Division), 103/II, Vasant Vihar Dehradun.		
Vapour phase ammonia treatment for wood bending is simple, robust and inexpensive method as compared to steam bending presently used by sports		
good industry. Trials on species suitable for hockey blades and thereby establishing suitability of new species will be very beneficial to the industry		
which is facing difficulty in procurement of presently used <i>Morus Alba</i> . The work is of immense practical utility and will benefit the industry directly. I		
highly recommend this project for ICFRE funding. 2 Dr S.P. Singh (Rtd Head Forest Products Division) 63/3-F-6 Sector 50 Alok Vibar II Noida (U.P.) 201303		
<i>2.</i> D . S.I. Singl , (Ru. field, forest froducts Division), 0545-F-0, Sector 50, Alok Villar -II, Nolda (0.P.)-201505. Comments: (i) The supply of traditional timbers for sports industry is decreasing. This project will help in widening the species base suitable for		
making hockey blades. (ii) Fabrication and development of double cylinder wood plasticization plant will prevent. The leakage of the gas in the		
atmosphere and the technology will be transferred to hockey blade	e manufactures to replace the old boiling water technique used by the industry. (iii)	
alright and duration of the project for 2 years is justified		
unight and duration of the project for 2 years is justified		
Commont of DAC. Decommonded		

Comment of RAG:- Recommended

Project title : Interspecies hybridization between Eucalyptus pellita and	I E. urophylla and development of F1 hybrids.	
	Average Index Score :680	
Name of the P.I.: Ms. Parveen, Scientist- B	Budget : Rs. 14.16 lakh	
Name of Division: Genetics and Tree Propagation	Duration : 3 Years (2010 to 2013)	
Long-term objectives of the project		
• To increase the productivity of Eucalyptus through selection and broad	eeding for the end use.	
Short term objectives of the project		
 Evaluation of early stage hybrid vigour in the developed hybrids. Establish field trials of hybrids along with parents for evaluation of their growth performance. Comments of Referees: Professor D.K. Khurrana, Department of Genetics Resources and Tree Improvement Dr. V.S. Parmar University of Horticulture and Forestry Nauni, Solan (H.P.). 		
 Hybrid development is a continuous process and the programme needs to be developed on assembly line basis, since hybrids need to be developed as priorities change, sites change, climates change and the usage changes. The present day commonly planted Eucalyptus have found many uses in different industries and domestic products, therefore new varieties are required for specific end uses and <i>E.urophylla</i> has been are of the species used for hybridization in the many species, therefore, its hybrid with <i>E.Pellita</i> can be of utility for forest prone sites. Thus from this study some good results can be expected. Professor O.P. Toky, Professor and Dean Department of Forestry Haryana Agricultural University, Hishar Comments: Well it is useful to develop interspecies hybrids which FRI did to great success with <i>E.Camaldulesis</i> and <i>E.Tereticornis</i> in the past. I have an apprehension whether the species selected for this work i.e. <i>E. urophylla and E. pellita</i> grow well in Indian conditions, if they can, then we may think of improving them further. Tree breeding Division of FRI is competent to handle such a work, but before starting a long term period, think of the 		
Comments of RAG : - Recommended with the following suggestions:-		
 FA proposed in the project to be removed. Modify the budget accordingly. 		

Project title : Making furniture from secondary/plantation timber species for demonstration and display at different Van Vigyan Kendras. Average Index Score :678		
Name of the P.I.: A.K. Mamgain, Scientist -B	Budget : Rs. 6.00 lakh	
Name of Division: Forest Products	Duration: 2 years (2010-2012)	
Long term objectives of the project		
• To dessimate the scientific knowledge on secondary/plantation timber	for furniture making by developing prototypes.	
Short term objectives of the project		
• To develop prototypes furniture from three species for van vigyan Kendra's.		
Comments of Referees		
 Shri S.P. Badoni, (Rtd. Head, Forest Products Division), 150, Mahrecent years use of solid wood chairs is on the decline regardless of hotel and higher strata houses with personalized designer inputs. Desolid wood and "new wave" attempts are on using branches twigs an as a project incorporating designer, entho-pometric and stress balance completion of such a project inclusion of eucalyptus species for furn (package) may move to the large strata of school children aimed for (children) which are still sitting on mat in some villages. Thus the performance. The wood used for furniture should have some fire resists performance. The project can be recommended if there species pass Comments of RAG : - Recommended with the following suggestions:- 	endra Vihar, Chakrata Road, Dehradun. species and is restricted to certain high class applications using prestigious woods in evelopment of furniture is an area where the stage of near saturation is there with hd roots. As such school furniture from eucalyptus remains yet an area worth trying ce components beside aspects of seasoning and preservation. After successful hiture (school furniture) in BIS remains a task, so that results of such a project . This will generate awareness of a species to the base line of human growth broject may be casted accordingly. n, Dehradun n wood species is the need of present day as the conventional durable species are now stance. The species Kapoor may not be such and should be tested for its this test.	
Paduce the cost of the project		
Madify the project accordingly		
-modify the project accordingly.		

Project title: Studies on Taxonomy of the family Eulophidae (Hymenp	Project title: Studies on Taxonomy of the family Eulophidae (Hymenptera: Chalcidoidea) present in National Forest Insect Collection (NFIC) except	
Doon Valley		
	Average Index Score : 678	
Name of the P.I.: Dr. Sudhir Kumar, Scientist-E	Budget : Rs. 10.50 lakh	
Name of Division: Entomology	Duration : 5 Years	
Long term objectives of the project		
Exploring parasitic Eulophid (Chacidoidea) diversity present in NFIC Exploring species of biological control importance in forestry. Enrich the National Forest Insect Collection (NFIC) with this important group		
Short term objectives of the project		
To inventorize fauna of Eulophidae present in NFIC.		
Description of new species and records from the unidentified collection.		
Enrichment of NFIC with this group of insect.		
Comments of Referees		
Dr. T.D. Verma , Professor (Rtd.), Y.S. Parmar University of Horticulture Comments: Family Eulophidae is one of the largest families of super famil attacking large number of insect pests belonging to various pest orders. The proper nomenclature and taxonomic positions the Eulophid species can be identified and few of them have been studied under Indian conditions, ther fully explored. The present proposed study is likely to determine the statu various species the scope of use of its members will be explored in India a	& Forestry, Solan, Himachal Pradesh. ly Chalcidoide of order Hymenoptera. Members of this family are Small, Parasitoids uus they help in checking the harmful species population in nature. By knowing their used as biological control agents. So far, a limited number of Eulophid species are refore, their use as biological control agents of harmful agents species could not be s of this species in the Indian sub continent and with the proper identification of its nd elsewhere.	
Dr. P.K. Mehta, Deptt. of Entomology, CSK Himachal Pradesh Krishi Vi Comments of RAG : - Recommended	shva vidyalaya. Palampur-176062, Comments not received	

Project No.6		
Project title : Shisham mortality – Finding solutions for future plant	ations. Average Index Score :672	
Name of the P.I.: Dr. N.S.K. Harsh, Scientisti F	Budget : Rs. 27.71 lakh	
Nome of Division. Forest Dath als av	Drugstion + 5 man	
Name of Division: Forest Pathology	Duration: 5 years	
Long term objectives of the project		
• Identification of superior genotypes of shisham which are resistant	to diseases and stresses.	
Showt town objectives of the president		
Short term objectives of the project		
• To characterize assembled shisham germplasm in gene bank for dif	ferent genetic parameters. (Genetics & Tree Propagation Division)	
• Testing disease resistance in germplasms identified by collaborating	g divisions. (Forest Pathology Division)	
• Testing resistance to various stresses like drought, moisture and ten	nperature (Plant Physiology Discipline)	
• Genetical characterization of all the shisham germplasm lines, identification of the best clones on the basis of physiological and pathological resistance		
 To characterize different genotypes based on DNA markers and find out genetic divergence. (Genetics & Tree Propagation Division) 		
 Mass propagation of selected clones on the basis of disease and stress resistance, and better adaptability and growth performance for field testing. (All 		
Collaborating Divisions)		
Comments of Referees		
1. Professor R.C. Dubey, Department of Botany & Microbiology, Gurukul Kangri University, Haridwar - Comments not received.		
2. Professor J.K. Sharma, School of Environment and Natural Resources, Doon University, Kedarpur, Dehra Dun-Comments not received.		
Comments of RAG : -Recommended with the following suggestion:-		
-Scale down the cost of the project.		
-Remove one IRF from the proposal		

Tojee due i Study on the creet of me rearrant chemicals on	glue shear strength of plywood Average Index Score : 667	
Name of the P.I.: Ajmal Samani, Scientist-C	Budget : Rs.2.20 lakh	
Name of Division: Forest Products	Duration : 3 years (2010- 2013)	
Objectives of the project		
1. To develop economic and effective fire retardant treatment	method for plywood.	
2. To study effect of fire retardant chemicals on glue shear str	ength of plywood.	
Comments of Referees		
Dr. Indra Dev, 790/533, Near Haryana Diary, Vijay Park Extensio	n, Dehradun Comments: The study of	
ire retardant chemicals on glue shear strength of plywood is a very	good work, and in the past some scientists have carried out work in this field. The problem	
of using water soluble fire retardant chemicals is their leachability in higher humidity conditions of use. The project may be sanctioned if the treated plywood is		
ald work	the attempts should be done to develop non reachable the relations in stead of repeating the	
Dr. S.P. Singh, (Rtd. Head, Forest Products Division), 6343-F-6, S	ector 50, Alok Vihar -II, Noida (U.P.)-201303. Comments: (i) The project is very useful for	
plywood Industries and other plywood consuming organizations like shipbuilding, railways, building construction etc. (ii) Some work on these lines has already		
been done in FRI so the names of now non toxic and eco friendly fire retardant chemicals to be used under this project may be mentioned or if the new species		
are to be used for making plywood it should be mentioned. (iii) The project is technically alright. The project may be initially approved for 2 years and extended		
further if the progress is satisfactory.		
Comments of RAG : - Recommended with the following suggestions:-		
-Study the MoE and MoR also and modify the project accordingly.		

Project No.8		
Project title: Hetrogeneity study between and within species using near infra red spectroscopy and assess wood quality. Average Index Score : 666		
Name of the P.I.: Dr. Vimal Kothiyal, Scientist F	Budget : Rs.12.60 lakh	
Name of Division: Forest Products	Duration : 3 Years (2010-13)	

Long term objectives of the project

The project in long term will help in tree improvement for selection of material, sorting of timber and possibly in identification also.

Short term objectives of the project

Develop alternative NIR methods for classification of species and clones. Plantation species will be studied under the project. Identification methods for plantation species and different clones of Eucalyptus, sissoo and popular will be perfected in this project.

Comments of Referees

Dr. S.P. Singh, (Rtd. Head, Forest Products Division), 6343-F-6, Sector 50, Alok Vihar -II, Noida (U.P.)-201303. Comments: (i)The project will help in development of economic and efficient technology for processing of plantation timbers. (ii) Near infra-red (NIR) spectroscopy is the latest technology in the field of wood science and technology for rapid assessment of its chemical constituents and evaluation of physical and mechanical properties of wood and wood products. (iii) Models will be developed based on NIR spectra for classification and identification of plantation species eucalyptus, sissoo and Poplar. (iv) Project is technically sound and duration of the project for 3 yeas is justified.

Shri S.S. Rajput (Rtd. Head, Forest Products Division), 103/II, Vasant Vihar Dehradun.

Comments: Near infra red spectroscopy is a fairly new technique so far as its use in wood science & technology is concerned. It has a potential to give new dimensions to wood quality evaluation in non destructive manner. Before this could be put to practical utility, lot of R&D work is needed and proposed project is a very good beginning of a new & quick method of evaluation of wood properties & quality. This type of work needs to be encouraged.

Comments of RAG : -

Recommended with the following suggestion:-

-Take plantation timber for the study.

Project No.9		
Project title: Development of Biomass Expansion Factor (BEF) for some indigenous tree species of Garhwal Himalaya, Uttarakhand		
	Average Index Score :660	
Name of the P.I.: Dr. Laxmi Rawat, Scientist - E	Budget : Rs. 14.18 lakh	
Name of Division: Ecology & Environment	Duration : 3 Years (2010-13)	
Long term objectives of the project : N. A.		
Short term objectives of the project To assess biodiversity in different forest ecosystems. To study the impact of biodiversity on microclimate. To study the socio-ecological impacts on nearby villages.		

Comments of Referees:

- Dr. M.M. Srivastava, Head, Botany Department (Rtd.), Tapowan Enclave, Sajwan Khera, P.O. Tapowan, Dehradun 248008

 The potential for carbon sequestration is quite high for mitigating the effect of global warming. The terrestrial ecosystems are a huge natural biological scrubber for the CO2 from the various fossil fuel emissions and industrial facilities. Carbon sequestration in terrestrial ecosystem occurs in living above ground biomass. It is estimated that 10-15% of the excess CO2 in the atmosphere can be removed by creating large scale tree plantation. Such tree plantation should be encouraged in Uttarakhand for indigenous tree species.
 Biomass studies of indigenous tree species are quite essential, Lot of information is available for Shorea robusta, Eucalyptus hybrid, Populus deltoids, Dalbergia sissoo and Pinus roxburghii etc. on biomass, production and nutrient dynamic, however there is paucity of data on Oaks (Quercus spp.) & Rhododendron spp. Biomass studies on these plants could be carried out in calculating carbon sequestration potentials/ accrediting carbon credits of different ecosystems of Uttarakhand. 3). Therefore, the present title of the project could be modified as "Development of Biomass Expansion Factor (BFF) for Oaks (Quercu spp.) and Rhododendron spp. of Garhwal Himalayas, Uttarakahand? instead of its present form.
- 2. Dr. T.D. Verma, Professor (Rtd.), Y.S. Parmar University of Horticulture & Forestry, Solan, Himachal Pradesh.

