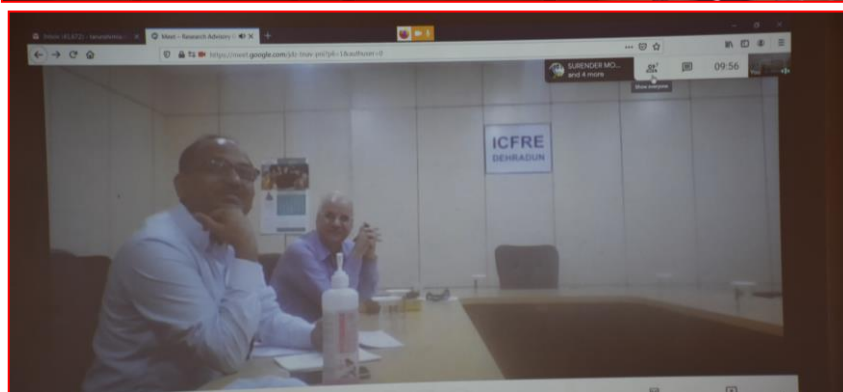


PROCEEDINGS OF XXIst RESEARCH ADVISORY GROUP (RAG) MEETING [21st September, 2020]



हिमालयन वन अनुसंधान संस्थान
HIMALAYAN FOREST RESEARCH INSTITUTE

(भारतीय वानिकी अनुसंधान एवं शिक्षा परिषद)
(Indian Council of Forestry Research & Education)

(पर्यावरण एवं वन मंत्रालय, भारत सरकार की एक स्वायत्त परिषद)

(An Autonomous body under the Ministry of Environment, Forests & Climate Change, Government of India)

कॉनिफर कैम्पस, पंथाघाटी, शिमला-171013 (हिमाचल प्रदेश)

Conifer Campus, Panthaghati, SHIMLA-171 013 (Himachal Pradesh)

BACKGROUND

Management of natural resources aims at arresting the decline of forest degradation vis-à-vis improving the ecosystem services. The integration of 17 Sustainable Development Goals (SDGs) recognizes that action in one area affects the outcomes in other and the development must balance social, economic and environmental sustainability. Involvement of different stakeholders for management of natural resources and institutional support to integrate scientific endeavours becomes mandatory. *Indian Council of Forestry Research & Education* (ICFRE) has formulated **National Forestry Research Plan (NFRP) 2020-30** with structural changes in its **Research Advisory Group (RAG)** and **Research Policy Committee (RPC)** at **Institute** and **Council** level with focus on innovativeness and objectivity in its research proposals linked with quantifiable output and outreach programmes.

Himalayan Forest Research Institute (HFRI), Shimla is also making all out efforts in conceptualizing demand driven proposals duly vetted by the members of its Research Advisory Group (RAG), involving different stakeholders for strengthening *forestry research* within the mandated thrust areas and themes. The two stage deliberation of the experts (Institute and Council) on the research proposals is expected to help the Forest Departments of the State and Union territories in sustainable management of their natural resources.

ROLE OF RESEARCH ADVISORY GROUP (RAG)

The RAG is an institute based research Project Evaluation Committee to evaluate the research projects for their fitness to carry out high quality research within the overall mandate of the institute and ICFRE. RAG is mandated to give direction and bring innovations in the proposed research proposals by the institute. Its role is critically important, particularly to consider and advise on regional research requirements of the mandated State and Union Territories of the institute, review the progress of ongoing projects, evaluate, prioritize and recommend new research proposal to **Research Policy Committee (RPC)**.

FUNCTIONS OF RESEARCH ADVISORY GROUP (RAG)

The main functions of **RAG** are to:

- provide direction in *forestry research* of the Institute within overall framework of research priorities set by *ICFRE*
- technically evaluate project proposals for their high quality within the overall mandate of the institute and recommend only those projects for Research Policy Committee of *ICFRE* which are found suitable to be funded from ICFRE plan funds

- critically examine the monitoring parameters and deliverables that can be achieved during and at the end of the project to ensure effective monitoring and evaluation
- recommend the proposed standalone projects to be included in the AICRPs
- propose the projects to be taken up under funding from other sources
- approve modifications proposed by the institute in the ongoing projects
- carry out any other function related with forestry research assigned by the institute from time to time

COMPOSITION OF RESEARCH ADVISORY GROUP (RAG)

On the recommendations of Director, Himalayan Forest Research Institute, Shimla, the following **Research Advisory Group (RAG)** for the Institute involving different stakeholders has been approved by the Director General, *ICFRE*.

LIST OF MEMBERS OF RESEARCH ADVISORY GROUP (RAG)

S. No.	Name	Designation	Address
A.	Chairman-Director of the Institute:		
1.	Dr. S.S. Samant	Director	Himalayan Forest Research Institute Conifer Campus, Panthaghathi, Shimla – 171 013 Phone: 0177-2626778 (O) 9816316318 (M) Email: dir_hfri@icfre.org
B.	Head of the Research Wing of the Forest Departments of Concerned States/Union Territories or their Representatives:		
B-1.	Himachal Pradesh:		
1.	Sh. Hari Singh Dogra, IFS	PCCF (Research)	Himachal Pradesh Forest Department, Karnodi, Sunder Nagar, District Mandi (H.P.) Phone: 01907-264113 (O) 98057-84195 (M) Email: dograhs@gmail.com
B-2.	Jammu & Kashmir UT:		
1.	Sh. Jitender Singh, IFS	CCF (Research)	Nominee, Director, State Forest Research Institute, SFRI Complex, Sonwar, Near Woodland School, Srinagar (J & K) Phone: 0194-2465213, 2468820(O) 99069-09051 Email: directorsfri123@gmail.com
B-3	Leh- Ladakh UT:		
1	Sh. Preetpal Singh, IFS	CCF	Leh Autonomous Hill Development Council, Leh- Ladakh (U.T) Email: ccfladakh@gmail.com
C.	ADG (Research Planning)/ DG ICFRE's Representative:		
1.	Dr. Vimal Kothiyal	ADG (RP)	ADG (RP) & Scientist-G ICFRE, Dehradun Phone: 0135-2753290 (O) 094129-88641(M) Email: adg_rp@icfre.org

D.	02 Senior Scientists of the Institute:		
1.	Sh. Jagdish Singh	Scientist-F & Head	Extension Division HFRI , Conifer Campus, Panthaghati, Shimla – 171 013 Phone: 0177-2816106 (O) 94180-71421 (M) Email: jaggy1964@gmail.com
2.	Dr. Ashwani Tapwal	Scientist-E & Head	Forest Protection Division HFRI, Conifer Campus, Panthaghati, Shimla – 171 013 Phone: 0177-2816114 (O) 94180-65960 (M) Email: ashwanitapwal@gmail.com
E.	01 Senior Forest Officer of the Institute:		
1.	Sh. Sanjeev Thakur, HPFS	DCF & Head	Facilities and Services Division HFRI, Conifer Campus, Panthaghati, Shimla – 171 013 Phone: 0177-2816112 (O) 94184-81674 (M) Email: sanjeev.hpsfc@gmail.com
F.	01 representative of the Universities Imparting Education in Forestry and Allied Subjects at the Level of Dean or Head of the Department:		
1.	Dr. Bhupinder Gupta	Dean	College of Forestry, University of Horticulture and Forestry, Nauni, Solan – 173 230 (HP) Phone: 70183 00578 (M) Email: bhupenderg@ymail.com
G.	01 Representative from a Funding Organization:		
1.	Dr. J.L.N. Sastry	Chief Executive Officer	Chief Executive Officer, National Medicinal Plants Board, Ministry of AYUSH, Govt. of India, Room No. 309, 3rd Floor, B-Block, AYUSH Bhawan, GPO Complex, INA, New Delhi -110023 Phone: 011- 24651828; 24651827(O) Email: infor-nmpb@nic.in
H.	02 Representatives of Forest Based Industries:		
1.	Sh. Surinder Mohan Gupta	Proprietor	Natural Biotech Products V. P. O. Baggi, Government High School, Mandi-175027 (HP) Phone: 094181-00334, 70185-61716 (M) Email: sur000ender@gmail.com
2.	Sh. Rajesh Kumar Guleria,	Proprietor	M/s R.K. Aromatic Village Arphi, P.O. Bhangrotu, Tehsil Balh, Distt. Mandi-175021 (HP) Phone: 94180-76064 (M) 70189-16016 (Phone) Email: rkaromatics64@gmail.com

I.	01 Eminent Forester Outside ICFRE:		
1.	Sh. Sushil Kapta, IFS	Director	Census Operation and Citizen Himachal Pradesh, SHIMLA, Phone: 94180-77725 (M) Email: skapta99@gmail.com
J.	01 Eminent Scientist Outside ICFRE:		
1.	Prof. (Retd.) T.N. Lakhanpal	Professor Emeritus	Sai Sadan Panthaghati, SHIMLA-171 009 Phone: 98162-64141 (M) 0177-2621229 @ Email: tejnath@yahoo.com
K.	01 Representative of ICAR/CSIR/NMPB:		
1.	Dr. Sanjay Uniyal	Senior Principal Scientist and Head	Division of Environment Technology, Institute of Himalayan Bio-resource Technology (IHBT) P. Box No. 06, Palampur -176061 Distt. Kangra (HP) Phone: 91-1894-233339 Email: suniyal@ihbt.res.in
L.	01 Representative of Sister Research Organizations:		
1.	Dr. K.S. Kanwal,	Scientist-D	Scientist In-charge, GB Pant National Institute of Himalayan Environment, Himachal Regional Centre, Mohal Kullu, Distt. Kullu (HP)-175126 Phone: 01902-225329 (O), 96502-00833 (M) Email: kskanwal03@gmail.com
M.	01 Representative of Progressive Farmer/Prominent NGO/JFM/Local Government/Grass Root Level Organization:		
1.	Sh. Pankaj Dogra	Progressive Farmer	S/o Rajinder Singh Dogra 88/1 Daholi, Post Office Maraog, Tehsil Chopal, Distt. Shimla -171211 (HP) Phone: 98054-67423 (M) Email: dograpankaj1881@gmail.com
N.	06 Subject Matter Experts from Outside ICFRE Institutes Covering the Subject Areas of the Institutes:		
1.	Dr. Mohar Singh Thakur	Principal Scientist & Scientist In-charge	National Bureau of Plant Genetic Resources, Phagli, Shimla – 171 005 (HP) Phone: 88940-09386 (M) Email: mohar.singh2@icar.gov.in
2.	Prof. (Retd.) M.K. Seth	Professor from HPU, Shimla	Amit Lodge, Near Comely Bank SHIMLA-171 003 (H.P.), Himachal Pradesh Phone: 94183-11557(M) Email: emkayseth@rediffmail.com
3.	Prof. Arvind Kumar Bhatt	Dean	Planning & Teachers' Matter Himachal Pradesh University Summer Hill, SHIMLA-171005 Phone: 94184-50009 (M) 0177-2833507, 2830499 (O) Email: bhtarvind@yahoo.com

4.	Prof. (Retired) S.P. Bhardwaj	Professor	Dr. S.P. Bhardwaj (Retd. Prof.) House 8, IAS Colony, Panthaghati, Shimla – 171 013 Phone: 94180-64600 (M) Email: bhardwajspdr@gmail.com
5.	Prof. Sanjeev Thakur	Professor and Head	Department of Tree Improvement and Genetic Resource, College of Forestry, University of Horticulture and Forestry, Nauni, SOLAN-173230 (HP) Phone: 94181-50975 (M) Email: sanjeevtigr@yaspuniversity.ac.in
6.	Dr. Lal Singh	Director	Himalayan Research Group (HRG) Umesh Bhawan, Chhota Shimla (HP) Phone: 98160-26820 2626802 (O) Email: lalhrg@gmail.com
0.	Member Secretary:		
1.	Dr. Rajesh Sharma	Scientist-G	Group Coordinator Research, Himalayan Forest Research Institute (HFRI), Conifer Campus, Panthaghati, Shimla – 171 013 Phone: 0177-2626801 (O) 94181-64067 (M) Email: groupco_hfri@icfre.org sharmar@icfre.org

The following Hon'ble member of Research Advisory Group (RAG) was unable to attend the meeting due to unavoidable circumstances:

- Sh. Sanjeev Thakur, HPFS,**
DCF & Head,
Facilities and Services Division,
HFRI, Conifer Campus, Panthaghati, Shimla – 171 013

PROGRAMME OF THE RAG MEETING

Date: 21st September, 2020

Venue: Conference Hall, Himalayan Forest Research Institute

Conifer Campus, Panthaghati, SHIMLA-171 013 (H.P.)

09.00 AM – 09.30AM	Reception & Registration of the RAG Members
INAUGURAL SESSION	
09.30 AM - 10.00 AM	Welcome Address: Dr. Rajesh Sharma, GCR, HFRI, Shimla
	Opening Remarks and Brief Presentation on HFRI Achievements and Outlay of the Meeting: Dr. S.S. Samant Director, HFRI, Shimla
INAUGURAL TEA : 10.00 AM to 10.20 AM	
SESSION I	
10.20 AM – 12.00 NOON	<p>Presentation of the New Research Proposals proposed to be initiated from April, 2021 onwards by the Scientists of various research divisions of the institute, subject to their final approval by Research Policy Committee (RPC):</p> <ul style="list-style-type: none"> Promotion of cultivation of <i>Picrorhiza kurroa</i>, <i>Podophyllum hexandrum</i> and <i>Valeriana jatamansi</i> through Community User Groups (CUGs) in Himachal Pradesh Sh. Jagdish Singh, Scientist-F Study on impact of mycorrhizal inoculations on the growth and field performance of <i>Abies pindrow</i> and <i>Picea smithiana</i> Dr. Ashwani Tapwal, Scientist-E Assessment of Floristic Diversity of Giri Khad Watershed, Himachal Pradesh for developing conservation strategies Dr. Ranjeet Kumar, Scientist-E Digitization of Herbarium, Fungarium and Insects Collection specimens of Himalayan Forest Research Institute Shimla Sh. Neelesh Yadav, Scientist-E
SESSION II	
12.00 NOON – 01.15PM	<p>Presentation of Research Activities/Highlights and Review of the Ongoing Research Projects being implemented by various research divisions and their extension/changes, if any:</p> <ul style="list-style-type: none"> Division of Forest Ecology & Climate Change: (01- Change Request) Division of Forest Protection: (02+01 Change Request) Division of Genetics & Tree Improvement: (01) Division of Silviculture and Forest Management: (04)
01.15 PM - 01.25 PM	Concluding remarks by RAG Members and Chairman
01.25PM – 01.30 PM	Vote of Thanks: Dr. Rajesh Sharma, GCR, HFRI, Shimla
LUNCH : 01.30 PM	

INAUGURAL SESSION

Himalayan Forest Research Institute (HFRI), Shimla organized **XXI Research Advisory Group (RAG) Meeting** on **21st September 2020** in the Conference Hall of the Institute. The meeting held **online** due to prevailing **COVID-19** pandemic conditions in which of the total twenty four members, twelve members joined the meeting online through Google Meet and of the remaining twelve, eleven members were present in the Conference Hall of the institute. Initiating the proceeding of the Meeting, **Dr. Rajesh Sharma, Scientist-G, Group Coordinator Research and Member Secretary, RAG** formally welcomed the Chairman, Hon'ble Members of **RAG**, representative of Director General, ICFRE, Dehradun, Dr. Vimal Kothiyal, Assistant Director General (Research Planning), ICFRE, Dehradun, along with Dr. Shailendra Kumar from RP Division, ICFRE, Dehradun and Scientists and Officers of HFRI. The Member Secretary apprised the house that the **XXI Research Advisory Group (RAG)** of the institute has been constituted by Director, HFRI, Shimla as per the guidelines of **National Forestry Research Plan 2020-2030** and approved by Director General, ICFRE. The RAG which includes renowned Scientists, Academicians, Forest Officers, Representatives of Forest Based Industries, Non-Governmental Organization and Progressive Farmers, examines, prioritizes and recommends the new research proposals prepared by the Scientists, for their final approval by the **Research Policy Committee (RPC)** and reviews the progress of ongoing projects.



After this, the GCR apprised the Hon'ble Members about the Institute and its recent salient research achievements and ongoing research and outreach activities which involved Trainings, Exposure Visits, Kisan Melas, Workshops, Seminars, PRAKRITI Programme etc. He also informed about the Institute's involvement in **“Preparation of Detailed Project Report for rejuvenation of five major rivers (Beas, Chenab, Jhelum, Ravi & Sutlej) of Indus Rivers Basin through forestry interventions”, Preparation of People's Biodiversity Register (PBR) of Shimla and Solan districts, implementation of 31 All India Coordinated Research Projects (AICRPs) under the scheme on “Strengthening Forestry Research for Ecological Sustainability Productivity Enhancement” by ICFRE institutes, of which HFRI**



scientist are involved in 15 AICRPs as PI and Co-PI and **Consultancy on Evaluation of Plantations** done by HP State Forest Department during 2016-17 and 2018-19 under CAMPA.

Dr. Vimal Kothial, ADG (Research Planning), ICFRE, as a representative of ICFRE, Headquarters, also welcomed all the Hon'ble Members of RAG, Scientists and Officers of HFRI on his own and on behalf of ICFRE. He requested all the Hon'ble Members to critically review the research projects in view of the changed evaluation criteria which has been linked with objectivity and output and give their scores on merit. He further urged the Hon'ble Members to give their considered opinion and valuable suggestions for improvement of the projects so that quality research projects are recommended for consideration before **RPC** of ICFRE for final approval.