The proposed study is of great ecological and environmental importance. Trees with greater biomass production have more capacity for higher carbon credibility required for climate change mitigation. Therefore, there is need to study the biomass expansion factor for already established tree species (local) for evaluating them for carbon credits. Therefore, proposed study is demand of the day. Objectives of the proposed study are clear and self explanatory. Yearly plan is also well explained but the budget estimates seem to be on higher side. As regards, the man power I feel that one RA and two field assistants are sufficient to carry out the project and under sub head 19.3 Equipments should have been clarified as it has been mentioned earlier that most of the required equipments are available in the division. Then where is the justification for allocation of Rs. 3.2 lacs for equipment.

The proposal may be considered by the ICFRE for funding after correcting the budget estimates. However, the proposal is of immense importance in view of the mitigation of climate change in the recent years.

Comments of RAG : - Recommended

Project No.10

Project title: Development of DNA-marker based technique for Pinus roxburghii and Cedrus deodara for wood/ timber forensics.

Average Index Score : 660

Tune of the Fine Di. Suntan Durthway, Scientist C	buget . R3.23.00 laki
Name of Division: Genetics and Tree Propagation	Duration: 3 Years

Long term objectives of the project - Nil

Short term objectives of the project

- Develop technique for DNA isolation from sapwood and heartwood.
- Identification and validation of suitable DNA markers for DNA –fingerprinting of wood sample

Comments of Referees

- 1. **Professor Salil Tiwari**, Dept of Genetics & Plant Breeding Govind Ballabh Pant University of Agrl. & Tech., Pantnagar 263145, Nainital Comments: DNA markers are most authentic characterization of species where morphological masses are not distinct. Proposed plan is appropriate, valid and timely to study on pine and deodara. PI is competent to execute the project. Project is recommended for sanction.
- 2. Professor D.K. Khurrana, Department of Genetics Resources and Tree ImprovementDr. Y.S. Parmar University of Horticulture and Forestry Nauni. Solan (H.P.).

Timber forensics is an emerging science in the molecular genetics field, since pilferage can not be stopped so eventually DNA markers would be the only tools which can help identify the stolen timber. This is the field which has attracted the attention of many developed countries also who have been toying with the ideas of GPS validated tags on logs under transit to limited utility. DNA markers have been successful in many other fields for validation and authenticity of the genetic material. However, these have rarely been tried in forest trees where its application has been restricted to only determination of genetic variability only. Thus the proposed kind of study in the initial stages can provide the strong base line information for a larger project late on.

Comments of RAG : - Recommended with the following suggestions:-

-Include Teak in addition to Chir pine and Deodar

-Consult NBPGR, Delhi as they have also done similar type of work.

- Modify the project accordingly.

Project No.11 Project title : Establishment of molecular taxonomy facilities and molecular characterization of selected bamboo species Average Index Score : 658 Name of the P.I.: Dr. Anup Chandra Budget : Rs.49.39 lakh Name of Division: Botany Duration : 3 Years Long term objectives of the project • DNA Bar-coding of forest tree species Short term objectives of the project • Set up of necessary infra -structure for molecular taxonomy laboratory • Set up of necessary infra -structure for molecular markers for selected Bambusa species • Standardization and preservation of voucher specimens of selected Bambusa species • Standardization and validation of molecular markers for selected Bambusa species • Standardization and validation of molecular markers for selected Bambusa species • Dornents of Referees 1. Prof. R.D. Gaur, Emeritus Professor, Plant Taxonomy, Botany Department, HNB Garhwal University, Srinagar Garhwal

Comments: The proposed plan of research is primarily aimed to strengthen the taxonomy branch by establishment of molecular taxonomy laboratory in FRI.

The DNA bar coding is comparatively a recent concept of taxonomic innovations, practically concerned with all the living beings. DNA profile of an individual does explain phenotypic as well as genotypic traits, responsible for their expression; therefore, such studies are not only essential but also accurate to sort out the problems related to long future. Further more, India is rich in species diversity of Bambuseae, particularly the Eastern Himalaya, and there are several taxa under the tribe not properly determined, on account of their mono carpic nature and rarity in occurrence, This tribe covers all the related genera under the common name "Bamboos". It is expected to unfold wider spectrum of the whole Bambuseae. The molecular techniques are sophisticated requiring very cautious handling and maintenance.

Therefore, such project could only be implemented with the support of expert biotechnicians and interpretation of DNA profile, the aim of the project could be fulfilled. Taxonomy based on molecular traits is recent discipline, essentially warranted in the well recognized institutes like FRI. By establishment of molecular taxonomic laboratory, the institute would be capable to sort out many problems of phylogenetic and taxonomic ambiguity. The referee is pleased to recommend the proposal (as modified) for financial support.

2. **Dr. P.P. Dhyani**, Scientist-F, GB Pant Institute of Himalayan Environment and Development, Kosi Katarmal, Almora, Uttarakhand. DNA bar-coding is a most powerful tool for taxonomic research. It also helps in forensic diagnosis of plants. Therefore, DNA bar-coding is essentially required not only for Bambusa species but also for other plant species. My specific comments/queries on the project proposal are as below.:

(i) What are the reasons for the selection of Bambusa species for their molecular characterization?

(ii) How many species of Bambusa will be used for their molecular characterization during the proposed period of the project? (iii) The budget proposed is on higher side and needs to be curtailed particularly under the equipment head of the project; the total budget for 3 years should not exceed Rs. 20 lakh.

Comments of RAG : - Recommended with the suggestions-

-DBT may also be approached for funding.

-Include more species of Bamboo in the project.

Project No.12

Project title : Development of micropropagation protocol for mature superior recombinants emanating from F2 generations of *Eucalyptus* hybrid *E. citrodora* Hook. × *E. torelliana* F.v. Muell.

Average Index Score : 658

Name of the P.I.: Dr. Ajay Thakur, Scientist – C	Budget : Rs. 9.59 lakh
Name of Division: Botany	Duration: 3 Years

Long term objectives of the project

• Development of micropropagation protocols for new *Eucalyptus* hybrids to enhance productivity in quality and quantity.

Short term objectives of the project

• To develop complete micropropagation protocol; that is from lab to hardening in green house, for multiplication of superior F2 recombinants of *Eucalyptus* hybrid *E. citrodora* and *E. torelliana*.
FRI DEHRADUN

Comments of Referees

1. Shri D.P. Uniyal, 1/36, Ashirwad Enclave Dehradun.

Genetics division of FRI has done lot of work on development of protocols for micro propagation of eucalyptus F1 hybrids developed at this institute involving different present species combination. Much work has been done under world bank project, protocols developed in the past for micropropagation of eucalyptus F1 hybrids E. torelhara x E. ctriodora (kapoor and chaulan 1992) and E. citriodora x E torellana (Bisht etal 2002) could be tried with little modification.
 2). In the light of facts mentioned above the

project period should be reduced to 2 years and so accordingly the budget for the project.

3) There are few grammatical mistakes in the text of project and should be rectified while submitting the revised project. 4). All the

four recombinants identified for superior growth performance my be taken to carryout this study.

5). On conclusion

of the project at least 150 plantlets of each micro propagated hybrid recombinants be produced and handed over to division of genetics and tree propagation for testing their performance in the field. 6). Technically the project is feasible.

Therefore, such project could only be implemented with the support of expert biotechnicians and interpretation of DNA profile, the aim of the project could be fulfilled. Taxonomy based on molecular traits is recent discipline, essentially warranted in the well recognized institutes like FRI. By establishment of molecular taxonomic laboratory, the institute would be capable to sort out many problems of phylogenetic and taxonomic ambiguity. The referee is pleased to recommend the proposal (as modified) for financial support.

Dr. P.P. Dhyani, Scientist-F, GB Pant Institute of Himalayan Environment and Development, Kosi Katarmal, Almora, Uttarakhand.

(i) The objective of the project is not defined more precisely.

(ii) How many plants will be produced through tissue culture during the proposed period of the project?

(iii) One of the objectives of the project should be "Field plantation and assessment of growth behaviour and biomass productivity of propagated plants".

(iv) Since the project involves development of protocol, the genetic fidelity of the in vitro raised plants and comparison of their performance with

macropropagated and seed raised plants should also be assessed.

(v) The budget proposed is on higher side and needs to be curtailed; it should not exceed Rs. 9 lakh for 4 years.

In view of above, the project is recommended for revision.

Comments of RAG : - Recommended with following suggestions-

-Time period for the project to be three years.

-150 plants of hybrid to be produced for field trials.

Project title . Study on performance of treated timbers (ZiPOC, CCP, & CCA) and their natural durability in cooling towers		
Troject title . Study on performance of treated uniders (Ziboc, CCD C	Average Index Score : 654	
Name of the P.I.: Dr. Sadhana Tripathi, Scientist-E	Budget : Rs.9.63 lakh	
Name of Division: Forest Products	Duration : 5 years (2010-2015)	
Long term objectives of the project		
• To evaluate natural durability and performance of treated timbe	r (indigenous and imported) in cooling tower.	
 To study performance of ZiBOC in cooling tower environment and its comparison with CCA and CCB in Douglas-fir (Pseudotsuga menziesii) and Pinus roxburghii (reference). To assess suitability of treated and untreated Pinus radiata in cooling tower and its comparison with Pinus roxburghii (reference). To determine threshold concentration of preservative for these species. 		
Comments of Referees Dr. Indra Dev, 790/533, Near Haryana Diary, Vijay Park Extension, Dehradun the study of durability of treated/untreated hard wood species in cooling towers has been studied in W.P. Discipline, FRI and abroad also in the past and is mentioned in the present project. The past work showed that hard wood do not perform well in cooling towers. Therefore there is no use to try a new preservation without doing laboratory trials against soft rot fungi. The project may be recommended after getting the performance report of ZiBoC against Soft rot in the laboratory. Shri S.P. Badoni, (Rtd. Head, Forest Products Division), 150, Mahendra Vihar, Chakrata Road, Dehradun. Comments: R&D work on haldu, siris, silver oak and bakain be dropped as timber availability figures as Projected in IS 1141 "classification of common commercial timbers and their zonal distribution" an old BIS publication do not however hold true due to over exploitation of above species. As such only two species like <i>Pinus radiata</i> and <i>Pinus roxburghii</i> remain to be probed with the proposed preservative formulations in which CCB and CCA are already well known with the later species (chirpine). The project is technically feasible and duplication of work is also absent due to presence of new preservative formulation. The work may be undertaken by way of funding from ICFRE or from an outside agency keenly interested in cooling towers using wood species.		
Comments of RAG : - Recommended with the following suggestions:- -Test the efficacy of ZiBOC on soft rot fungi. -Consult Dr. NSK Harsh, Head, Forest Pathology Division. -Reduce the cost by excluding unskilled workers.		

Project No. 14. RAG title – Lepidoptera of Rajaji National Park (Uttarakhand) : Assessment of species diversity of moths and butterflies across different habitat regimes and development of a database

Revised project title - Lepidoptera of Morni Hills, Haryana : Assessment of species diversity of moths and butterflies across different habitat regimes and development of a database (Modified as per recommendation of RAG)

Average Index Score : 652

Name of the P.I : Dr. A.P. Singh, Scientist-E	Budget : Rs. 7.45 lakh	
Name of Division: Entomology	Duration : 3 Years April '2010	
Long Term objectives of the project		
Assessment of lepidopteron diversity in Morni Hills, Haryana.		
Short term objectives of the project		
-To study Species and community diversity of Lepidoptera (moths and butte	erflies) under different habitat regimes.	
-To study the effect of disturbance on lepidopteron communities (disturbed	and undisturbed habitats).	
-Seasonality of Lepidoptera.		
-Larval food plants of Lepidoptera.		
-Identification of pest species of moths in amongst the species sampled.		
-Evaluation of species of conservation priority ie., threatened, protected spe	cies and species sensitive to habitat disturbance in Morni Hills.	
-Natural enemies of Lepidoptera.		
-Range extensions of Lepidoptera, if any		
-Development of a database on Lepidoptera of Morni hills		
Comments of Referees		
1. Dr. L.S. Prasad , Professor & Head, Department of Ento	mology, Sardar Ballabh Bhai Patel University of Agricultural Sciences &	
I echnology, Modipuram, Meerut, U.P.	etermined on one hand while on the other hand mother that are notential nexts and	
aculd be thread to trace (vegetation in DND will also be known as their seese	nelity lifeavale, food plonte, netural anomics will also to studied. Banga extensions	
could be threat to trees/vegetation in RNP will also be known as their seasonality lifecycle, food plants, natural enemies will also to studied. Range extensions		
or Lephopicia in Kivr will also be known during the course of this study if any. Keeping in view the significance of the proposed plan of work, the project is		
2 Dr. Majid & Khan Professor and Head Deptt, of Entomology G. B. Pamt University of Agriculture & Technology Pantnagar – 263145 (UK)		
Of the approximately 1.5 million known species of animals, butterflies and moths constitutes 1.40.000 species. Butterflies are very magnificent and the most		
colorful and conspicuous of insects. All butterflies are associated with plants. Therefore, their occurrence depends upon the presence of specific plant varieties.		
Every butterfly species has specific larval hot plant and the adults feed on the nectar of a wide range of flowers. Thus the distribution of butterfly species is		
determined by the presence or absence of specific plants on which they breed. The study will help in the assessment of diversity of Lepidoptera in RNP under		
various habitat regimes.		
Comments of RAG : - Recommended with the following suggestions:-		
-Include Morni Hills, Chandigarh in place of RNP as project site		
-Reduce budget		

Modify the project accordingly.