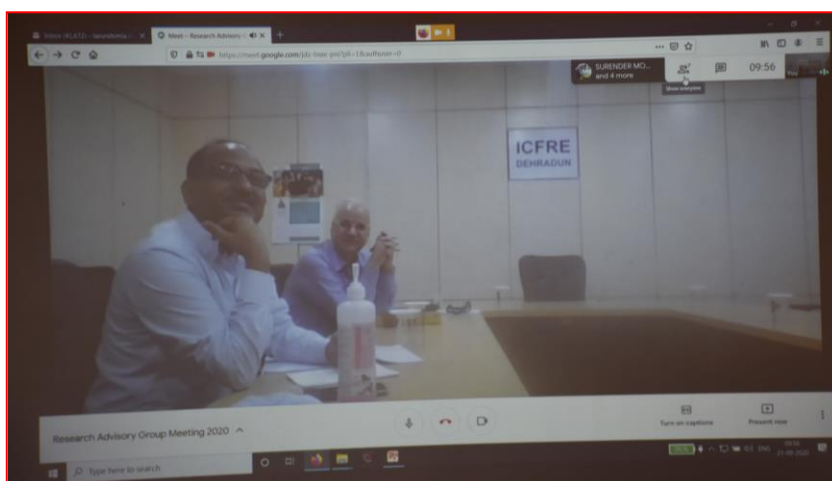
Dr. Rajesh Sharma invited Dr. S.S. Samant, Director, HFRI and Chairman of RAG for his welcome address and to share his views with the Hon'ble Members and participants.

Dr. S.S. Samant, Director, HFRI, Shimla extended a warm welcome to all the RAG Members present in the Conference Hall and those present online. After informing the RAG members about research endeavours of the institute, Dr. Samant made a sincere appeal to all the RAG Members to critically examine and evaluate the projects on their merit of innovativeness, objectivity and output and recommend research proposal for their presentation before the Research Policy Committee (RPC) of ICFRE for its final approval.



SOME GLIMPSES OF THE RAG MEETING





AGENDA ITEM NO. -I

Presentations of the New Research Proposals, proposed to be initiated from APRIL, 2021 onwards by various Research Divisions subject to approval by the Research Policy Committee (RPC):

Starting with the Agenda Item No. I, **Group Coordinator Research** briefed about the new research proposals to be presented before RAG for seeking necessary comments/ recommendations for further submission to the **Directorate of Research (ADG-RP)** at **ICFRE**, Dehradun. He further informed the Hon'ble

Members that this year the research divisions of this Institute are presenting **04 New Research Proposals**, within the thrust areas and themes of the council and in accordance with the guidelines of ICFRE, Dehradun.

The Member Secretary further informed the Hon'ble Members that the Scientists, those who will present their research proposals will be invited as per the details below:

S. No.	Title of the New Project	Name of PIs	Thrust Area and Theme	Duration	Budget (Rs. in Lakhs)
1	2	3	4	5	6
1.	Promotion of cultivation of <i>Picrorhiza kurroa</i> , <i>Podophyllum hexandrum</i> and <i>Valeriana jatamansi</i> through Community User Groups (CUGs) in Himachal Pradesh	Sh. Jagdish Singh, Scientist-F	Managing forests and forests products for livelihood support and economic growth <i>NTFP Resource Management</i>	5 Years (April, 2021-March 2026)	50.97
2.	Study on impact of mycorrhizal inoculations on the growth and field performance <i>Abies pindrow</i> and <i>Picea smithiana</i>	Dr. Ashwani Tapwal, Scientist-E	Managing forests and forests products for livelihood support and economic growth <i>Application of microbes in forestry</i>	5 Years (April, 2021-March 2026)	29.93
3.	Assessment of Floristic Diversity of Giri Khad Watershed, Himachal Pradesh for Developing Conservation Strategies	Dr. Ranjeet Kumar, Scientist-E	Biodiversity conservation and ecological security <i>Biodiversity conservation</i>	3 Years (April, 2021-March 2024)	32.66
4.	Digitization of Herbarium, Fungarium and Insects Collection specimens of Himalayan Forest Research Institute Shimla	Sh. Neelesh Yadav, Scientist-E	Biodiversity conservation and ecological security <i>Bioinformatics and Geo-informatics</i>	3 Years (April, 2021-March 2024)	15.19

After presentation of each of the research proposals, discussions were held and the suggestions/ comments given by the Hon'ble Members have been provided at the relevant places of the documents (Form-5: Tables: 5-8).





AGENDA ITEM NO.: II

Presentation of Research Activities/ Highlights and Review of the Ongoing Research Projects being implemented by various Research Divisions and their extension/changes, if any:

After the presentations on New Project Proposals (**Agenda Item No. I**), the **Member Secretary** informed the RAG members about the two ongoing research projects seeking extension of the project period. The projects are:

- Carbon sequestration potential of existing land use system in Lahaul Valley, Himachal Pradesh, **PI : Dr. R.K. Verma, Scientist-G**
- Studies on changing forest insect pest status of high altitudinal transitional zones and their management in Himachal Pradesh, **PI: Sh. Subhash Chander, Scientist-D**



Both the PIs after detailing the progress of the projects highlighted the reasons for extension of the project period to accomplish the envisaged activities. ADG (RP), ICFRE, Dehradun suggested to present these projects before RPC for extension of the project within the sanctioned outlay of the project.

This was followed by the detailed presentation of the ongoing research projects being implemented by the institute under PLAN by the individual PIs as per the details below;

1]. RESEARCH PROJECTS UNDER PLAN BUDGET:

A]. DIVISION OF FOREST PROTECTION:

1.	Studies on effect of AM inoculations on the active ingredient contents and biomass production in <i>Angelica glauca</i> Edgew. and <i>Valeriana jatamansi</i> Jones Dr. Ashwani Tapwal, Scientist-E
2.	Insect pests of Western Himalayan Oaks and their Control Sh. Subhash Chander, Scientist-D

B]. DIVISION OF GENETICS & TREE IMPROVEMENT:

1.	Identification, Ecological Assessments for Selection & Screening of Superior and Insect-Pest Resistant Clones of <i>Salix</i> for their Cultivation, Production Trends and Conservation in the Cold Deserts of Himachal Pradesh and Jammu & Kashmir. Dr. Rajesh Sharma, Scientist-G
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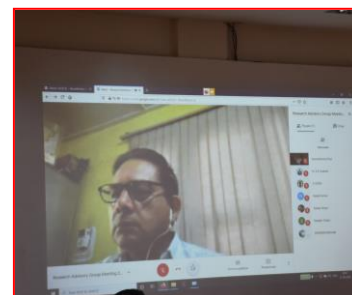
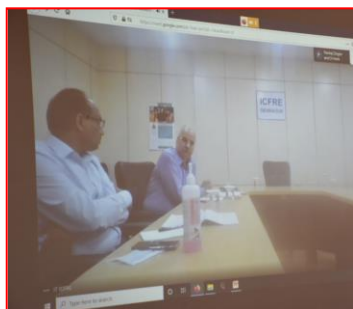
D]. DIVISION OF SILVICULTURE & FOREST MANAGEMENT:

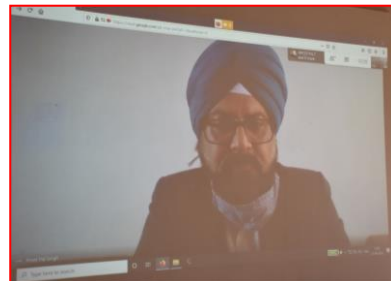
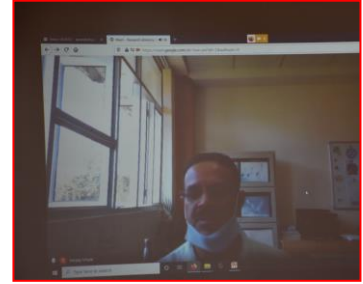
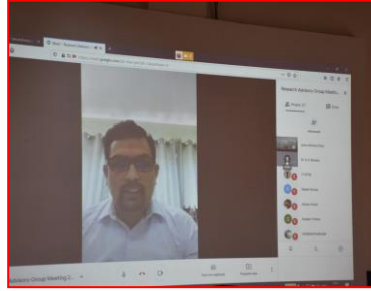
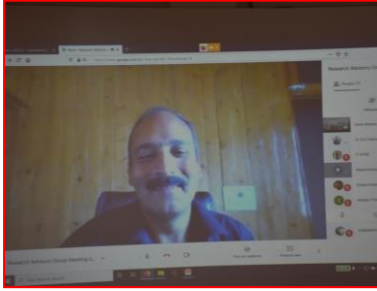
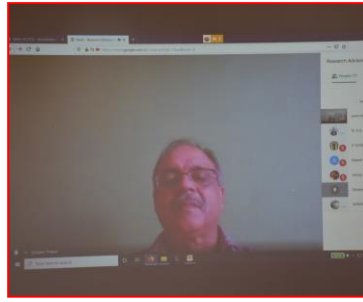
1.	Survey and evaluation of Silvipastoral systems in Himachal Pradesh and its role in sustaining community livelihood Dr. Swarn Lata, Scientist-C
2.	Standardization of Agro-Techniques and Evaluation of Growth Parameters of <i>Juniperus polycarpus</i> C. Koch under Nursery and Field Conditions. Sh. Pitamber Singh Negi, Scientist-C
3.	Population assessment, ecological niche modelling and developing sustainable harvesting technique of <i>Pinus gerardiana</i> for conservation in Himachal Pradesh and Jammu & Kashmir. Dr. Swarn Lata, Scientist-C
4.	Assessment, Ecological Niche Modelling and Strengthening of Agroforestry Systems for Securing the Livelihoods of Inhabitants in Cold Desert Region of Himachal Pradesh and Ladakh Sh. Pitamber Singh Negi, Scientist-C

All the Hon'ble Members of RAG expressed satisfaction on the progress made by all the PIs under their respective research projects during the year.