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Project title : Biological control of conifer nursery diseases with speica	al reference to Taxus baccata	
	Average Index Score : 65	
Name of the P.I.: Shri. Suresh Chandra, Research Officer	Budget : Rs. 4.31 lakh	
Name of Division: Forest Pathology	Duration: 3 Years	
Long term objectives of the project		
• Development of technological package for conifer nurseries.		
Short term objectives of the project		
• Collection and identification of different pathogens of conifer nurseri	ies.	
Collection and identification of ectomycorrhizal fungi associated with	h the conifer species with special reference to Taxus baccata.	
• Screening of microbial antagonists in dual culture against important p	pathogens.	
• Testing of potential ectomycorrihzal fungi and microbial antagonists	in glass house for their efficacy as biocontrol agents as well as for growth promotion.	
Comments of Referees		
1.Professor R.C. Gupta, Department of Botany, Kumaon University Campus, Almora, Uttarakhand.Comments: Taxus		
baccata a anti-cancer plant is a very important gymnosperms plant. Screening of mycoflora associated with the nursery plants and assessing their antagonistic		
interactions against the potential pathogens would reveal definitely some m	ncrobe which may prove beneficial in biocontrol.	
2. Professor R.C. Dubey, Department of Botany & Microbiology, Gurukul Kangri University Haridwar (U.A.)		
Comments not received		
Comments of RAG : - Recommended with the following suggestion:-		
-Take four sites including one site in Jageshwar and another in HP.		

Project No. 16		
Project title : Development of in vitro propagation protocol for Myrica esculenta bach - Ham. En Dehradun		
Average Index Score : 651		
Name of the P.I.: Smt. Prabha Bisht Scientist - B	Budget : Rs.8.04 lakh	
Name of Division: Botany	Duration : 3 Years	

Long term objectives of the project

• As this species cannot be propagated on mass scale using cuttings or by seeds, the protocol developed for *in-vitro* multiplication will help in conservation and large scale production of this important multipurpose plant.

Short term objectives of the project

- To standardize the technique for sterilization of the explants.
- To find out suitable media and its formulation supplemented with different cytokinins and auxin to get maximum rate of proliferation.
- To standardize *in-vitro* techniques for rooting using different auxin for *in-vitro* grown shoots.
- To standardize acclimatization and hardening procedures.

Comments of Referees

1. Dr. P.P. Dhyani, Scientist-F, G.B. Pant Institute of Himalayan Environment & Development, Kosi Katarmal, Almora, Uttarakhand)

(i) The Investigator should focus on both male and female plants separately as the response to tissue culture of both will be different.

(ii) The PI should also follow the methods that are already known for the development of propagation protocol of the species.

(iii) How many plants will be produced through tissue culture during the proposed period of the project?

(iv) One of the objectives of the project should be "Field plantation and assessment of growth behaviour and biomass productivity of propagated plants".

(v) Since the project involves development of protocol, the genetic fidelity of the in vitro raised plants and comparison of their performance with macro propagated and seed raised plants should also be assessed.

Comments of RAG : - Recommended with the following suggestions-

- Work on male and female species.

-Assess the genetic feasibility of the species.

-Ensure field plantation of tissue culture raised plants.

-Revise the project accordingly.

Project No.17

 Project title : Effect of fire on restored rock phosphate mine ecosystem
 Average Index Score : 641

 Name of the P.I.: Dr. Mridula Negi Scientist –B
 Budget : Rs. 3.12 lakh

 Name of Division: Ecology & Environment
 Duration : 3 Years

 Long term objectives of the project
 • Management of restored rock phosphate mine areas

Short term objectives of the project

- To monitor the changes in species recruitment, their composition and structure and post fire community development
- To monitor the changes in soil physical and chemical attributes

Comments of Referees

- 1. Dr. M.M. Srivastava, Ex. Head, Botany Department, Tapovan Enclave, Sajwan Khera, P.O. Tapovan, Dehradun. Comments not received.
- 2. Professor J.K. Sharma, School of Environment and Natural Resources, Doon University, Kedarpur, Dehra Dun- Comments not received

Comments of RAG : - Recommended with the following suggestions:-

-Include FA in place of JRF and modify the project accordingly.

Project No.18		
Project title : Investigations into the role of length to pitch ratio of fi	nger profiles on the flexural properties of finger jointed sections.	
	Average Index Score :639	
Name of the P.I.: Dr. Kishan Kumar Scientist-E	Budget : Rs.7.47 lakh	
Name of Division: Forest Products	Duration : 3 years (2010- 2013)	
Long term objectives of the project		
• Assessing the performance of finger joints on various wood spec	ies, with different design parameters and with different glues.	
Short term objectives of the project		
• To evaluate the effect of L/P ratio of fingers on the bending parameters of finger jointed sections made out of one soft and one hard wood. Species suggested : <i>Melia azedarach</i> (Bakain -Hard wood) and <i>Cedrus deodara</i> (soft wood)		
Comments of Referees		
1. Dr. S.P. Singh, Ret. Head, DFPR, 6343-F-6, Sector-50, Alok Vihar-II, Noida, U.P - Comments not received		
Comments of RAG : -Recommended with the following suggestion:-		
-Replace deodar by chir pine.		
-Exclude Rs. 1.80 Lakh proposed for purchase of cutters from the proposed outlay as the funds have been made available to PI during the current financial		
year.		
- Modify the project accordingly.		

Project title : Comparative assessment of wood properties in micro and macro propagated plantations of Populus deltoids.

Average Index Score : 638

Name of the P.I.: Dr. P.K. Pande, Scientist D	Budget : Rs. 8.16 lakh
Name of Division: Botany	Duration: 3 years (1 st April 2010-31 March, 2013)

Objectives of the Project

• To analyze with in tree, intra- and inter-clonal variations in micro- and macro-propagated plantation wood of different clonal ramets of *Populus deltoides* at the harvesting age.

• To compare wood properties on the basis of specific gravity, fiber and vessel morphology in micro- and macro-propagated plantation wood of different clonal ramets of *Populus deltoides* at the harvesting age.

• To analyze and correlate wood parameters with growth and together.

Comments of Referees

1. **Prof. Kulwant Rai Sharma**, Department of Forest Products, College of Forestry, Dr. Y.S.Parmar University of Horticulture and Forestry, Nauni, Solan-173220.

I strongly feel that such research work can be undertaken in FRI with well developed Anatomy Research Division. In my opinion the research proposal is original and certainly there will be no duplication of the work. The budget required and mentioned in the proposal must be recommended and sanctioned.

2. Professor Y.S. Rawat, Department of Botany, DSB College, Kumaon University, Nainital.

Comments: This is an excellent piece of research work to be carried out by the investigator. The *populus deltoides* has got immense useful features for e.g. it is extensive use in plywood, wood composite and paper industry. Keeping in view the importance of this fast growing tree species ,the research particularly related to wood element and specific gravity parameters would be helpful for ensuring the recommendation on the basis of superior wood quality for commercial plantation of this valuable tree species. Many scientists have suggested that the variability in anatomical characteristics has profound influence on properties of wood. The main objectives of the research work to be carried out would certainly generate data that will give insight for selection of better technique for raising the quality wood. The results would also be helpful for preventing and avoiding use of chemicals by industries for making the material proper for different end uses.

Comments of RAG : -- Recommended with following suggestions-

- Remove TA/FA and reduce budget accordingly.

- Include the clones from Haryana also.

-Revise the project accordingly.

Project title : Effect of improved operational parameters on hydrolysis of lignocellulosic biomass to enhance total reducing sugar yield for bioethanol production

Average Index Score : 637

Name of the P.I.: Dr. Sanjay Naithani, Scientist- E	Budget : Rs. 19.10 lakh
Name of Division: Cellulose & Paper	Duration : 3 Years (2010-2013)

Short term objectives of the project

To study improved operational parameters on lignocellulosic biomass to enhance total reducing sugar yield for bioethanol production. Long term objectives of the project

• To develop the feasible and economic viable technology to convert lignocellulosic biomass into increased yield of total reducing sugars for bioethanol production.

Comments of Referees

Dr. R.M. Mathur, Head, Central Pulp and Paper Research Institute Post Box No -174, Paper Mill Road, Himmat nagar,

Saharanpur 247001 envisages study on the effect of variation of operational parameters during hydrolysis for increased production of total reducing sugars to generate bio ethanol. This would help to develop feasible and economically viable technology to convert lignocellulosic biomass for bio ethanol production. The pine needles and lantana camara will be used as raw material for hydrolysis and fermentation of hydrolyzates to get higher yield of ethanol. The project is of relevance for utilization of biomass for production of value added products and is therefore recommended for grants.

Comments of RAG : - Recommended

Project No. 21		
Project title: Screening of Eucalyptus germplasm for disease resistance against Cylindrocladium leaf and seedling blight. Average Index Score : 632		
Name of the P.I.: Dr. Amit Pandey, Scientist E	Budget : Rs. 19.20 lakh	
Name of Division: Forest Pathology	Duration: 3 years (April, 2010 to Mach, 2013)	
Long term objectives of the project		
• To identify <i>Cylindrocladium quinqueseptatum</i> leaf and seedling blight resistant <i>Eucalyptus</i> germplasm. Short term objectives of the project		
 Testing Eucalyptus germ plasm for disease resistance against CLSB in the genetic material currently being used by state forest departments of Uttarakhand, Haryana and Punjab Screening <i>Eucalyptus</i> genetic material developed at Forest Research Institute for disease resistance against CLSB. 		

• Molecular characterization of Cylindrocladium quinqueseptatum isolates of Uttar Pradesh causing Eucalyptus seedling blight by RAPD-PCR and ITS region amplification of DNA

Comments of Referees

- 1. **Professor R.C. Dubey,** Department of Botany & Microbiology Gurukul Kangri University Haridwar (U.A.) Comments not received.
- 2. Professor J.K. Sharma, School of Environment and Natural Resources, Doon University, Kedarpur, Dehra Dun- Comments not received.

Comments of RAG : Recommended with the following suggestion:-

-Scale down the cost of the project.

Project No. 22		
Project title : Chemoenzymatic saccharification of cellulosic bioma	ss	
	Average Index Score : 631	
Name of the P.I.: Dr. P.K. Gupta, Scientist - D	Budget : Rs. 7.10 lakh	
Name of Division: Chemistry	Duration : 3 Years (2010-2013)	
Objectives of the Project		
• To carryout chemoenzymatic saccharification of cellulosic biomass.		
Comments of Referees		
1. Professor M.S.S. Rawat , Head, Department of Chemistry, University of Garhwal, Srinagar Garhwal. Comments: Investigator has proposed the effect of different media such as periodate, amines and MW and Ultrasonic treatment on the transformation degradation of cellulose structure in order to find out the reactivity of this molecule. Many workers are also working on these lines but the present proposal is well written and still the work can be carried out on the proposed lines in order to find out the cellulose crystallinity and degradation. The project is suitable for funding.		
2. Professor D.H. Sharma, Centre of Energy Studies, IIT Delhi, Hauzkhas, New Delhi Comments not received		
Comments of RAG : -Recommended		

Project No.23		
and Improvement of flowering tree species for urban-forestry.		
	Average Index Score : 629	
Name of the P.I.: Dr. Santan Barthwal Scientist C	Budget : Rs. 24.26 lakh	
Name of Division: Genetics and Tree Propagation	Duration : 3 Years	
Long term objectives of the project - Nil		
Short term objectives of the project		
Exploring potential of some exotic species for avenue planting		
Collection of germplasm of selected flowering trees		
Development of propagation techniques		
Establishment germplasm bank		
Comments of Referees		
Professor O.P. Toky, Professor and Dean Department of Forestry Haryana Agricultural University, Hishar The project duration not seem to be worth of spending of Rs. 25 Lakhs. Twelve tree species have been proposed for selection of best genotypes, but what for? To explore the germplasm for desired Characters 1 or 2 is an adequate work. Moreover, why go against the natural variability in flowering plants. I think technically the proposal is not sound, hence not favoured.		
Professor Salil Tiwari, Department of Genetics & Plant Breeding, Govind Ballabh Pant Univ. of Agri. & Techn., Pantnagar 263145, Nainital Incorporation of flowering trees in residential areas is quite important as per aesthetic value, pollution control and climate improvement. Identification of suitable tree species for different space, sunlight, depth of soil, moisture etc. Project is appropriate and systematic. PI is Competent to execute the project. Project is recommended for the sanction. Comments of RAG : - Recommended with the following suggestion:-		
-Study the branching pattern of the spp.proposed.		
-Justifiv the equipment proposed under the project.		
-Modify the budget accordingly.		

Project title : Pre RAG - Study of heavy metal content in the ambient air and there absorption by tree species in the urban area of Dehradun. Revised project title - Study of bioaccumulation of heavy metal content in the tree species in the urban area of Chandigarh. (Modified as per recommendation of RAG).

Average Index Score : 628

Name of the P.I.: Dr. A. K. Tripathi, Scientist-E	Budget : Rs. 11.23 lakh	
Name of Division: Ecology and Environment	Duration : 3 Years	
Long term objectives of the project		
• Evaluation of heavy metal bioaccumulation in tree species in Urban areas of Chandigarh.		
Short term objectives of the project		
• Seasonal estimation of heavy metals in the ambient air in urban are	as of Chandigarh.	
• Seasonal estimation of absorbed heavy metals in soil of the above m	entioned areas.	
• Seasonal estimation of heavy metals in different parts of the plants in above mentioned areas.		
Comments of Referees – Not received.		
Comments of RAG : -Recommended with the following suggestions:-		
-Consult NBRI, Lucknow		
-Make study in Chandigarh		
-Modify the project accordingly.		

Project No.25		
Project title : Field trial of borehole method of resin tapping from Chir pine of Uttarakhand for better oleresin yield.		
	Average Index Score :622	
Name of the P.I.: Dr. B.P. Tamta, Scientist-C	Budget : Rs. 4.77 Lakh	
Name of Division: Non-wood Forest Products	Duration: 3 years (April 2010 - March 2013)	
Long term objectives of the project		
• Large scale adaptation of borehole method of resin tapping in chir pine forest areas.		
Short term objectives of the project		

• Influence of tree size and site aspect on resin production.

Comments of Referee :

Prof. A.R. Nautiyal, Director, High Altitude Plant Physiology Research Center, H N B Garhwal Univ, Srinagar, Garhwal- Comments not recd.