Other related and relevant details of the Ongoing research projects under PLAN funded have been provided in the following pages in **Annexure-2 (Information Required on ICFRE Plan Projects for RPC-2021) – Form-1-Tables:1-4, Forms-2, 3 and 4.**

Members of Research Advisory Group 2020-2021





**Information Required
on
ICFRE Plan Projects for
XXI RPC 2021-22**

Form-1
(Tables 1-4)

Thrust area wise list of ongoing Research Projects and detailed budget for 2021-22:

Ongoing Projects

Table 1: Thrust area I-Managing Forests and Forests Products for Livelihood Support & Economic Growth

Thrust area wise list of ONGOING RESEARCH PROJECTS												
Thrust area I: Managing Forests and Forests Products for livelihood support & economic growth												
S. No.	Project title/PI/Duration (Start and end year)	Total approved budget outlay (Rs. in lakhs)	Cumulative expenditure till March 2020	Approx. expenditure during 2020-21	Details of budget required for 2021-22 (Rs. in lakhs)						Required / engaged Manpower (RA/ SRF/ JRF/ PA/ FA etc.)	Remarks: [Extension granted; modification in a) objectives; b) budget outlay]
					Budget required for 2021-22 (Sum of 6 to 10)	Sub Head wise breakup for 2021-22						
						Consumables (M&S)	Research expenditure (FRE)	Travel And conveyance (Res)-TE	Capital (Scientific Equipments)	Fellowship		
1	2	3	4a	4b	5	6	7	8	9	10	11	12
I) Institute: Himalayan Forest Research Institute (HFRI), Shimla												
i.	Insect pests of Western Himalayan Oaks and their Control. [HFRI-068/Th.:01/IPDC(17)/(FPT-15)/ PLAN/ 2019-22] PI: Sh. Subhash Chander, Scientist-D Duration: 05 years (2019-2022) Theme: Integrated Pest and Disease Management	9.26	2.61	2.61	3.69	0.30	0.30	0.50	-	2.59	JPF- 01	--
ii.	Studies on effect of AM inoculations on the active ingredient contents and biomass production in Angelica glauca Edgew. and Valeriana jatamansi	26.33	4.79	5.21	6.64	0.10	1.50	0.50	-	4.54	SRF-01	--

	<p>Jones PI: Dr. Ashwani Tapwal, Scientist-E Duration: 05 years (2019-2024) Theme: <i>NTFP Resource Development (A)</i></p>											
iii.	<p>Population assessment, ecological niche modelling and developing sustainable harvesting technique of <i>Pinus gerardiana</i> for conservation in Himachal Pradesh and Jammu & Kashmir PI: Dr. Swaran Lata, Scientist-C Duration: 05 years Theme: <i>Social Forestry, Agroforestry/Farm Forestry</i></p>	50.96	-	4.38	10.08	0.90	2.00	2.00	-	5.18	JPF-02	
iv.	<p>Assessment, Ecological Niche Modelling and Strengthening of Agroforestry Systems for Securing the Livelihoods of Inhabitants in Cold Desert Region of Himachal Pradesh and Ladakh. PI: Sh. P.S. Negi, Scientist-C Duration: 05 years Theme: <i>Social Forestry, Agroforestry/Farm Forestry</i></p>	60.55	-	8.00	10.84	0.40	3.00	2.25	-	5.19	JPF-02	

Table 2: Thrust area II- Biodiversity conservation and ecological security

Thrust area wise list of ONGOING RESEARCH PROJECTS												
Thrust area II- Biodiversity conservation and ecological security												
S. No.	Project title/PI/Duration (Start and end year)	Total approved budget outlay (Rs. in lakhs)	Cumulative expenditure till March 2020	Approx. expenditure during 2020-21	Details of budget required for 2021-22 (Rs. in lakhs)					Required / engaged Manpower (RA/ SRF/ JRF/ PA/ FA etc.)	Remarks: [Extension granted; modification in a) objectives; b) budget outlay	
					Budget required for 2021-22 (Sum of 6 to 10)	Sub Head wise breakup for 2021-22						
						Consumables (M&S)	Research expenditure (FRE)	Travel And conveyance (Res)-TE	Capital (Scientific Equipments)			Fellowship
1	2	3	4a	4b	5	6	7	8	9	10	11	12
I) Institute: Himalayan Forest Research Institute (HFRI), Shimla												
v.	Identification, Ecological Assessments for Selection & Screening of Superior and Insect-Pest Resistant Clones of Salix for their Cultivation, Production Trends and Conservation in the Cold Deserts of Himachal Pradesh and Jammu & Kashmir [HFRI-066/Th.:02&04/BC(10): CFGR(02)/ (E&BC-21)/ PLAN/ 2017-24] Project Coordinator: Dr. Rajesh Sharma, Scientist-G & Head, GTI Division PIs: Dr. Rajesh Sharma, Scientist-G, Dr. Vaneet Jishtu, Scientist-D, Dr. Sandeep Sharma, Scientist-G, Dr. Ranjeet Kumar, Scientist-E,	54.88	16.64	11.43	15.73	1.80	2.30	2.20	--	9.43	JPF-01 PA-03	

Sh. Subhash Chander, Scientist-D												
Duration: 07 years (2017-2024)												
Theme: • Biodiversity Conservation • Conservation of Forest Genetic Resources												

Table 3: Thrust area III- Forest and Climate Change

Thrust area wise list of ONGOING RESEARCH PROJECTS												
Thrust area III- Forest and Climate Change												
S. No.	Project title/PI/Duration (Start and end year)	Total approved budget outlay (Rs. in lakhs)	Cumulative expenditure till March 2020	Approx. expenditure during 2020-21	Details of budget required for 2021-22 (Rs. in lakhs)						Required / engaged Manpower (RA/ SRF/ JRF/ PA/ FA etc.)	Remarks: [Extension granted; modification in a) objectives; b) budget outlay
					Budget required for 2021-22 (Sum of 6 to 10)	Sub Head wise breakup for 2021-22						
						Consumables (M&S)	Research expenditure (FRE)	Travel And conveyance (Res)-TE	Capital (Scientific Equipments)	Fellowship		
1	2	3	4a	4b	5	6	7	8	9	10	11	12
I) Institute: Himalayan Forest Research Institute (HFRI), Shimla												
NIL												

Table 4: Thrust area IV- Forest Genetic Resource Management and Tree Improvement

Thrust area wise list of ONGOING RESEARCH PROJECTS												
Thrust area IV- Forest Genetic Resource Management and Tree Improvement												
S. No.	Project title/PI/Duration (Start and end year)	Total approved budget outlay (Rs. in lakhs)	Cumulative expenditure till March 2020	Approx. expenditure during 2020-2021	Details of budget required for 2021-22 (Rs. in lakhs)						Required / engaged Manpower (RA/ SRF/ JRF/ PA/ FA etc.)	Remarks: [Extension granted; modification in a) objectives; b) budget outlay
					Budget required for 2021-22 (Sum of 6 to 10)	Sub Head wise breakup for 2021-22						
						Consumables (M&S)	Research expenditure (FRE)	Travel And conveyance (Res)-TE	Capital (Scientific Equipments)	Fellowship		
1	2	3	4a	4b	5	6	7	8	9	10	11	12
I) Institute: Himalayan Forest Research Institute (HFRI), Shimla												
	NIL											

Form-2

Thrust area wise Ongoing Projects with CHANGE REQUEST (Note: *Projects reflected here may not be added in ongoing projects list to avoid duplicity*)