Comments of RAG : - Recommended with the following suggestion:-

-Include FA in place of JRF.

-Carryout field trial in FRI and Mussoorie Division.

-Modify the project accordingly

Project No.26		
Project title: Pre RAG - Ecological evaluation of natural regen	eration of natural Sal forest in response to protection in Doon valley.	
Revised project title - Ecological evaluation of natural regeneration of natural Sal forest in response to protection in Kalesar Forest, Haryana.		
(Modified on the recommendation of KAG)		
	Average Index Score : 620	
Name of the P.I.: Dr. Nirmal Ram Scientist –E	Budget : Rs. 6.47 Lakh	
Name of Division: Ecology & Environment	Duration: 4 Years (April 2010-	
Long term objectives of the project		
• To study the regeneration ecology of <i>Shorea robusta</i> .		
Short term objectives of the project		
 To study the phyto-sociological attributes of protected and unr 	protected plots.	
 To study the physico-chemical attributes of soil. 		
 To study natural regeneration behaviour of sal and its associates. 		
Comments of Referees		
1. Prof. B.K. Tiwari, Dean, School of Human & Environme	ntal Sciences, North-Eastern Hill University (NEHU), Shillong-793022.	
Comments not received.		
2. Dr.U.N. Singh , Reader, Deptt. of Botany, D.V. Post Graduate College, Orai (UP). Residence:11, Teacher's Flat, Rath Road, Orai -285001. U.P.		
Comments not received.		
Change site from Utterskhend to Keleser forest in Hervene		
-Change she from Ottalakhanu to Kalesar folest ili Haryana, Modify the project accordingly		
-mourry the project accordingry.		

Project title: Validation of chemical markers conferring Cylindrocladium leaf and seedling blight resistance in Eucalyptus germplasm.		
	Average Index Score : 619	
Name of the P.I.: Dr. V.K. Varshney, Scientist-E	Budget : Rs. 6.51 lakh	
Name of Division: Chemistry	Duration : 3 Years	
Long term objectives of the project		
 To establish chemical markers conferring <i>Cylindrocladium</i> leaf and seedling blight resistance in Eucalyptus germplasm To ensure production of disease resistant quality planting stock Short term objectives of the project To validate chemical markers conferring <i>Cylindrocladium</i> leaf and seedling blight resistance in Eucalyptus germplasm. 		
Comments of Referee		
Professor M.S.S. Rawat, Head, Department of	Chemistry, University of Garhwal, Srinagar Garhwal.	
Comments: Studies on trees are considerably gaining attention by genetic	ists and other tree scientists to identify the healthy strain and genetically strong spp.	
towards the growth, yield, form, durability and resistance to pests and disc	ease etc. Several chemical markers have been identified to improve the quality of the	
trees, especially which could resist the pests and insects. In the present study the investigators have proposed to identify the markers conferring resistance to		
Eucalyptus foliage against cylindrocladium. The identified markers will also be screened against the Eucalyptus germplasm infested artificially by the fungus.		
The project is good and the proposed study will be valuable to improve the breeding program to get the healthy and disease/pests resistance tree species. In my		
opinion the project can be funded.		
Comments of RAG : - Recommended		
Comments of RAG : -Recommended		

Project title: Pre RAG – Forest enrichment trials for increasing NWFP productivity using Piper pedicellatum.

Revised project title - Field trials for increasing NWFP productivity using *Piper pedicellatum*.

Average Index Score : 614

	6
Name of the P.I.: Dr. Lokho Puni Head	Budget : Rs.8.26 lakh
Name of Division: Non-wood Forest Products	Duration: 3 years (April 2010 - March 2013)

Objectives of the Project

• The objective of the project is to carry out field trials for increasing NWFP productivity using medicinally important species, *Piper pedicellatum*.

Comments of Referees

- 1. Prof. A.R. Nautiyal, Director, High Altitude Plant Physiology Research Center, H N B Garhwal University, Srinagar, Garhwal. Comments not received.
- 2. Dr. L.S. Prasad, Professor & Head, Dept.of Entomology, Sardar Ballabh Bhai Patel Univ. of Agricultural Sciences & Tech., Modipuram, Meerut, U.P.-Comments not received.

Comments of RAG : - Recommended with the following suggestions:-

-Carryout trial in FRI and land of Uttarakhand Forest Department.

-Exclude the budget proposed for taking the land on lease.

- Modify the project accordingly.

Project No.29	
Project title : Dissemination of information and innovations of FRI	technologies among different stakeholders.
	Average Index Score : 614
Name of the P.I.: Shri.Gulab Singh Dy.CF	Budget : Rs.13.77 lakh
Name of Division: Extension	Duration : 3 Years
 Long term objectives of the project Recompilation of technologies of different divisions of FRI to be done. To consult all PCCFs and other organizations for their requirement of technologies. Dissemination to different stakeholders through training one at FRI and one at each place of area of studies. Post monitoring of technologies with feed back from stakeholders. Short term objectives of the project Recompilation of technologies of different divisions of FRI to be done. Post monitoring of technologies of different divisions of FRI to be done. Dissemination of popular technologies to state forest departments, farmers, unemployed youth, artsians, women through training, demonstration, fieldvisit, publication, video audiovisual methods, seminar & workshops etc. Post monitoring of popular technologies and feed back from stakeholders. Comments of Referees Shri A.S. Negi, IFS (Rtd.), 300, Model Colony, Araghar, Dehradun. 	
The project can be very useful as it aims at documentation of technologies of different Divisions of FRI, Hope the documentation will be done from inception to date which has not been mentioned in the project. The project does not mention about the website of FRI where all these projects must have been documented and if not, then the first and foremost task of the project should be to document them on the website for wide dissemination. The consultation process with PCCFs of different stats and post monitoring of technologies proposed in the project will need more elaboration and a process of long term consultation with state Forest Departments will have to be laid down at the end of the project based on the experience gained during the project. The emerging new threats to Forests and Environment due to global warning, forests degradation, large scale transfer of land for non forestry purposes and addressing the need for restocking of forests 2. Shri. R.K. Luna, IFS, CCF (Working Plan & M&E Research), Quiet Office No. 9, Sector 40-B, Chandigarh-160036	

- 1) Rehabilitation and restoration of degraded lands including social forestry will have to find special attention whole documenting the research projects of various divisions of FRI, There is also a strong need of documenting research done by other organizations on the above themes and disseminate the same to stake holders particularly the State Forest Department.
- 2). Under 208 "Collaboration with other institutes outside ICFRE" it is mentioned 'NIL'. It needs to be revised. Under 209 "User Target groups" only people of Uttarakhand is mentioned which does not seem correct. Keeping above points in view the budget estimates for 3 year period of the project seems to be inadequate and may need a revision accordingly.

Comments of RAG : Recommended with following suggestion:-

-Remove salary component.

-Explore possibilities of organizing Vaniki Darshan on the pattern of Krishi Darshan.

-Radio may also be used as a medium for extension.

-Modify the project accordingly.

Project No. 30.

Project title : Role of temple forests in rejuvenating microclimate of some villages of Uttarakhand.

Average Index Score : 609

Name of the P.I.: Dr. Laxmi Rawat, Scientist-E	Budget : Rs.9.00 lakh
Name of Division: Ecology & Environment	Duration: 3 Years (1010-

Long term objective of the project

• To study effects of temple forests on climate of the area

Short term objectives of the project

- Identification of villages or study sites
- Recording of climatic variables and study their role in conserving (i) microclimate and (ii) as genetic resource

Comments of Referees

1. Prof. B.K. Tiwari, Dean, School of Human & Environmental Sciences, North-Eastern Hill University (NEHU), Shillong-793022 -Comments not received..

2. Dr.U.N. Singh, Reader, Deptt. of Botany, D.V. Post Graduate College, Orai (UP). Residence:11, Teacher's Flat, Rath Road, Orai -285001. U.P. Comments not received.

Comments of RAG : - Recommended with the following suggestions-

-Manual proposed to be prepared should be translated in Hindi also.

- Reduce budget also.

-Modify the project accordingly

Project No. 31.

Project title : A field manual for the insect pests and their control in agroforestry plantations

Average Index Score : 608

Name of the P.I.: Dr. Shamila Kalia, Scientist E	Budget : Rs. 3.70 lakh
Name of Division: Extension	Duration : 3 Years

Objectives of the Project

- To undertake a comprehensive insect pest survey in the agroforestry systems in Uttarakhand, Punjab, Uttar Pradesh and Haryana and to document the insect pest associated with various agroforestry tree and crop species, their distribution and economic significance.
- To record pest population built up, forecasting and predicting insect outbreaks and suggest possible eco- friendly control wherever necessary.
- To prepare an illustrated document on insect pests, their association and distribution in various regions of Uttarakhand, Haryana, Uttar Pradesh and Punjab.

Comments of Referees

1. Dr. **T.D. Verma**, Professor (Rtd.), Y.S. Parmar University of Horticulture & Forestry, Solan, Himachal Pradesh. Comments:

Agro forestry system is unstable eco system as compared to the forest eco system due to frequent human disturbance. Therefore, the status of pest population is likely to be affected due to weak natural enemy complex system in this situation. It is therefore, all the more important to monitor pest population under this system ,as it is likely to affect more in terms of growth and productivity of the agro forestry trees. Therefore, present study is of great economic importance. However the title of the project should be modified to preparation of a guide to the insect pest diversity in plantations of agro forestry importance. The desired results can help in determining the status of various pest species under agro forestry system and their natural enemies, if any for deciding pest control programme under such specific conditions.

3. Dr. Majid A Khan, Professor and Head, Deptt. of Entomology G. B. Pamt University of Agriculture & Technology Pantnagar – 263145 (UK) Comments:

The Indian region is recognized as one the major centers of biodiversity in the world. Of the total animal species recorded globally, insects comprise at least 75 percent. The bio geographical diversity along with a rich floral diversity obviously offer favourable niches for insect-diversity in the country. The diversity is equally rich at the ecosystem level and at the species level that has been well documented by fieldwork carried out by naturalists and professional field biologists during the past. The habitat diversity offered by alpine ecosystem to tropical forest ecosystem and agro forestry ecosystem found expression in richness of faunal elements in all groups but not very well documented. The Agro forestry trees of great importance are frequently attacked by insect pests out of which some are known to have attained economic status and have been recognized as potential pests of nurseries and plantations and due to repeated attack the trees succumb to the attack. These insect pests play a decisive role in determining the productivity, resources and products. Most important issue is to protect nursery stock, keeping it healthy and free from insect damage, required for raising new plantations. It is indispensable to obtain detailed knowledge on the biology, life-

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history, seasonal history, population ecology and distribution of these insect species before any strategy history, population ecology and distribution of these insect species before any strategy is formulated. Therefore, the project proposal aims to gather knowledge about these and list out and chalk out the major as well as the minor insect pests, their damage intensity, population dynamics, seasonality and bring out and illustrated and document on the same. The bioinformatics tools developed in this project will be of immense importance for the plant protection of forest ecosystem. Hence, strongly recommended for financial support.

Comments of RAG : - Recommended with the following suggestions-

-Manual proposed to be prepared should be translated in Hindi also.

- Reduce budget also.

-Modify the project accordingly

Project No. 32.		
Project title : Taxonomic studies of parasitoids belonging to subfamily Braconinae (Hymenoptera : Braconidae) of Uttarakhanad.		
	Average Index Score : 608	
Name of the P.I.: Dr. Neena Chauhan	Budget : Rs. 1.45 lakh	
Name of Division: Entomology	Duration : 3 years April 2010-March 2013.	
 Long term objectives of the project To prepare a monograph of the sub-family Braconinae To provide better description and diagnosis of the parasitoids of the sub-family. To develop the complete information in form of DATA BASE. 		
Short term objectives of the project		
 Identification and description of unidentified braconin parasitoids belonging to subfamily Braconinae collected from the larvae of Lepidoptera, Coleoptera Diptera, and phytophagous Hymenopteran pests. To update present collection of subfamily- Braconinae in NFIC. To prepare the identification key of wasps. To record/establish insect host species of Braconinae parasitoids for utilization in biological control programme. 		
Comments of Referees		
1. Dr. T.D. Verma, Professor (Rtd.), Y.S. Parmar University of Horticulture & Forestry, Solan, Himachal Pradesh. Comments: Sub family Braconiae of family Braconidae is one the largest groups of insects with terrestrial habitats. Most members of this sub family are known ectoparasitoids of important holometabolous orders of class Insecta. They have been utilized as biological control agents world over. However, this group is poorly studied in the oriental region particularly from the Indian sub continent. Therefore, there is a lot of scope to undertake the proposed studies so as to consolidate and addition of information on this important group of insects for further use as biological control agents against various pest species. The project is technically sound with clear cut long and short duration objectives the institute and the principal investigator is capable of carrying out such studies. The technical programme and budget estimates are correct keeping in view the objectives of the study it is therefore, recommended for funding by the ICFRE.		
2. Dr. Majid A Khan, Professor and Head, Deptt. of Entomology G. B. Pamt University of Agriculture & Technology, Pantnagar – 263145 (UK) Unquestionably, taxonomy is the most important fundament to the biological control. It is the key to the field of research related to any biological control problem and can supply basic information when properly undertaken. Basic studies have a definite and highly important place in the field of biological control and should be actively supported and pursued. The order Hymenoptera is especially rich in families exhibiting the entomophagous habit and most of the parasitic species utilized in biological control belong to this order. The members of the family braconidae are very important and well recognized in the Bio control operations, but little explored. The present project is of great utility and their exploration to Uttarakhand is needed., hence project submitted by Dr. Neema Chauhan is recommended for financial support.		

Project No.	. 33.	
Project title	e: Ecological study of wetland forest ecosystem of doon va	lley (uttrakhand)
		Average Index Score : 605
Name of the	e P.I.: Dr. Promod Aggarwal Scientist –B	Budget : Rs. 5.00 lakh
Name of Di	ivision: Ecology & Environment	Duration : 3 Years (April 2010-
Objectives	of the Project	1
 To assess the decadal changes in floristic diversity of the higher plants. To study the physico- chemical characteristics of soil. To study the water quality of the study area. 		
 Dr. M.M. Srivastava, Head, Botany Department (Rtd.), Tapowan Enclave, Sajwan Khera, P.O. Tapowan, Dehradun - 248008.1). It is interesting to study the ecology of Fresh water/ Wetland Forest Ecosystems in Doon Valley. Many ecological studies were made by various workers (Kanji Lal, 1901; Dakshini, 1960, 1965, 1970 & 1974; somdeva & Ashwal, 1974; Somdeva & Srivastava, 1978; Ghildiyal, , 1986; Ashok Kumar & Srivastava, 1995; Kumar & Nandvani, 2003; Dhyani & Joshi, 2007). In the recent years the wetland forest ecosystems have been over exploited and most of them have vanished and some of the wild flora and fauna are under extinction 2) From the objectives of the project it appears that all the different aspects like the phyto sociological attributes of higher plants, physico-chemical character of the soil and water quality of different wetlands of Doon Valley were already done by various investigators. 3) In my opinion the project should be prepared in the light of conservation and management strategies so that the wetlands may be protected and conserved for future use especially for the conservation of wildlife- flora and fauna and the maintenance of their aesthetic value Prof. B.K. Tiwari, Dean, School of Human & Environmental Sciences, North-Eastern Hill University (NEHU), Shillong-793022 Comments not received 		
Comments	of RAG : Recommended with the following suggestions:-	

-Include Assan Barage and Jhilmil wetland for the study in place of the sites proposed in the project..

Project No. 34.

Project title : Studies on Taxonomy of the family Encyrtidae (Hymenptera: Chalcidoidea) present in National Forest Insect Collection (NFIC) except Doon Valley

Average Index Score : 603

Name of the P.I.: Dr. Sudhir Kumar, Scientist E	Budget : Rs. 10.50 lakh
Name of Division: Entomology	Duration: 5 Years April, 2010

Long term objectives of the project

- Exploring parasitic Encyrtidae (Chacidoidea) diversity present in NFIC
- Exploring species of biological control importance in forestry.
- Enrich the National Forest Insect Collection (NFIC) with this important group
- Enriching biodiversity of the country by describing new species of biological control importance from the region.

Short term objectives of the project

- Taxonomy (Identification, inventorization, and description of new/lesser known taxa, if any) of Encyrtidae present in the National Forest Insect Collection (NFIC)
- Inventory the species of Encyrtidae present in NFIC.
- Description of new species from the unassorted material present at NFIC.
- Redescription of inadequately described species.

Comments of Referees

- 1. Dr. T.D. Verma, Professor (Rtd.), Y.S. Parmar University of Horticulture & Forestry, Solan, Himachal Pradesh.
 - Comments: Family Eulophidae is one of the largest families of super family Chalcidoide of order Hymenoptera. Members of this family are Small, Parasitoids attacking large number of insect pests belonging to various pest orders. Thus they help in checking the harmful species population in nature. By knowing their proper nomenclature and taxonomic positions the Eulophid species can be used as biological control agents. So far, a limited number of Eulophid species are identified and few of them have been studied under Indian conditions, therefore, their use as biological control agents of harmful agents species could not be fully explored. The present proposed study is likely to determine the status of this species in the Indian sub continent and with the proper identification of its various species the scope of use of its members will be explored in India and elsewhere.
- 2. **Dr. P.K. Mehta**, Deptt. of Entomology, CSK Himachal Pradesh Krishi Vishva vidyalaya.Palampur-176062, Comments not received

Comments of RAG : - Recommended

Project No.35.

	Average Index Score : 60
Name of the P.I.: Shri. Deepak Mishra DCF	Budget : Rs. 6.00 lakh
Name of Division: Resource Survey & Management	Duration : 2 Years
Objectives of the Project	
 Development of framework for Management Appraisal for Management and economic appraisal of on -going ecotor Assessment of the level of participation and attitude of th Assessment of the financial/economic benefits of the economic communities. 	or ecotourism projects in the state. Irism projects in Uttarakhand state. e community towards ecotourism projects. otourism projects to the community and the impact of such projects on socio-economic life of th
Comments of Referees	lagarh Debradun Uttarakhand
 Shri. B.L. Dhayani, Resource Economist, CSERI, Kaulagarh, Dehradun, Uttarakhand. Comments: Introduction: Abruptly ended without emphasizing why ecotourism and not simply tourism. Objectives: (1). It is appraisal or evaluation - It can not be appraisal. (2) Soc economic impact of eco-tourism on livelihood of local community is being attempted. What about its impact on environment or micro-ecology & resource quality. Review: It is only sweeping statement & do not provide any idea about the research work conducted in this field in the past & their findings. Needs to strengthen before taking up the study. Methodology: It is jumbling one, It seems that researchers are not very clear what they intended to do and for what purpose. Therefore study area, sampling & analytical techniques given is very, general and not specific. If it has to cover the whole state, then time period is very short. Further touris at different places will have different type of impact & can finding be generalized only. Project require major recasting including time, budget, objectives, indicators etc. 	
Comments of RAG : - Recommended with the following sugge	stions:-
Comments of RAG : - Recommended with the following sugger-Study the imapct of tourism on biodiversity.	stions:-

Project No.36.

Project title : Pre RAG - Variations in soil properties and geological formations due to physiographic conditions under natural sal forest of Dehradun district.

Revised project title - Variations in soil properties and geological formations due to physiographic conditions under natural *Shorea robusta* forests of Kaleshwar, Haryana. (Modified as per recommendation of RAG)

Average Index Score : 596

Name of the P.I.: Dr. A.K.Raina, Scientist – E	Budget : Rs. 6.08 lakh
Name of Division: Forest Soil and Land Reclamation	Duration: 3 Years

Long term objectives of the project

• Management of natural Sal forests

Short term objectives of the project

- To study the mineralogical composition of soil under Sal forests.
- To study the effect of different geological parameters on Sal forests.
- To study the effects of physiographic variations on soil properties under Sal

Comments of Referee

1. Dr. Charan Singh, Sr. Scientist (Forestry), HRD&SS, CSWCRTI, Dehradun.

Comments:

Similar kind of work has already been done by many workers earlier. The similar work under same title has been carried out by FRI and published during 1985 & 86. Sal is distributed in many states therefore the study can be extended to sal growing areas also. The long term objective is not feasible and fitted well in the project proposal under the title. The investigators have not consulted the recent available literature. The recent reference used by them is of the year 1989. This showing the casual manner of the investigators. Selection of Site:- The site area where you went to carry out the research work should be confirmed with methodology which is not in the proposal.

Soil Sampling: What method will be followed for mineralogical studies was not defined which is an essential part of the experiment.

Vegetation studies: Quadrate size in very small for sal plantation and the number of quadrates per unit area is also not defined.

Statistical Analysis: This is a very strong part of the planning of any research experiment. The whole planning is based on the statistical design which is essential for data analysis but in the present case it is missing.

Comments of RAG : - Recommended with the following suggestions-

-Change the project site from Sal forest Dehradun to Kaleshwar, Haryana.

-HOD to ensure that another project on study on soil carbon for Haryana is also submitted.

-Modify the project accordingly.

Project No.37.

Project title : Study on wood anatomy of Indian shrubs for the purpose of their identification and efficient utilization.		
	Average Index Score : 593	
Name of the P.I.: Sangeeta Gupta Scientist - E	Budget : Rs.4.50 lakh	
Name of Division: Botany	Duration : 3 Years (2010-2013)	
Objectives of the Project		
1. Sectioning, staining and mounting of wood samples.		
2. To study the microstructure of the wood as per feature list given by 'International Association of Wood Anatomists (IAWA, 1989).		
3. To study the dimensional details of wood elements through maceration technique.		
4. To analyze the results of the wood anatomical parameters with regards to the systematic position of the species studied.		
5. To analyze the results of the wood anatomical parameters with regards to the ecology of the species studied.		
6. To analyze the results of the wood anatomical parameters with regards to the evolution of the species studied.		
	·	

Comments of Referees

1. **Prof. Kulwant Rai Sharma**, Department of Forest Products, College of Forestry, Dr. Y.S.Parmar University of Horticulture and Forestry, Nauni, Solan-173220. -Comments not received

2. Professor Y.S. Rawat, Department of Botany, DSB College, Kumaon University, Nainital.

Comments:

The research proposal submitted by the scientist is of immense use and beneficial for both Institution and society. No information (may be few) is available for Indian shrubs as far as microstructure details are concerned. The proposed work may certainly be conducted at FRI with well developed infrastructure and well equipped wood anatomy laboratories. The bindings of the research work would be helpful leading to efficient utilization of shrubs, both in timber and pharmacological industry. I suggest that on the basis of the importance of the shrub species, priority should be given to most important species for the detailed research work. A list of shrubs on the basis of utility must be developed and prepared. The study will also be helpful to focus upon homogeneity and heterogeneity in taxonomic classification. The study will through some light as far as conservation of some Indian shrubs is concerned. In my opinion the research work proposed certainly does not duplicate the work. The total budget proposed by the candidate must be sanctioned by the authorities

Comments of RAG : - Recommended with following suggestions-

-Include multi purpose shrubs on priority basis.

-List out the spp. to be studied.

-Modify project accordingly.

Project No.38.

Project title : Studies on the Effects of Climate Change on Plant Species Migration in transition zones of Mussoorrie Forests		
	Average Index Score : 590	
Name of the P.I.: Dr. S.P.S. Rawat Scientist -F	Budget : Rs.117.40 lakhs	
Name of Division: Climate Change & Forest Influences	Duration : 30 Years	
Objectives of the Project		
• Data collection on Plant Species Composition in transition zones	of Mussoorrie Forests.	
• Data collection on Climatic Parameters.		
• Establishing correlation between change in plant species composi	tion and Climatic Parameters.	
Comments of Referees		
1. Professor J.P.N.Rai, Department of Environmental Sciences, G.B. Pant University of Agricultural & Technology, Pant Nagar.		
Comments not received.		
2. Prof. B.K. Tiwari, Dean, School of Human & Environmental Sciences, North-Eastern Hill University (NEHU), Shillong-793022.		
Comments not received.		
Comments of KAG : - Recommended with the Tollowing suggestions:-		
-Confine the project area to a catchment.		
-Consult Dr. Nautiyal and Dr. Sharma of Garhwal Univ. so that there is no overlapping with the work they are doing.		
-Reduce the budget accordingly.		

Project No.39.	
Project title : Development of artificial diet for Dichomeris eridantis	
	Average Index Score : 589
Name of the P.I.: Shri. Lalji Prasad Scientist-E	Budget : Rs. 0.75 lakh
Name of Dvision: Entomology	Duration : 12 months

Long term objectives of the Project

• To develop artificial diet for Dichomeris eridantis

Short term objectives of the Project

- Survey and collection of *D. eridantis* larvae from the field.
- Rearing of the larvae in the laboratory
- Studies on natural insect enemies associated with the pest if any
- Preparation of the artificial diet for *Dichomeris eridantis*.

Comments of Referees

- 1. **Dr. L.S. Prasad**, Professor & Head, Department of Entomology, Sardar Ballabh Bhai Patel University of Agricultural Sciences & Technology, Modipuram, Meerut, U.P. Comments not received.
- 2. Dr. Majid A Khan, Professor and Head, Deptt. of Entomology G. B. Pamt University of Agriculture & Technology Pantnagar–263145 UK Comments not received.

Comments of RAG : -Recommended

Project No.40.		
Project title : Interaction between Pseudomonas fluorescens and AM Fungus on Dendrocalamus strictus		
	Average Index Score : 585	
Name of the P.I.: Dr. Y.P. Singh	Budget : Rs.16.76 lakh	
Name of Division: Forest Pathology	Duration : 5 years	

Long term objectives of the Project

• Development of a microbial consortium of *P. fluorescens* - AM for bamboo afforestation in wastelands.

Short term objectives of the Project

- Evaluation of population of *P. fluorescens* from soil of *D. strictus* present at different places in Punjab, Haryana, Uttarakhand and Uttar Pradesh.
- Quantitative assessment of phosphate solubilising and antagonistic (against pathogen) capacity of *P. fluorescens* and its impact on the growth of *D. strictus*.
- Study of the diversity of *P. fluorescens* and its molecular characterization.
- Interaction studies between *P. fluorescens* and AM fungus on *D. strictus*.

Comments of Referees - Not received

Comments of RAG : -Recommended with the following suggestions--Include Haryana and Punjab for the study

-Only BOD incubator to be retained as a new instrument proposed in the proposal. HOD to make available suitable refrigerator to the PI from the existing stock.

Project No.41.