S. No.	Title of the project/ PI/ Duration (Start and end year)	Change request with justification	RAG's comments	Total approved budget outlay (Rs. in lakhs)	Cumulative expenditure till March 2020	Approx. expenses during 2020-21	Balance available (Rs in lakhs)	Budget required for 2021-22 (Rs in lakhs)						Required / engaged Manpower (RA/SRF/ JRF/ PA/ FA etc.)	Remarks: [No of Extension granted; modification in a) objectives; b) budget outlay]
								Budget required for 2021-22 (Sum of 7 to 10)	Consumables (M&S)	Research Expenditure (FRE)	Travel And Conveyance (Res)-TE	Capital (Scientific Equipments)	Fellowship		
1	2	3	4	5	4a	4b	4c	6	7	8	9	10	11	12	13
	Thrust area I: Managing Forests and Forests Products for Livelihood Support & Economic Growth														
vi.	Studies on changing forest insect pest status of high altitudinal zones and their management in Himachal Pradesh PI: Sh. Subhash Chander, Scientist-D Duration: 04 years (2017-2021) Theme: <i>Integrated Pest and Disease</i>	On transfer of Dr. Ranjeet Singh, Scientist-G, the project is being executed by Sh. Subhash Chander, Scientist-D. The envisaged project activities involving collection of data of insect fauna from selected sites could not be undertaken this year due to COVID-19 pandemic. As a result, the data remains inconclusive. All the selected sites are above 3500m with limited working season. Of the 350 collected specimens only 100 have been identified and the	Recommen- ded for extension by RAG for approval of RPC	25.00	14.63	4.74	--	6.99	0.30	0.85	0.80	-	5.04	SPF-01 PA-01	

	Management	identification of the remaining will take more time. Also the development of Biological Control Strategies for major forest insect-pests in laboratory and field trials of the same is yet to be carried out. Keeping the above in view, extension of one year is required within the same budget outlay.													
	Thrust area II: Biodiversity Conservation and Ecological Security														
	NA														
	Thrust area III: Forest and Climate Change														
vii.	Carbon sequestration potential of existing land use system in Lahaul Valley, Himachal Pradesh. [HFRI-060/Th.-03/CCF- 03(E&BC-20)/PLAN 2016-21] PI: Dr. R.K. Verma, Scientist-G Duration: 05 years (2016-2021) Theme: Climate Change & Forests	1. Change in Title 2. One activity is required to be deleted 3. One year extension is required Justification is under please. Change in the Title of the Project: Present Project title: Carbon Sequestration Potential of Existing Land-use Systems in Lahaul Valley, Himachal Pradesh Suggested Project Title: Assessment of Carbon Stock in Existing Land Use Systems of Lahaul Valley, Himachal Pradesh 1. Activity to be deleted: Recommendations of site specific models under various land use systems. 2. One year Extension Required:	Recommend- ed for extension by RAG for approval of RPC	20.80	11.35	2.80	--	3.88	0.20	0.15	1.25	-	2.28	PA- 01	

		<p>There is a need for the extension of the project at least for one year for accomplishment of some activities.</p> <p>Justification for Extension of the Project:</p> <p>➤ Initially during the year 2017-2018, much work could not be done as per action plan of the project due to untimely snow fall and blockage of the Rohtang pass –the only approach road to Lahual valley and delay of the project activities also pointed out by ADG (M&E) during annual review of the project. In response to the comment of ADG (M&E), Principal Investigator at that time requested to give one year extension for the project to complete the left out activities.</p> <p>➤ Despite all efforts made by the Principal Investigator to complete the planned project activities, study with respect to some of the land use systems viz., mixed forest, salix and poplar plantations, alpine pastures, Bhojpatra forest, degraded land use system, Agri-Horticulture system in different catchments/valleys could not be completed.</p>														
	Thrust area IV: Forest Genetic Resource Management and Tree Improvement															
	NA															

Form-3

Thrust area wise summary of ongoing projects of ICFRE Institutes for 2021-22

Thrust Area Wise Abstract of Ongoing Research Project Proposals											
NAME OF THE INSTITUTE: Himalayan Forest Research Institute (HFRI), Shimla			Man Power Engaged								
THRUST AREA	No. of Projects	RA	SRF	JPF	JRF	PA	FA	TA	Con.	DEO	Total
Thrust Area I	04	--	01	05	--	--	--	--	--	--	06
Thrust Area II	01	--	--	01	-	03	--	--	--	--	04
Thrust Area III	-	--	--	--	--	-	--	--	--	--	-
Thrust Area IV	--	--	--	--	--	--	--	--	--	--	--
Total Projects	05	--	01	06	-	03	--	--	--	--	10
RA: Research Associate, SRF: Senior Research Fellow, JPF: Junior Project Fellow, JRF: Junior Research Fellow, PA: Project Assistant, FA: Field Assistant, TA: Technical Assistant, Con: Consultant DEO: Data Entry Operator											

Note: Give number only. Figures should match with Form 1 (Tables 1-4).

This table will not include ongoing projects submitted for change request (Form 4)

Form-4

Thrust area wise summary of ongoing projects submitted for CHANGE REQUEST 2021-22

Thrust area wise abstract of ongoing research projects for change request										
NAME OF THE INSTITUTE		Man Power Engaged								
THRUST AREA	No. of Projects	RA	SPF	JRF	PA	FA	TA	Con.	DEO	Total
Thrust Area I	01		01		01					02
Thrust Area II		NIL								
Thrust Area III	01				01					01
Thrust Area IV		NIL								
Total Projects	02		01		02					03
RA: Research Associate, SRF: Senior Research Fellow, SPF: Senior Project Fellow, JRF: Junior Research Fellow, JPF: Junior Project Fellow, PA: Project Assistant, FA: Field Assistant, TA: Technical Assistant, Con: Consultant DEO: Data Entry Operator										

Form-5 (Tables 5-8)

Thrust area wise NEW project proposals for 2021-22

I) Institute: HIMALAYAN FOREST RESEARCH INSTITUTE, SHIMLA

Table 5: Thrust area I- Managing Forest and Forests Products for Livelihood Support and Economic Growth

Project No. 1	
Project title: Promotion of cultivation of <i>Picrorhiza kurroa</i> Royle ex Benth, <i>Podophyllum hexandrum</i> Royle and <i>Valeriana jatamansi</i> Jones through Community User Groups (CUG,s) in Himachal Pradesh	
ICFRE Thrust Area: Managing Forest and Forests Products for Livelihood Support and Economic Growth	ICFRE Theme: <i>NTFP Resource Development</i>
Name & Designation of the PI / Co-PI: PI: Sh. Jagdish Singh, Scientist-F, Extension Division Co-PIs: Dr. Sandeep Sharma, Scientist-G, SFM Division Sh. P. S. Negi, Scientist-C, SFM Division Sh. Ashwani Kumar, CTO, Extension Division Name of Division: Extension Division Silviculture and Forest Management Division	Budget outlay of the Project (Rs in lakhs): Rs. 50.97 Lakhs Duration (start & end date): April, 2021 to March, 2026 No. of years: 05 Years Score on Technical criteria of Project Assessment (out of 100): 82.85
Name and cost of equipment proposed :	Camera (01), Digital Caliper (03) and Digital Weighing Machine (01) 2.00 Lakhs
Gap in knowledge identified:	Research and extension for promote of commercial cultivation of superior genetic stock of <i>P. kurroa</i> , <i>P. hexandrum</i> and <i>V. jatamansi</i> through Community User Groups (CUG,s) and linking with market is lacking, hence this proposal to address the gaps.
Long term objectives of the project: <ol style="list-style-type: none"> 1. Sustainable income generation through cultivation of medicinal plants 2. Protection and conservation of selected medicinal plants Short term objectives of the project: <ol style="list-style-type: none"> 1. To raise quality planting stock of <i>Picrorhiza kurroa</i> (1.5 lakhs) <i>Podophyllum hexandrum</i> (1.0 lakhs) & <i>Valeriana jatamansi</i> (2.5 lakhs) by using superior sources. 2. To evaluate the economics of cultivation of selected medicinal plants. 3. To evaluate the change in active ingredient contents of selected medicinal plant species under varied field conditions. 4. To develop marketing linkages for better return of the produce 5. To conduct capacity building programmes on nursery and cultivation techniques for promotion of cultivation of medicinal plants amongst CUGs. 	
Novelty of Project: Commercial cultivation of selected medicinal plants through CUG,s, working out its economics and transferring the research from lab to land and for ensuring sustainable	

income generation to farming community involves considerable innovation in the project. Further at the end of project period specific recommendation about most suitable sites for each selected spp. for taking up commercial cultivation will be made.

Relevance of the Project to the work already done:

The Himalayan Forest Research Institute, Shimla has been working on medicinal plants since last one and half decade. Recently the institute has embarked upon collection and maintenance of germplasm of medicinal plants of economic importance of temperate Himalayas and development/improvement of agro-techniques for their commercial cultivation. HFRI is now in a position to handle higher temperate medicinal plants project having expertise as well as field stations to cater to the specific requirements of those species. Under the proposed project we intend to strengthen those nurseries by establishing additional facilities viz. Poly House, Shade House and strengthening irrigation facilities and modern nursery tools and implements because raising quality planting stock, the above mentioned modern facilities in the nurseries are essentially required. It is essential, these days to establish such facilities in nursery not only for production of quality planting material for distribution but for demonstration of nursery-techniques to visiting farmers/ other stakeholders.