Project title : Biodiversity vis-a-vis Climate Change in Garhwal Himalayas of Uttarakhand

Average Index Score : 577

Name of the P.I.: Dr. Laxmi Rawat, Scientist - E	Budget : Rs. 10.94 lakh
Name of Division: Ecology & Environment	Duration: 3 Years

Objectives of the Project

- To assess biodiversity in different forest ecosystems
- To study the impact of biodiversity on microclimate
- To study the socio-ecological impacts on nearby villages

1. Dr. M.M. Srivastava, Ex. Head, Botany Department, Tapovan Enclave, Sajwan Khera, P.O. Tapovan, Dehradun. Comments not received. 2. Dr. N.S. Bisht, IFS, Lane No. 1, Kothi No 11, Near Police Station, Vasant Vihar Enclave, Vasant Vihar, Dehradun- Comments not received Comments of RAG : - Recommended with the following suggestion:--Make the project site specific. -Modify the project accordingly. **Project No.42** Project title : Pre RAG - Vegetation changes of Mussoorie forest. Revised project title - Vegetation changes of Doon Valley. (Modified as per recommendation of RAG). **Average Index Score : 574** Name of the P.I.: Dr. Anup Chandra Scientist -C Budget : Rs.11.72 lakh Name of Division: Botany **Duration :** 5 Years Long term objectives of the project Monitoring of vegetation changes of different forest types Short term objectives of the project Survey and description of the flora of study area Photo documentation of plants of study site Comparison of present floristic diversity with previous work **Comments of Referees** 1. Prof. R.D. Gaur, Emeritus Professor, Plant Taxonomy, Botany Department, HNB Garhwal University, Srinagar Garhwal Comments: The present research proposal on the pictorial flora of Mussoorie, is timely warranted. The basic objectives of the project include survey, collection, and description of flora of Mussoorie, photo documentation through live plants and a comparison of present diversity with the previous records. A brief review has been presented by project leader and associates, to the surprise of referee, Gupta (1967) Seasonal Flowers of Indian Summer Resorts: Mussoorie Hills, and Riazada & Saxena (1978) Flora of Mussoorie Vol-1., have not been referred. The referee realizes that in the present scenario it is not a difficult task to compile pictorial flora of any region, provided the concerned scientists are really devoted to the purpose. From the presented proposal, referee implies that the flora is concerned with the flowering plants (investigators have not clarified), however, referee would like to suggest to compile the pictorial flora of all the higher groups of plants i.e. Pteridophytes, Gymnosperms and Angiosperms. 2. Shri A. S. Dogra, PCCF Punjab (Retd.), 256, Sector 37-A, Chandigarh -160036. Comments: This would enhance the value of work. Such type of study is important, particularly in context with easy accessible identification to the users (students, researchers, tourists, and all concerned with natural sciences). Scientifically the outcome of the project would be useful in addition to our Page 170

knowledge on plant diversity, sustainable utilization and conservation. The proposal is recommended for the financial support.

Comments of Referees

Comments of RAG : -Recommended with the following suggestions-

-The impact of Urbanization in the entire Doon valley area may be studied instead of Mussoorie.

-The help of the FSI may be taken. The project may be revised accordingly.

Project No.43

Project title : Refining of process for detoxification studies of Jatropha seed oil

Average Index Score : 574

Name of the P.I.: Dr. Vineet Kumar, Scientist-E	Budget : Rs. 7.56 lakh
Name of Division: Chemistry	Duration : 3 years 2010-2013

Long-term objectives of the project

- Refining of Process for detoxification studies of Jatropha seed oil Short-term objectives of the project
- Studies on detoxification of Jatropha seed oil by removal of phorbol esters.

Comments of Referees

- 1. **Professor D.H. Sharma**, Centre of Energy Studies, IIT Delhi, Hauzkhas, New Delhi Not received.
- 3. **Professor M.M.S. Rawat**, Head, Department of Chemistry, University of Garhwal, Srinagar Garhwal.

Jatropha curcus is being cultivated in the large part of India in order to get the bio fuels from its seed oil by trans-esterification methods. Besides bio fuels its oil are also being used for illumination, soap, candles and in many other products as adulterant. But the oil is not finding its application due to the presence of many toxic materials in it. Presence of phorbol esters (tetracyclic diterpenoids) are the major constraint which makes it unsuitable for the application in food and medicinal products. World over people are working on the detoxification of Jatropha seed oil. Some works have found that neutralization and bleaching led to significant reduction in phorbol esters. Some chemical treatments were also tried to remove the phorbol esters. In a similar manner the investigator has also wished to detoxify the toxic components of Jatropha oil by some chemical treatments. Therefore, the proposal is significant and should be funded. **Recommended**.

Comments of RAG : -Recommended

Project title : In vitro propagation of <i>Tinospora coratjolia</i> (Willd.) M	Aners ex Hook. F. & Thoms a multipurpose medicinal plant. Average Index Score : 57.
Name of the P.I.: Prabha Bisht Scientist B	Budget : Rs. 3.48 lakh
Name of Division: Chemistry	Duration : 3 years 2010-2013
 Long-term objectives of the project As this species cannot be propagated on mass scale using cuttings and large scale production of this important multipurpose medicin Short-term objectives of the project To standardize the technique for sterilization of the explants. To find out suitable media and its formulation supplemented with To standardize <i>in-vitro</i> techniques for rooting using different aux To standardize acclimatization and hardening procedures. 	s or by seeds, the protocol developed for <i>in-vitro</i> multiplication will help in conservation hal plant. h different cytokinins and auxin to get maximum rate of proliferation. kin for <i>in-vitro</i> grown shoots.
 Comments of Referees 1. Shri D.P. Uniyal, 1/36, Ashirwad Enclave Dehradun Literature is available on micropropagation of Tinospora cor available for rapid clonal propagation of Tinospora cordifolia refexplants may not be required for which fund amounting 7 lakh is 	rdifolia.Protocols areferences already quoted by the PI.3). Using differents required.4). Technically
 nothing much is expected from this project. 3. Prof. R.D. Gaur, Emeritus Professor, Plant Taxor Comment: The present proposal on the micropropagation of availability of the raw material to fulfill the requirement of herb indicated by National as well as State Medicinal Plant Boards. It protocol for the <u>in vitro</u> propagation throut This plant is highly medicinal on account of various bioactive con near future progressing towards extinction. The technology for the of raw material for drug industries. To some extent, it would be supportive in extension linkages, por for process or product patent. The proposed project is recommented by the support of the proposed project is recommented. 	nomy, Botany Department, HNB Garhwal University, Srinagar Garhwa <i>Tinospora cordifolia</i> is in supportive to its conservation, sustainable utilization and bal industries. The concerned plant specie is one of the 32 prioritized medicinal species. Micro propagation of this plant has been initiated by some workers; however, a standard 1gh different explants is still needed, for mass production pompounds; therefore, at present it is highly exploited from the natural habitats, and in the rapid in vitro propogation of the plant would provide efficient strategies for availability overty alleviation of rural folk, environmental conservation and there are possible scope ided for the financial assistance.

Project title : Development of micropropagation protocol of Rhododer	ndron arboreum Smith: state tree of Uttrakhand	
	Average Index Score :572	
Name of the P.I.: Dr. Ajay Thakur Scientist – C	Budget : Rs.9.87 lakh	
Name of Division: Botany Division	Duration: 3 Years	
Objectives of the Project		
To develop micropropagation protocol of <i>Rhododendron arboreum</i>		
Comments of Referees		
 Dr. P.P. Dhyani, Scientist-F, GB Pant Institute of Himalayan Environment and Development, Kosi Katarmal, Almora, Uttarakhand. Comments not received. 		
Comments of RAG : -Recommended with the following suggestions:-		
-Consult BSI centers at Sikkim and Shillong for the work being done by the scientists there and consult the literature of BSI also.		
-Reduce the budget.		

Project No.46		
Project title: Development of Nursery and planting techniques of fiber yielding Himalayan Nettle.		
		Average Index Score : 567
Name of the P.I.: Shri. S. R. Baloch R.O.	Budget : Rs. 5.5 lakh	
Name of Division: Non-wood Forest Product	Duration : 2 Years	
Long-term objectives of the project: To ensure sustainable production and utilization of Himalayan nettle (<i>Girardinia heterophylla</i>) fibre. Short –term objective of the project : To develop nursery and field planting techniques of Himalayan nettle- <i>Girardinia heterophylla</i> .		

Comments of Referees

- 1. **Professor A.K.Raina**, Head, Department of Environmental Sciences, University of Jammu, Jammu Tawi. Comments not received.
- 3. **Professor Nautiyal**, Director, High Altitude Plant Physiology Research Center, H.N.B. Garhwal University, Srinagar Garhwal. Comments not received.

Comments of RAG : - Recommended with the following suggestion:-

-Develop nursery/cultivation techniques only

-Reduce project period for 2 years and reduce the cost accordingly.

-Modify the project accordingly.

Project No.47

Project title: Pre RAG - Establishing Germplasm Garden of Some RET (Rare, Endangered and Threatened) Taxa of Uttarakhand. Revised project title - Establishing Germplasm Garden of Some RET (Rare, Endangered and Threatened) Taxa of some lesser known plants (LKT). (Modifies as per recommendation of RAG).

Average Index Score : 561

	6
Name of the P.I.: Dr.Anita Tomar Scientist C	Budget : Rs. 11.74 lakh
Name of Division: Silviculture	Duration : 4 Years

Long term objectives of the project:

• Establishment of Germplasm garden of LKP their documentation and publication.

Short term objectives of the project:

- Establishment of a Lesser Known Plant germplasm garden of superior genetic material.
- Development of Seed technology of RET(Rare,Endangered and Threatened) Lesser Known Plants to develop suitable protocol and to Promote ex-situ conservation.
- To maintain a nursery with good quality viable planting materials of proposed Lesser Known Plants.
- Documentation and Publication of Booklet of some proposed priority species of LKP with cultivation tips in order to create awareness.

Comments of Referees

1. Shri R.K. Luna, IFS, CCF (Working Plan & M&E Research), Quiet Office No. 9, Sector 40-B, Chandigarh-160036 The project should better be on rare, endangered and threatened species only to and maintain their viable populations in the germplasm banks for future reference /uses/technological development. By including LKP, the project proposal shall be diluted in its purpose of in situ conservation LKP may have

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abundant populations at some places and lesser known because of their little economic value. The need of the hour is to save the RET species. The investigator has not given any criteria for selection of species and a casual approach has been suggested. There is no scale available also to identify/prioritize Lesser Known species, therefore, only the species which we known to be under threat and need conservation should be selected for the study. No budget estimates are suggested for establishment of germplasm banks/gardens.

2. Shri R.A. Singh, IFS (Rtd.), Ex. PPCF, Himachal Pradesh, Village Mansar, P.O. Sologada, Solan (HP)

The project should be revised and confined to the threatened species of the Himalayan region, in which the institute is situated.

Comments of RAG: Recommended with the following suggestions:-

-Consult Dr.. Dhyani and Dr. V. Chandra for species selection.

-Reduce the cost of the project.

-Ensure that there is no duplication of work.

Project No.48	
Project title : 29. Daily collection and analysis of climatic data of New Forest, Dehradun.	
	Average Index Score : 552
Name of the P.I.: Dr. Nirmal Ram Scientist-E	Budget : Rs.12.10 lakh
Name of Division: Ecology & Environment	Duration : 4 Years
Long term objectives of the project	
• To assess the climatic variability.	
Short term objectives of the project	
 To maintain forest meteorological observatory for daily collection of meteorological data, analysis and compilation for use by different researchers of FRI and other organizations To determine rainfall erosion index. 	
• To upgrade the present Met. Observatory of FRI	

Comments of Referees

Prof. Y.S. Rawat, Department of Botany, D S B College, Kumaon University, Nainital.

I have go through the detailed research proposal developed by the investigators. As mentioned in the section dealing with the importance of the proposed project that the meteorological data is very important for the set up of baseline information. I agree with the above mentioned statement. I suggest that the investigators must incorporate some research work in the proposal so that the meteorological information can be used to correlate the findings. For example impact of climate change on forests of India, impact of climate change on carbon sequestration rate or relationship of climatic data with research which will be carried out of the investigators. The research plan must be developed while developing and enhancing facilities related to any weather station. I, therefore, suggest that the original research plan should be developed by the investigators and the proposal should be resubmitted for further consideration.

Comments of RAG : -Recommended with the following suggestions:--Incorporate the provision of comparison with IMD observatories in the city and Selakui. -Modify the project accordingly.

Project No 40		
Project title: Study of field performance of <i>latropha curcas</i> in Uttarakhand, analysis of factors responsible for variation and development of		
pollarding/ pruning schedule.		
	Average Index Score : 548	
Name of the P.I.: Dr. Dinesh Kumar Scientist E	Budget : Rs. 9.16 lakh	
Name of Division: Silviculture	Duration : 3 Years	
Long term objectives of the project:		
• To assess the performance of <i>Jatropha curcas</i> in the field and provide scientific inputs to tackle problems in its cultivation		
Short term objectives of the project:		
• Study of field performance of <i>Jatropha curcas</i> in Uttarakhand		
 Analysis of factors responsible for variation 		
• Development of pollarding/ pruning schedule		
Comments of Referees		

Shri R.A. Singh, IFS (Rtd.), Ex. PPCF, Himachal Pradesh, Village Mansar, P.O. Sologada, Solan (HP) Comments not received

Shri G.P. Maithani, Rtd. Director, FRI, Vill. & Post OfficeBadripur, Opp. Asha Nursing Home, Dehradun 1).

As far as working on pollarding and pruning of Jatropha for enhancing seed production is concerned academically there can be no objection. Similarly investigating other parameters vis-a-vis seed quality and production as are academic exercise also can not be objected upon. But from ecological and socio economic angles using land both in forestry and non-forestry sectors for planting/ cultivate/ proliferating Jatropha is likely to prove disastrous. There are much better ways of increasing productivity for social usage with much less inputs and much higher ecological and socio-economic gains.

2). Jatropha is going to harm production of social goods and services like grazing firewood, fodder, medicinal plants, vectors of pollination and dispersal edible under ground vegetative parts etc. Looking to high commercial viability and ready marked food grain reproduction may suffer due to diversion of land more over at present it is not know what will happen after first production cycle to the land.

3. Historically FRI has served industrial and commercial sectors more than social sector eucalyptus and poplar are examples of this now Jatropha is ready to follow the sequence. 4). As far as this exercise is concerned the period of the project is grossly inadequate selecting sites laying out the control and treatment for each variable soil as per, altitude, crop age, spacing, climate intensities of pruning/pollarding, time etc. are going to take lot of time. Waiting for production and making statistically sufficient number of collection will require sufficient time more over studying growth rate studying effects of site condition effects as ameliorative action are all long time consuming studies so the project period should much be been than 5 years at the first instance.

Comments of RAG : -Recommended with the following suggestions:--Sampling design to be given. -Study growth of the spp. also after consultation with statistician

Project No.50

Project title : Creation of seed production area and commercial cultivation trials of Uraria picta.

Average Index Score : 542

Name of the P.I.: Dr. A.K. Sharma Scientist-D	Budget : Rs. 8.828 lakh
Name of Division: Non-wood Forest Product	Duration: 3 years (April 2010 - March 2013)

Long term objectives of the project:

• Creation of Seed bank of *Uraria picta* for promoting commercial cultivation and planting material supply.

Short term objectives of the project:

- To establish Seed Bank of *Uraria picta*
- To undertake Cultivation Trials
• To Estimate Economics of Cultivation

Comments of Referees

Dr. Y.K. Sarin, C-21, Chandralok Cottage, Dehradun.

Uraria picta Desr ex DC an erect to have permanent roots is the source of Ayurvadic crude drug *Prishripazni* a dasmool ingredient is a Cardiac /nervinelonic the plant through widely distribution in eastern and south eastern in India, occurs sparsely in arid and in scattered and largely interrupted fashion throughout India. This has resulted in a very low availability of the drug. The work contemplated in the project under consideration may yield productivity results which may lead. to filling up the gap between demand and supply of the root sold under the name *pithwan mool*. The natural habitat of the plant is mostly under dry Sal forest and old alluvial flood plains of rivers and rivulets. The studies proposed may give a new plant suitable for growing in the forest floor . This will open up new opportunities for stake holders for additional source of income. Chemical studies though done still require easier studies specially in case of ecotypes. This may be included in the study.

Shri S.P. Badoni, (Rtd. Head, Forest Products Division), 150, Mahendra Vihar, Chakrata Road, Dehradun. - Comments not received

Comments of RAG : -Recommended with the following suggestions:-

-Study the demand of the spp.

- Include two unskilled worker only under proposal in place of proposed manpower.

-Modify the project accordingly.

Project No.51		
Project title : Development of tools for planting cuttings in nursery, est properties and cellulose content of promising clones	ablishment of multilocation clonal trial and study of wood anatomical of <i>Populus deltoids</i>	
	Average Index Score : 541	
Name of the P.I.: Dr. Dinesh Kumar Scientist E	Budget : Rs.14.41 lakh	
Name of Division: Silviculture	Duration : 3 Years	
Long term objectives of the project		
• Development of superior clones of <i>Populus deltoides</i>		
• Addressing technical problems related to growing of <i>Populus deltoi</i>	des	
• Establishment of clone bank of <i>Populus ciliata</i> .		
Short term objectives of the project		
 Development of tools for planting cuttings in nursery of <i>Populus deltoides</i> Development of nursery technique for field planting of <i>Populus deltoides</i> during monsoon season in stress site 		
• Establishment of multilocation clonal trials of <i>Populus deltoides</i>		
• Study of wood anatomical and physical properties and cellulose content of promising clones of <i>Populus deltoides</i>		
• Establishment of clone bank of <i>P. cittata</i>		
Shri R.K. Luna, IFS, CCF (Working Plan & M&E Research), Ouiet Office	No. 9. Sector 40-B.	
Chandigarh-160036		
(1) The main title of the project should preferably be establishment of multil	locational trials and study of wood properties. Tools can be developed without this	
project also. (2) There is no mention that how many multilocation trials, sha	ll be laid out, as the cost of the project shall be directly proportional to the number of	
trials. Moreover, no cost component of the maintenance of trials has been provided. (3) At 3 years, it will be too less to evaluate the properties of wood.		
Shri R.A. Singh, IFS (Rtd.), Ex. PPCF, Himachal Pradesh, Village Mansar, P.O. Sologada, Solan (HP) – Comments not received.		
Comments of RAG : - Recommended with the following suggestions:-		
-Reduce budget.		
-Include Populus ciliata also and choose one stress site for the study.		

Project title : Training and capacity building of field functionaries and rural communities of Garhwal Himalaya, Uttarakhand.

Average Index Score : 537

Name of the P.I.: Shri. J M S Chauhan Scientist-B	Budget : Rs. 9.60 lakh
Name of Division: Botany	Duration: 2 years

Short term objectives of the project

- To carry out training programmes on activities concerning capacity building and awareness with regard to the conservation and management of forest resource of economic value.
- To develop extension material (brochure, booklets, handouts, prefaerably in local language/dialects, documentaries etc.) for dissemination..

Long term objectives of the project

• Creating awareness, capacity building, extension for different communities, departments in strategic localities of the Garhwal Himalaya.

Comments of Referees

Shri A.S. Negi, Retired Additional Principal Chief Conservator of Forests, Retired from Uttarakhand Forest Department, 300 Model Colony Araghar, Dehradun The research project has useful research theme as it aims at training and capacity building of field functionaries and rural communities of Garhwal Himalaya through its field research station recently set up at Khirsu in Pauri Garhwal. It aims at dissemination of knowledge about survey, propagation, conservation and sustainable utilization of various local species of fuel, fodder, food, medicine, ornamental values. The proposal is very sketchy and does not specify either the species about which the dissemination of knowledge is proposed or the groups to whom the training is to be given for their capacity building. In a two year proposal it will be necessary to specify the species for which brochure, booklets, handouts are proposed to be developed as specified in the objectives of the proposal. The technical programme given in the form of annexure at the end of the proposal does not indicate any details and is very brief and general. It would be desirable to choose few species in each category (fuel, fodder, food, medicine, ornamental) according to their importance in that area and specify in the proposal. What is the status of the chosen species with regard to their availability and utilization in a particular area and what is the gap in their knowhow, which is proposed to be enhanced through this project? The target groups have also not been specified except the State Forest Department. Capacity building of different target groups will depend on their role in management and utilization of the species. Forest Panchayats locally known as Van Panchayats (VP) which are legally constituted bodies could be one of the most important target groups who are managing large number of Forest Panchayats in Uttarakhand. There are over 2400 Van Panchatyats in Pauri Garhwal district alone constituting 20% of the total number of VPs in Uttarakhand. Total area under these VPs is about 52814 hectare. Van Panchayat Committees have been constituted in all these VPs and there is a provision in Uttarakhand VP rules 2005 that Management Plan of all these VPs will be drawn up by respective Forest Divisions. Forest Divisions responsible for drawing up Management Plans for these VPs in Pauri district are DFOs Garhwal, Soil conservation Lansdowne, Civil Soyam Pauri and Lansdowne Divisions. It would be appropriate to target Van Panchayats and field

FRI DEHRADUN

Staff of the above forest Divisions for training and capacity building so that they could be able to prepare the Management plans for VPs which are not being prepared due to lack of training and capacity. The Van Panchayat Programme is under an officer of the rank of Principal Chief Conservation of Forest in the department. Khirsu and Pabo Development blocks which are adjacent have 80 and 145 VPs respectively and depending upon the project period and availability of funds the research proposal could start with these two blocks and extend to other blocks in subsequent years. This could be a very useful research proposal which could be continued in future. Uttarakhand Forest Development Corporation is doing collection and sale of medicinal and aromatic plants. This could be another target group along with the collectors of these materials. Local active NGOs could also be located for training and capacity building. The proposal could be made very useful on the above lines which could be a model research proposal looking at its usefulness as a whole for the state and its residents.

2. Suggested revision.

Comments of RAG : - - Recommended with following suggestions

- Carry out need assessment and develop study material accordingly.

-Prepare budget as per the norms of VVKs.

-Revise project accordingly.

Project No.53 Project title : Vegetative propagation of some difficult-to-root commercially important tree species. **Average Index Score : 529** Name of the P.I.: Dr. Dinesh Kumar. Scientist E Budget : Rs. 7.88 lakh Name of Division: Silviculture **Duration :** 3 Years Long term objectives of the project • Development of technology for cloning of hard-to-root species Short term objectives of the project Induction of rooting in branch cuttings of selected species Induction of rooting in intact branches of selected species through air layering Study of grafting in selected species Study of budding in selected species ٠ **Comments of Referees** Village Shri. G.P. Maithani, Badripur, Apposite Retd. Director, FRI, & Ρ 0 Asha Nursing Home. Dehradun. Comments: Genuine problem is being taken up for solving but cost effectiveness and field applicability must be looked into actual use of techniques developed should be demonstrated in field long term monitoring and evaluation in the field are necessary commercial importance of Lagestromia parviflora may be examined .

Dr.U.N. Singh, Reader, Deptt. of Botany, D.V. Post Graduate College, Orai (UP). Residence:11, Teacher's Flat, Rath Road, Orai -285001. U.P. Comments not received

Comments of RAG : -Recommended with the following suggestions:-

-Exclude JRF from the proposal.

-Consult Silviculturist Haldwani about the work done by Uttarakhand on the proposed spp.

-Revise project proposal accordingly.

Project No.54

Project title : Pre RAG – Nodulation, nitrogen fixation and root initiation studies in Myrica esculenta Ham.

Revised project title - Vegetative propagation, nodulation and nitrogen fixation studies in *Myrica esculenta* Ham.- a non legume nitrogen fixing species. (Modified as per recommendation of RAG).

Average Index Score : 528

Name of the P.I.: Dr. S.P.Chaukiyal, Scientist-C	Budget : Rs. 10.96 lakh
Name of Division: Botany	Duration : 4 Years

Long term objectives of the project

- Studying the potential of the species for vegetative propagation to be useful in quality planting material.
- Utilization of nitrogen fixing plant will be useful for improvement of soil fertility and overall productivity of the area.

Short term objectives of the project

• To study the rooting behaviour in stem, root cuttings along with hormonal treatments. 2. Performance of Myrica esculenta seedlings planting out in the field.3. Effect of nitrogen fertilizer on growth, nodulation and nitrogen fixation activity in Myrica esculenta. Production of good planting material for plantation.

Comments of Referees

1. Dr. P.P. Dhyani. Scientist-G, G.B Pant Institute of Himalayan Environment, Kosi, Katarmal.

- (i) In place of objective No. 2 and 3, the 2nd objective of the project should be "Field plantation and assessment of growth behaviour and biomass productivity of seed and cuttings raised plants".
- (ii) Why nitrogen fertilizer will be used when the species is nitrogen fixing?

(iii) After studying the nodulation behaviour and nitrogen assimilation of cutting vis-a vis seedlings raised plants of Pongamia pinnata in relation to growth and seasonal variations, what will be the future thrust area for further R&D interventions.

In view of above, the project proposal is recommended for revision. Recommended.

 2. Professor Y.S. Rawat, Department of Botany, DSB College, Kumaon University, Nainital. – Comments not received Comments of RAG : -Revise the title of the project as "Vegetative propagation of M. esculenta. 	
-Modify objectives accordingly.	
-Reduce budget.	
Project No. 55	
Project title : Pre RAG –Study on the Ethno – medicinal plants used we Revised project title - Ethnobotanical studies in Uttarakhand with species	eather Tharus. ial reference to medicinal plants (Modified as per recommendation of RAG). Average Index Score : 520
Name of the P.I.: Dr Veena Chandra, Scientist F	Budget : Rs.7.00 lakh
Name of Division: Botany	Duration : 3 years
 Objectives of the Project To scrutinize the literature for use of plants for medicinal purpose To inventorize and document ethno medicinal plants used by the vaidhys, tribals/non tribals of the state To select lesser known ethno medicinal plants To collect and introduce rare ethnomedicinal plants for <i>ex situ</i> conservation To recommend plants for chemical analysis for active principles 	
 Comments of Referee Prof. R.D. Gaur, Emeritus Professor, Plant Taxonomy, Botany Departm project is aimed to explore and document ethno-medicinal plants used by would be introduced for <u>ex-situ</u> conservation and a few others are to be r important in the health care of various societies and one of the important before it is completely vanished with the process of advanced civilization 	nent, HNB Garhwal University, Srinagar Garhwal The proposed y Tharus of Uttarakhand and U.P. Based on the survey, some of the selected plans recommended for chemical analysis. Undoubtedly traditional medicinal systems are t tasks before the present elite societies is to trap and record this inherited knowledge, n.

The indigenous health care systems are important in supplementing our knowledge in alleviating common ailments, as well as in retrieving the knowledge of primitive populace. In terms of biodiversity conservation, sustainable management of resources and poverty alleviation through such type of knowledge are closely linked with the rural population. Project leader has given wide spectrum on the review of litreature, however, a large number of workers from U.P. and Uttarakhand remained unnoticed. Census 2001 of Govt. of India has not been consulted, which described the various tribal populations of U.P. and Uttarakhand, including Tharus and their areas of habitation. This part of objective can also be achieved from anthropological literature. Simply identification of plants used by Tharus is not sufficient, it was reported by many authors as also revealed by PI, therefore, the referee would like to suggest to have greater attention of ex situ conservation of some threatened plants and to have viable collaboration with phytochemists to sort out active principles of

some little known medicinal plants.

Comments of RAG : -Recommended with the following suggestions-

-Prepare a project on the ethanobotany of Uttarakhand in consultation with NMPB, Ayush, Vaidhs and literature.

-Study ethanobotany in respect of both the tribal and non tribal.

-Revise the project accordingly.

Project No. 56

Project title : Econometric Evaluation of Potentials and Constraints of Medicinal Plant Cultivation of Uttarakhand.

Average Index Score : 514

Name of the P.I.: Shri. Jawaid Ashraf Scientist - B	Budget : Rs. 6.77 lakh
Name of Division: Statistical	Duration: 4 Years

Objectives of the Project

- To analyses the linkages between the production of medicinal plants with the internal (household or individuals) and external (state level) resources.
- To identify the constrains for the production of medicinal plants through econometric analysis.

Comments of Referees

Shri. B.L. Dhayani, Resource Economist, CSERI, Kaulagarh, Dehradun, Uttarakhand.

Comments: Study is

planned on very poor review work. Neither objectives nor methodology part is clear. Uttarakhand states as a whole has been selected as a target domain where a large variety of medicinal plants are under cultivation. There is a research gap in many medicinal plants being cultivated in the region. Covering complete gamut of medicinal plants under study will lead to journalistic findings only and will be of little use either for researchers or policy planners. Study may be recasted focusing on specific target area/population/plant species and find out different levels of yield gap and constraints in production and marketing. Multistage Stratified Simple Random Sampling technique will be more appropriate than simple SR. Appropriate econometric tool for combining continuous/discrete/dummy variables is to be adopted for such type of studies. The study should aims to suggest proper blending of food and medicinal plants to maximize income, production or many more objectives of primary stakeholder.