All these medicinal plant species have very good domestic as well as international market. Therefore, it is right time that QPM of these medicinal plants be multiplied and extended to the farming community of temperate Himalayas through active extension programmes viz. visits, training, demonstration, on-farm cultivation etc. to incorporate these activities in hill farming system.

Deliverables at the end of the project:

- Production of QPM of *P. kurroa* (1.5 lakhs), *P. hexandrum* (1.0 Lakhs) and *V. jatamansi* (2.5 Lakhs)
- By taking up commercial cultivation through CUG,s will definitely enhance the bargaining power of the farmers and will help them to get more economic returns
- Establishment of three Kissan Nurseries at the locations of different CUG,s with Poly house and Shade house facilities for production of QPM of medicinal plants
- Information regarding variation in a.i. content under varied cultivation conditions to further recommend the most suitable sites for taking up commercial cultivation of selected medicinal plants.
- An option for diversification and opportunity to augment their rural income.
- Mitigating pressure on the natural resources hence conservation of natural resources will take place
- Meeting the raw material demand of herbal-based industries on sustainable basis.
- Organization of 08 trainings on nursery and cultivation of medicinal plants for the benefit of different stakeholders.

Summary of Comments of RAG:

Sh. Jagdish Singh, Scientist F, Extension Division, made presentation on research project titled “**Promotion of cultivation of *Picrorhiza kurroa* Royle ex Benth, *Podphyllum hexandrum* Royle and *Valeriana jatamansi* Jones through Community User Groups (CUG,s) in Himachal Pradesh**” and threw light on problem statement, backward and forward linkages, review of literature, objectives, research methods, action plan, project cost, predicted outcome and extension plans of the project. The presenter highlighted the importance of Himalayan herbs and informed about their great demand by Ayurvedic and pharmaceutical industries that are facing shortage of raw material. The shortage of raw material not only has necessitated cultivation of these medicinal plants to meet the growing demand but also ensuring their conservation and stressed on diversification of present farming practices in the temperate region of the state for sustainable income generation. He informed about sporadic cultivation of these medicinal plants in the state of Himachal Pradesh and Union territory of Jammu & Kashmir and the government initiative of Van Samridhi and Jan Samridhi and establishment of Jari Buti Cell. The presenter stressed upon the need for the promotion of the temperate medicinal plants for their commercial cultivation through Community User Group (CUGs) so that the farmers may enhance their economic returns.

During discussion the following suggestions/comments were given :

- To make use of already standardized propagation technique of the species
- Market linkages issues need to be addressed and it was suggested to include the estimates of reduction of raw material
- Identification of correct species during field collection need to be ensured.
- The issue of linkages with the industry need to be addressed beforehand
- In view of the long rotation of the crop signing of MoU both with the farmers and industries was suggested
- The establishment of multi-location field trials raised with quality planting stock should ensure development of clones or varieties and field trials should

<p>be in conformity of ICFRE guidelines for field trials to end up with release of varieties/clones</p> <ul style="list-style-type: none"> • Review of literature needs to be updated • For field trials, if any, statistical design should be followed <p>Dr. S.S. Samant suggested the PI to include the suggestions given by RAG members for improvement of the proposal.</p>
<p>Whether the project has been modified as per RAG comments (if yes, give details)</p> <p>Yes. The above mentioned suggestions/comments of RAG members have been included in the proposal.</p>
<p>Benefits of the project for the society (Not more than 100 words): With propagation methods in vogue and superior genetic sources <i>P. kurroa</i>, <i>P. hexandrum</i> and <i>V. jatamansi</i> known, the quality planting stock of these selected medicinal plants can be made available to Community User Groups (CUGs) to take up commercial cultivation on their farms for better economic returns. This will ultimately save the wild resource of these species and also meet their ever growing industrial demand for raw material.</p>

Project No. 2.	
Project title: Study on impact of mycorrhizal inoculations on the growth and field performance <i>Abies pindrow</i> and <i>Picea smithiana</i>	
ICFRE Thrust Area:	ICFRE Theme:
Managing forests and forests products for livelihood support and economic growth	Application of microbes in forestry
<p>Name & Designation of the PI / Co-PI:</p> <p>PI : Dr. Ashwani Tapwal, Scientist- E, Forest Protection Division</p> <p>Co-PI: Sh. P. S. Negi, Scientist- C, SFM Division</p>	<p>Budget outlay of the Project (Rs in lakhs): Rs. 29.93 lakhs</p> <p>Duration (start & end date): April, 2021-March, 2026</p> <p>No. of years: 05 Years</p> <p>Score on Technical criteria of Project Assessment (out of 100): 86.15</p>
Name of Divisions:	Forest Protection Division Silviculture and Forest Management Division
Name and cost of equipment proposed :	NIL
Gap in knowledge identified:	Exclusive list of mycorrhizal fungi associated with fir and spruce trees of NW Himalaya is not available. Only some work has been done in the past on some selected tree species that too with the mycobiont isolated from roots to evaluate the impact of mycorrhizal inoculations on the growth and development under glasshouse conditions. But it is still lacking for the selected high altitude conifers. Most of the research work carried out was under laboratory and glasshouse conditions. It needs to be extended up to observe and evaluate field performance. In India, molecular characterization of ectomycorrhizae was not attempted in fir and spruce.
<p>Long term objectives of the project: NA</p> <p>Short term objectives of the project:</p> <ol style="list-style-type: none"> 1. To investigate the mycorrhizal relationship in the roots of <i>Abies pindrow</i> and <i>Picea smithiana</i>. 2. To estimate and assess the diversity of mycorrhiza forming fungal associates of <i>Abies pindrow</i> and <i>Picea smithiana</i>. 3. To evaluate the growth and development of artificially inoculated seedlings under nursery and field. 	
<p>Novelty of Project:</p> <p>This project aims testing the field performance of silver fir and spruce seedlings tailored with mycorrhizal fungi as the same has not attempted in the past. Further, the</p>	

mycorrhizal association in silver fir and spruce will be facilitated and authenticated by molecular techniques. The seedlings raised by artificial inoculation of mycorrhizal fungi will certainly accelerate quality growth parameters and outplanting performance and reduce the nursery period of the seedlings and ultimately the cost of raising the seedlings of these two high altitude conifers.

Relevance of the Project to the work already done:

The high altitude conifer *Pinus gerardiana* raised with inoculation of *Scleroderma polyrhizum* has resulted in increase of 44-94 % increase in different growth parameters of inoculated seedlings and the seedlings outplanted at the age of two years have shown better survival and establishment in the field compared to non- inoculated seedlings.

Deliverables at the end of the project:

- Inventory of ectomycorrhizal fungi associated with silver fir and spruce.
- *In vitro* germplasm conservation of culturable ECM fungi.
- Ectomycorrhizal associates of silver fir and spruce confirmed by molecular techniques.
- Efficacy of artificial inoculation on the growth and development of seedlings.
- Reduction in nursery period of Silver fir and spruce.

Summary of Comments of RAG:

Dr. Ashwani Tapwal, Scientist E, Forest Protection Division presented project proposal titled “**Study on impact of mycorrhizal inoculations on the growth and field performance *Abies pindrow* and *Picea smithiana***” and threw light on problem statement, backward and forward linkages, review of literature, objectives, methodology, action plan, project cost and predicted outcome. Dr. Tapwal highlighted the importance of mycorrhiza, known to improve the growth performance of the associated plants by manipulating the physiological processes such as increased absorption surface, selective ion absorption and accumulation, help the plants to survive in drought conditions and provides protection from soil borne disease. Since silver fir and spruce are slow growing species and known to have poor natural regeneration, the mycorrhizal application in the nursery can improve their growth and reduce the nursery period. HFRI has developed nursery and planting technique of these species in the past, but artificial inoculation with suitable mycorrhizal fungus was not attempted. Therefore, the project proposal aims to investigate the mycorrhizal diversity and impact of mycorrhizal inoculation on the growth and development of two important high altitude conifers

After the presentation, Director, HFRI invited RAG members for their valuable suggestions/comments for refinement of the proposal.

- **Markers to be used need to be specified**
- **The field testing of inoculated and non-inoculated seedlings requires more time, hence project should be of longer duration, suggested to take up follow up project**
- **The percentage increase in growth of mycorrhizal inoculated seedlings in *Pinus gerardiana* need to clearly mentioned.**
- **Review budget for manpower**
- **Review of literature need to be updated**
- **On issue of use of waste material (rice straw) or wheat for mass multiplication, use of Peat Moss was suggested or using already standardized technique/material for mass multiplication.**

Director, HFRI, Shimla asked the presenter to include all the suggestions given by RAG members before final submission of the proposal for RPC

Whether the project has been modified as per RAG comments (if yes, give details):

Yes, the above given suggestions/comments have been included by the Principal Investigator in the project document.