Comments of RAG : -Recommended with the following suggestions:-

-Confine the study to area in Munshiyari area in Pithoragarh District

-Consult Dr. Sundriyal of HRDI Gopeshwar.

- Reduce budget accordingly.

Project title : Development of site specific medicinal plant based agro- forestry models for existing plantations in Eastern Uttar Pradesh and establishment of demonstration model.

Average Index Score : 508

Name of the P.I.: Dr. B.K. Pandey, Scientist 'C'	Budget : Rs. 10.65 lakh
Name of Division: CSFER Allahabad	Duration: 3 Years

Long term objectives of the project

• Development of medicinal plant based multitier agroforestry models for Uttar Pradesh

Short term objectives of the project

- Standardization of location specific agro-practice for medicinal plants under monoculture and tree-crop intercropping with selected tree species.
- To study crop interactions within the components of the Agroforestry trials.
- To study the impact of medicinal plants on adoption of agroforestry models.
- Establishment of models on farmers fields
- Training and Extension of developed medicinal plant based Agroforestry models.

Comments of Referees:

1. Not received.

2. Not received.

Comments of RAG : - Recommended with the following suggestion:-

-Check the tree species being proposed in the project for suitability.

Project title : Pre RAG - To Study the Markets of Important tree Species for development of Agro forestry in Eastern Uttar Pradesh

Revised project title - To Study the Timber Markets of Important Agro forestry Species in Eastern Uttar Pradesh. (Modified as per recommendation of RAG).

Average Index Score : 503

Name of the P.I.: Dr. Anubha Srivastav Research Officer	Budget : Rs. 11.50 lakh
Name of Division: CSFER Allahabad	Duration: 3 Years

Long term objectives of the project

• To develop a database for facilitating market linkages of agro forestry produce between traders and farmers.

Short term objectives of the project

- To study the existing markets of important timber species in selected districts of Eastern U.P.
- Survey of farmers /growers having marketable timber in the study area.
- To prepare a database of selected tree species and growers for establishing the market linkages.
- Extension of established market linkages to the farmers and traders .

Comments of Referees

Dr. N.S. Bisht, IFS, Lane No. 1, Kothi No 11, Near Police Station, Vasant Vihar Enclave, Vasant Vihar, Dehradun. Detailed comments: The project must clearly bring out following information:a. Market survey- District wise details of the saw mills and other wood based industries - Species wise annual demand of wood by different sectors - Species wise source of wood supply in various district timber markets- Species wise supply of wood made available by forest department/forest corporation- Details of other sources of wood supply in all major markets of the region such as imported wood from abroad, import of wood from other states of the country and indigenous wood- Price range of different species and seasonal variation thereof- Marketing channels operational in the region, percentage of profit taken by various market functionaries at different levels b. Farmer's survey- The methodology of selection of farmers, sampling design and sampling intensity in different district is not mentioned. - Strengthening of market linkages as suggested by using online directory may not be feasible for the farmers. If possible efforts should be made to generate information in hard form and send it to interested farmers, saw mills, industries and other stakeholders free of cost. **Has doubt.**

Shri R.K. Luna, IFS, CCF (Working Plan & M&E Research), Quiet Office No. 9, Sector 40-B, Chandigarh-160036

Comments: The investigator is not clear about the objective of the study and the likely output for management of wood market. He should clearly define the need, objectives, input and output of the study. The wood market is mostly affected by the socio-economic factors, holdings of the people, supply and demand and the capacity of the buyers. The study has further to be related to the development scenario in the country, the technological developments and the free market conditions. Further fuel wood and timber markets will have different scenarios under different socio-economic conditions of the people. The proposal

does not suggest the methodology to be adopted for such scenarios. Moreover, 5 year duration is a long term and should be curtailed to 2-3 years. - Has doubt.

Comments of RAG : -Recommended with the following suggestions:-

-Reduce the manpower and accordingly reduce budget also keeping outlay below Rs. 10 Lakh.

-Reduce time period.

-Reduce manpower & budget

-Consult Statistician to develop sampling design.

Project No. 59		
Project title : Data compilation of R & D in medicinal and aromatic pla	ants by ICFRE Institutes and other institutions funded by ICFRE.	
	Average Index Score : 502	
Name of the P.I.: Dr. Lokho Puni Head	Budget : Rs. 9.93 lakh	
Name of Division: Non-wood Forest Product	Duration : 3 years (April 2010 - March 2013)	
 Long term objectives of the project: Data compilation of Non Wood Forest Products by ICFRE Institutes and Institutions funded by ICFRE. Short term objectives of the project: Data compilation of important Medicinal and Aromatic Plants Researches undertaken by ICFRE Institutes and other Institutions funded by ICFRE 		
Comments of Referees		
1. Prof. A.R. Nautiyal, Director, High Altitude Plant Physiology Research Center, H N B Garhwal University, Srinagar, Garhwal Comments not received.		
2. Comments not received.		
Comments of RAG : -Recommended with the following suggestions:-		
-Consult publication of ICMR, Forest Departments of the states, previous publications of FRI.		

Project title: Pre RAG - Phytochemical Studies on medicinally important aleurites moleuccana (Kukui) seeds. Revised project title - Phytochemical Studies on medicinally important *Diploknema butyracea* (Indian butter tree) seeds. (Modified as per recommendation of RAG).

Average Index Score : 500

Name of the P.I.: Dr. Rashmi Scientist-B	Budget : Rs. 6.12 lakh
Name of Division: Chemistry	Duration : 3 years 2010-2013

Long term objectives of the project

• The outcome of the project is the generation of new data which may lead to discovery of new bioactive compounds.

Short term objectives of the project

• Phytochemical examination of the proposed plant with respect to seeds and seed skin and characterize plant secondary compounds which may have biological activity.

Comments of Referees

Professor M.M.S. Rawat, Head, Department of Chemistry, University of Garhwal, Shrinagar Garhwal.

Technically the project is good. It is also well written and almost all references pertaining to the work on the proposed plant are mentioned. Recently Liu et al. (2008) isolated some novel diterpenes but still there is need of systematic phytochemical analysis of seeds and evaluation of their biological activities. The investigator should include evaluation of biological activities in the project.

The proposed project is viable. Work has not been done on the seeds of this plant. If the investigator works properly, some new compounds may emerged on isolation which may show biological activities too. I recommend the project for funding.

Professor D.H. Sharma, Centre of Energy Sudies, IIT Delhi, Hauzkhas, New Delhi – Comments not received.

Comments of RAG : - Recommended with the following suggestion:-

-Change the species either D.butrecea or wild apricot.

-Verify the literature in respect of these spp.

-Modify the project accordingly.

Project title : Pre RAG – Role of allelopathy on regeneration in silver fir (*Abies pindrow*) and spruce (*Picea smithiana*) forests - Effect of natural leachates on growth of young seedling in nursery.

Allelopathic Influences in regeneration of silver fir (*Abies pindrow*) and spruce (*Picea smithiana*) forests - Effect of natural leachates on seedling growth in nursery. (Modified as per recommendation of RAG).

Average Index Score : 496

Name of the P.I.: Dr. Ombir Singh, Scientist 'C'	Budget : Rs. 8.15 lakh
Name of Division: Silviculture	Duration : 4 Years (2010 – 2014)

Long term objectives of the project

• Solutions for natural regeneration.

Short term objectives of the project

- To investigate the effect of natural leachates of Litter, Humus, *Sarcocooca saligna*, *Viburnum nervosum* and Ferns on nursery growth of fir and spruce.
- Identification of allelo-chemicals in Litter, Humus, Sarcocooca saligna, Viburnum nervosum and Ferns and forest soil.

Comments of Referees

Dr. N.S. Bisht, IFS, Lane No. 1, Kothi No 11, Near Police Station,

Vasant Vihar Enclave, Vasant Vihar, Dehradun. - In 'Introduction' and 'Review', Uttarakhand should be mentioned in place of U.P.

- It is good to continue work on the previous projects but how long?

- In the technical programme, works proposed in the first year are similar to the results of the ongoing project on spruce and fir. Therefore, the project works should be started from the works as proposed for the second year of the technical programme.

- It would be better if the experiments are conducted in the natural environment of these species i.e. at Chakrata.

Shri G.P. Maithani, Rtd. Director, FRI, Vill. & Post Office Badripur, Opp. Asha Nursing Home, Dehradun :- Comments not received

Comments of RAG : - Recommended with the following suggestions:-

-Modify the title to suit the objectives.

-Include soil chemistry.

-Modify technical programme to avoid overlap with the previous project.

-Reduce the budget.

Project title : Pre RAG - Phyto-remediation of water logged waste land / low lying areas through biodrainage and soil amendments. Revised project title - Phyto-remediation of water logged waste land through biodrainage and soil amendments. (Modified as per recommendation of RAG).

Average Index Score : 494

Name of the P.I.: Mrs Kumud Dubey	Budget : Rs. 9.90 lakh
Name of Division: CSFER Allahabad	Duration : 5 Years

Long term objectives of the project

- To select promising Biodrainage species to reclaim the waterlogged site in Eastern Uttar Pradesh.
- To reclaim the waterlogged area through the plantation of Bio drainage species with soil amendments.

Short term objectives of the project

- To study the performance of selected fast growing tree species in water logged conditions.
- To study the effect of soil amendments as ameliorant of soil of waterlogged site.
- To study the effect of selected tree species on water table and soil quality.
- To select promising species for Biodrainage
- Extension of the technology developed to stakeholder.

Comments of Referees

Dr. Majid A Khan, Professor and Head, Deptt. of Entomology G. B. Pant University of Agriculture & Technology Pantnagar – 263145 (UK) Comments not received.

Dr. L.S. Prasad, Professor & Head, Department of Entomology, Sardar Ballabh Bhai Patel University of Agricultural Sciences & Technology, Modipuram, Meerut, U.P. - Comments not received.

Comments of RAG : -Recommended with the following suggestions:-

-Carryout work in the sites in Jaunpur/Ghazipur/Gorakhpur Districts.

- Reduce budget below 10 Lakh.

-Reduce manpower

-Head CSFER to ensure that there should not be any duplicacy with the similar work being done by TFRI Jabalur.

Project title: Pre RAG - Phytochemical examination of *Grevillea robusta*. Revised project title - Phytochemical examination of Acacia *albida* (Modified as per recommendation of RAG).

Average Index Score : 474

Name of the P.I.: Dr. Pradeep Sharma Research Officer	Budget : Rs. 8.27 lakh
Name of Division: Chemistry	Duration : 3 years 2010-2013

Long term objectives of the project

• Isolation of bioactive compounds.

Short term objectives of the project

- Isolation and structure elucidation of chemical compounds present in the leaves and bark of Acacia albida
- Studies on the antifungal activity of extractives/pure compounds on the Cylendrocladium quinqueseptatum, Aspergillus niger, Rhizoctonia solanii, Alternaria alternata, and Fusarium solanii.

Comments of Referees

Professor D.H. Sharma, Centre of Energy Studies, IIT Delhi, Hauzkhas, New Delhi - Comments not received

Professor M.S.S. Rawat, Head, Department of Chemistry, University of Garhwal, Srinagar Garhwal.

The investigator has indicated the references in the text but not listed them with the project. Already much phyto chemical work has been done on the leaves and

bark of this species. Alkyl resinols, rutine, phenolic constituents and resorcinols etc have been isolated. Therefore, I don't find any scope of work on the

proposed topic and that too in the absence of proper HPLC/ Flash Chromatograph for isolation of trace compounds from this species. However, the investigator can work on the comparative study of the phytochemicals from different populations of this plant.

Comments of RAG : -Recommended with following suggestions:-

-Change the species in consultation with CCF/CF Research Haryana.

-Revise the project accordingly.

Project No. 64		
Project title : Pre RAG – Development of marketing strategy for economically important medicinal plants of Eastern Uttar Pradesh.		
Provided project title. To study the marketing mechanism of commercially important medicinal plants in selected districts of Fastern U.D. (Medified as		
Kevised project title - 10 study the marketing mechanism of commerciany important medicinal plants in selected districts of Eastern U.F. (Modified as		
per recommendation of RAG).		
	Average Index Score : 451	
Name of the DI. Shri Hari Om Savana	Budget + Do 7 120 loth	
Name of the P.I.: Shift Half Oni Saxena,	Budget : RS. 7.150 Iakii	
Name of Division. CSEER Allahabad	Duration • 3 Vears	
Tame of Division. Col Lix Ananabad.	Duration. 5 reals	

Long term objectives of the project

• To study the marketing mechanism of commercially important medicinal plants in selected districts of Eastern U.P.

Short term objectives of the project

• To study the existing / traditional markets of commercially important medicinal plants in selected districts of Eastern UP. To study the various stakeholders involved in cultivation and trade of selected medicinal plants for establishing the market linkages. Capacity development of stakeholders involved in production and trade of medicinal plants.

Comments of Referees – Not given

Comments of RAG : - Recommended with the following suggestions:-

-Consult UPFDC to identify spp.

- Consult statistician to develop methodology.

-Update statistics about profit from cultivation of medicinal plants.

Project No. 65

Project title : Soil organic carbon store under different land uses in Haryana		
		Average Index Score :
Name of the P.I.: Dr. M.K. Gupta Scientist D	Budget : Rs. 8.43 lakh	
Name of Division: Forest Soil & Land Reclamation	Duration : 4 Years	
Long term objectives of the project		
• Improvement of environmental quality		
Short term objectives of the project		
• To assess the organic carbon store in the soils under different land uses.		
• To compare the soil organic carbon store of different land uses.		
• To work out soil organic carbon mitigation potential in different land uses		
Comments of Referees – Not given.		
Comments of RAG: - The project was formulated after the suggestion and recommendation of RAG.		