Benefits of the project for the society (Not more than 100 words):

Silver fir and spruce have poor natural regeneration due to varied reasons. They require long period in nursery before out-planting. Application of mycorrhizal fungi will improve the growth of seedling in nursery and better performance upon out-planting. It is expected that the nursery period will also get reduced. The outcome of the research project will definitely help the State Forest Department in overcoming the natural regeneration problem, gap filling of the forests besides reducing the nursery period and field performance of these high altitude conifer species.

Table 6: Thrust area II- Biodiversity conservation and ecological security

Project No. 1.	
Project title: Assessment of Floristic Diversity of Giri Khad Watershed, Himachal Pradesh for Developing Conservation Strategies	
ICFRE Thrust Area: Biodiversity Conservation and Ecological Security	ICFRE Theme: <i>Biodiversity conservation</i>
Name & Designation of the PI / Co-PI: PI: Dr. Ranjeet Kumar, Scientist-E Co-PI: Dr. R.K. Verma, Sci. G, FE&CC Division Name of Divisions: Forest Ecology and Climate Change Division	Budget outlay of the Project (Rs in lakhs): Rs. 32.661 lakhs Duration (start & end date): April, 2021-March, 2024 No. of years: 03 Years Score on Technical criteria of Project Assessment (out of 100): 84.00
Name and cost of equipment proposed	Nil
Gap in knowledge identified:	Although regular assessment and monitoring of vegetation types are done at national and international level but there is very less data base of vegetation found in the watershed. There is need of assessment of population of various species for watershed at regular intervals. There is very less information on plant diversity of the Giri Khad watershed. So plant diversity will be assessed in the watershed and prioritization of species and communities will be done.
Long term objectives of the project: <ol style="list-style-type: none"> 1. To monitor changes in vegetation pattern on time scale and climate change. 2. To conserve and optimize floristic diversity for ensuring soil and water conservation of the watershed. Short term objectives of the project: <ol style="list-style-type: none"> 1. To study the impact of climate change on floristic diversity, community composition, regeneration of forests, socioeconomic patterns and conservation strategies. 2. To prioritize potential habitats, species and communities. 3. To study physico-chemical properties of soil under different land uses. 4. To assess the changes in land use and land cover through Remote Sensing and GIS. 5. To prepare conservation strategy for the management of floral diversity. 	
Novelty of Project: The threatened plants of the watershed will be documented. Prioritization of the habitat, species and communities will be done. The database will be helpful in the management of natural resources in the watershed.	
Relevance of the Project to the work already done: Although the research work on plant diversity has been done in various ecosystems and landscapes but the data base on Upper Giri Khad watershed on plant diversity is not available.	
Deliverables at the end of the project: <ul style="list-style-type: none"> ➤ Database on species, habitat and community ➤ Database on floristic diversity and natural regeneration ➤ Database on distribution pattern and indigenous uses of the economic important plant 	

<ul style="list-style-type: none"> ➤ Database on the extraction trends of fuel and fodder ➤ The Database on native and endemic species ➤ The database on physico-chemical properties of the soil ➤ The database on threat category on habitat, species and community ➤ The map of land use and land cover ➤ An awareness program on biodiversity conservation will be organization ➤ A strategy will be prepared for biodiversity conservation
<p>Summary of Comments of RAG:</p> <p>Dr. Ranjeet Kumar, Scientist-E, Forest Ecology and Climate Change Division in his presentation on research project titled “Assessment of Floristic Diversity of Giri Khad Watershed, Himachal Pradesh for Developing Conservation Strategies” threw light on problem statement, backward and forward linkages review of literature, objectives, research methods, action plan, project cost and predicted outcome. The presenter highlighted the importance of Giri Khad watershed which has unique plant diversity besides catering the need of water and other benefits to the people residing in the watershed area. Dr. Kumar informed that the status of biodiversity in Giri Khad watershed is poorly known and it is important to generate database on floristic inventory, composition, structure of forest communities, status and distribution of native and endemic species and threat categorization for conservation in the watershed. The main objective is to monitor changes in vegetation pattern with respect to climate change and also to conserve and optimize floristic diversity for ensuring soil and water conservation of the watershed.</p> <p>During the discussion on the proposal, the following suggestions were made for the refinement of the proposal before submission to RPC.</p> <ul style="list-style-type: none"> • To add methodology on change in land use and land cover and functional traits studies along with ecosystem service assessment • To include weather parameters for climate change studies • To follow International Code of Nomenclature (ICN) for botanical names <p>Director, HFRI, Shimla asked the presenter to incorporate the suggestions of RAG members for refinement of the project proposal.</p>
<p>Whether the project has been modified as per RAG comments (if yes, give details):</p> <p>Yes, The suggestions of RAG members were included by the Principal Investigator.</p>
<p>Benefits of the project for the society (Not more than 100 words):</p> <p>Assessment of vegetation will provide various direct and indirect benefits to the inhabitants and cattle population residing in the watershed areas and in the surroundings. The exploration of native, endemic and threatened plants in the fragile region will help understand the community and habitat and prioritize for the management of forest, agriculture and wildlife. The outcomes of the study will help in conservation and protection of biodiversity.</p>

Project No.2	
Project title: Digitization of Herbarium, Fungarium and Insects Collection specimens of Himalayan Forest Research Institute Shimla	
ICFRE Thrust Area: Biodiversity Conservation and Ecological Security	ICFRE Theme: <i>Bio-informatics and Geo-informatics</i>
Name & Designation of the PI / Co-PI: PI: Sh. Neelesh Yadav, Scientist-E, Information Technology Co-PIs: Dr. Ashwani Tapwal, Scientist-E, FP Division Dr. Vaneet Jishtu, Scientist-D, FE&CC Division Sh. Subhash Chander, Scientist-D, FP Division Name of Division: Information Technology	Budget outlay of the Project (Rs in lakhs): Rs. 15.19 Lakhs Duration (start & end date): April, 2021 to March, 2024 No. of years: 3 Years Score on Technical criteria of Project Assessment (out of 100): 86.25

<p style="text-align: center;">Forest Protection Divisions Forest Ecology & Climate Change Division</p>	
<p>Name and cost of equipment proposed :</p>	<p>Digital Camera, Computer workstation, 6.50 Lakhs</p>
<p>Gap in knowledge identified:</p>	<ul style="list-style-type: none"> • At present no online access facility for HFRI's herbarium, fungarium and insects collection • Many Indian digital herbaria are not designed in latest web technology and even not in client – server architecture. • The recommendation of GBIF's digitization protocol not followed by many herbarium digitization projects. • International web portals / database of herbarium and other natural history collections are developed in php/mysql and java web technology. • Software development requires in client-server architecture and Digitized software will be accessible via desktop computers as well as smart mobile phones.
<p>Short term objectives of the project:</p> <ol style="list-style-type: none"> 1. To design and develop web software for digitization of herbarium, insects collection and fungarium. 2. To enter all taxonomic and available biogeographical details of every specimen in the software including digital images to develop user friendly database. 3. Bar coding and digital image capturing of each specimen of herbarium, fungarium and insect collection 4. To establish possible linkages of the database with other available database on the same line with in the institute of ICFRE, if applicable. 	
<p>Novelty of Project: By digitization of HFRI's herbarium, fungarium and Insect collection the valuable information of plants, fungi and insects of western Himalayan region i.e. Himachal Pradesh, J&K and Laddakh can be accessed easily via online medium through computer or smartphone. The novelty of this proposed HFRI's herbarium digitization project is as mentioned below (in bullet points, details was given in full project proposal); This project will provide information on;</p> <ul style="list-style-type: none"> • Detailed Species information of Western Himalayan Region • Medicinal and Aromatic Information • Biogeography and Distribution Information • Information on Invasive Species • Information on Phenology • Global Climate Change • Information on Habitat Loss and Loss of Biodiversity • Monetary Importance 	
<p>Relevance of the Project to the work already done:</p> <ul style="list-style-type: none"> • HFRI's herbarium, fungarium and insects collection digitization project will provide baseline information of plants, fungi and insects species of Himalayan region. At present currently there is no online digitized accessing facility of HFRI's Herbarium, Fungarium and Insects collection. • By this software tree / plants identification will be possible. • Digital preservation of specimens of herbarium, Fungarium and insects collection is must for long term biodiversity information of western Himalayan region and cold desert. • Digitization facilitates the democratizing of collections based research and is essential to establishing and evaluating biological baselines to assess the impacts of climate change, land-use changes, species invasions, and the current mass extinction. It allows for the mining of specimen data in much the same way that we explore organismal genomes. 	

<ul style="list-style-type: none"> • Better accuracy of information retrieval: Flowering is a seasonal phenomenon in any species and it is the main character for identification. Most of the time, trees are in the vegetative phase. In the digitization process, species with flowering along with other characters such as leaf, bark, color of stem etc. are taken into account. Therefore, it would provide better accuracy for identification. • Faster Information retrieval: Scientist / researchers/ herbarium curator can retrieve information about any species without going for detail in textbook and herbarium. Within couple of minutes, information can be retrieved from the computer or even from smartphones. • Modifiable: There will always a scope for improvement / modification at any time in the information retrieval by adding more search features in the software for better identification, as and when required.
<p>Deliverables at the end of the project:</p> <ul style="list-style-type: none"> • Online web based database software of digitized specimens of HFRI's herbarium, Fungarium and Insects Collection • Database will be query based, by which any user can access / retrieve any taxonomic information of herbarium, fungarium and insects • Query can be run based on family, genus, species name, locality, collector name, collection date, and many other details of plants, fungi and insects collection
<p>Summary of Comments of RAG:</p> <p>Sh. Neelesh Yadav, Scientist E, Extension Division (Information Technology), presented the research project titled “Digitization of Herbarium, Fungarium and Insect Collection specimens of Himalayan Forest Research Institute, Shimla” and threw light on problem statement, backward and forward linkages, review of literature, objectives, research methods, action plan, project cost and predicted outcome of the project. In his presentation Sh. Yadav informed about the collections of Herbarium, insects and fungarium in HFRI, Shimla and the need to digitally preserve these natural biodiversity collections for easy access and benefit sharing of society as per the guidelines of Convention of Biological Diversity (CBD). Sh. Yadav informed that the project aims at developing the database software system that can be fruitfully utilized for research and teaching purposes. The digitization will help in easy access of the information by different researchers besides long term preservation of herbarium.</p> <p>During discussion the following points emerged:</p> <ul style="list-style-type: none"> • With limited number of specimens in the institute, the digitisation work can be completed in one year or can be done at FRI herbarium, however, the RAG members opined that collection of specimens being a continuous process hence, needs more time, besides capacity building of the personnel and recognition of the herbarium of the institute. • Digitization of microorganism in collaboration with other institutes was also suggested to be included • Digitisation of every plant and microbe in the forest should be done • Suggested to contact Punjabi University Patiala as they have also digitized the herbarium specimens of Chamba, Kullu, Sirmaur and Shivalik hills of Himachal Pradesh • It was also suggested to submit the proposal for external funding <p>Director, HFRI, Shimla asked the presenter to include the suggestion in his revised proposal before submission to RPC.</p>
<p>Whether the project has been modified as per RAG comments (if yes, give details)</p> <p>Yes, The suggestions given by the RAG members have been included by the Principal Investigator</p>
<p>Benefits of the project for the society (Not more than 100 words): The output of this project will be a web based software which can be accessed via internet in which the all taxonomic details of plants, insects, fungi including their digital high resolution images. The software will have strong query based search engine by which anyone / stockholder can access any relevant information of HFRI's herbarium, fungarium and insects collections.</p>

Table 7: Thrust area III- Forest and Climate Change

Project No.	Nil
Project title	
ICFRE Thrust Area:	ICFRE Theme:
	Index Score project (project prioritization score)
Name & Designation of the PI/ Co-PI	Budget outlay of the Project (Rs in lakhs):
Name of Division:	Duration (start & end date):
	No. of years:
	Score on Technical criteria of Project Assessment (out of 100):
Gap in knowledge identified:	
Long term objectives of the project:	
Short term objectives of the project:	
Novelty of Project:	
Relevance of the Project to the work already done:	
Deliverables at the end of the project:	
Summary of Comments of RAG:	
Whether the project has been modified as per RAG comments (if yes, give details)	
Benefits of the project for the society (Not more than 100 words):	

Table 8: Thrust area IV-Forest Genetic Resource Management and Tree Improvement

Project No.	Nil
Project title	
ICFRE Thrust Area:	ICFRE Theme:
	Index Score project (project prioritization score)
Name & Designation of the PI/ Co-PI	Budget outlay of the Project (Rs in lakhs):
Name of Division:	Duration (start & end date):
	No. of years:
	Score on Technical criteria of Project Assessment (out of 100):
Gap in knowledge identified:	
Long term objectives of the project:	
Short term objectives of the project:	
Novelty of Project:	
Relevance of the Project to the work already done:	
Deliverables at the end of the project:	
Summary of Comments of RAG:	
Whether the project has been modified as per RAG comments (if yes, give details)	
Benefits of the project for the society (Not more than 100 words):	

Thrust area wise summary of New Research Projects proposed by the ICFRE Institutes for 2021-22

NAME OF THE INSTITUTE: HIMALAYAN FOREST RESEARCH INSTITUTE		Man Power (give number only)									
THRUST AREA	No of Projects	RA	SRF	JRF	JPF	PA	FA	TA	Con.	DEO	Total
Managing Forests & Forest Products for Livelihood Support and Economic Growth	02	--	--	--	02	01	--	--	--	--	03
Biodiversity Conservation & Ecological Security	02	--	--	01	--	02	--	--	--	--	03
Forests and Climate Change	--	--	--	--	--	--	--	--	--	--	--
Forest Genetic Resource Management & Tree Improvement	--	--	--	--	--	--	--	--	--	--	--
Total Projects	04	--	--	01	02	03	--	--	--	--	06
RA: Research Associate, SRF: Senior Research Fellow, JRF: Junior Research Fellow, PA: Project Assistant, FA: Field Assistant, TA: Technical Assistant, Con: Consultant DEO: Data Entry Operator, JPF/SPF: Junior/Senior Project Fellow											

Note: Give number only. Figures should match with Form 7 (Tables 9-12)

Thrust area wise list of NEW Projects and Detailed budget for 2021-22

Table 9: Thrust area I-Managing Forests and Forests Products for Livelihood Support & Economic Growth

Thrust area wise list of NEW RESEARCH PROJECTS															
Thrust area I: Managing Forests and Forests Products for livelihood support & economic growth															
S. No.	Project title/PI/Duration (Start and end year)	Total cost (Rs. in Lakhs) (sum of 4 to 8)	Total cost of the Project (Rs. in Lakhs)					Details of budget required for 2021-2022 (Rs. in lakhs)						Required Manpower (RA/SRF/JRF/JPF/PA/ FA etc.)	Equipment required & Cost (Rs. In Lakhs)
			Consumables (M&S)	Research Expenditure (FRE)	Travel And Conveyance (Res)-TE	Capital (Scientific Equipments)	Fellowship	Budget required for 2021-2022 (Sum of 10 to 14)	Sub-head wise breakup for 2021-2022						
									Consumables (M&S)	Research Expenditure (FRE)	Travel And Conveyance (Res)-TE	Capital (Scientific Equipments)	Fellowship		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
I)	II) Institute: Himalayan Forest Research Institute, Shimla														
01	Promotion of cultivation of <i>Picrorhiza kurroa</i> Royle ex Benth, <i>Podphyllum hexandrum</i> Royle and <i>Valeriana jatamansi</i> Jones through Community User Groups (CUG,s) in Himachal Pradesh PI: Sh. Jagdish Singh, Scientist- E Duration: 5 Years Start and end year: April, 2021-March, 2026	50.97	3.20	14.00	6.25	2.00	25.52	10.62	0.50	2.00	1.25	2.00	4.87	JPF-01 PA-01	Camera (01), Digital Caliper (03) and Digital Weighing Machine (01) Rs 2.00 Lakhs
02	Study on impact of mycorrhizal inoculations	29.93	4.50	7.10	4.20	--	14.13	6.39	2.00	1.00	0.80	--	2.59	JPF-01	NA

	on the growth and field performance <i>Abies pindrow</i> and <i>Picea smithiana</i> PI: Dr. Ashwani Tapwal, Scientist-E Duration: 5 Years Start and end year: April, 2021-March, 2026													
--	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 10: Thrust area II- Biodiversity conservation and ecological security

Thrust area wise list of NEW RESEARCH PROJECTS															
Thrust area II- Biodiversity conservation and ecological security															
S. No.	Project title/PI/Duration (Start and end year)	Total cost of the Project (Rs. in Lakhs)						Details of budget required for 2021-2022 (Rs. in lakhs)					Required Manpower (RA/SRF/ JRF/ PA/ FA etc.)	Equipment required & Cost (Rs. In Lakhs)	
		Total cost (Rs. in Lakhs) (sum of 4 to 8)	Sub-head wise breakup of total cost					Budget required for 2020-21 (Sum of 10 to 14)	Sub-head wise breakup for 2021-2022						
			Consumables (M&S)	Research Expenditure (FRE)	Travel And Conveyance (Res)-TE	Capital (Scientific Equipments)	Fellowship		Consumables (M&S)	Research Expenditure (FRE)	Travel And Conveyance (Res)-TE	Capital (Scientific Equipments)			Fellowship
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
I) Institute: Himalayan Forest Research Institute, Shimla															
01	Assessment of Floristic Diversity of Giri Khad Watershed, Himachal Pradesh for Developing Conservation Strategies PI: Dr. Ranjeet Kumar, Scientist-E Duration: 3 Years Start and end year: April,2021-March, 2024	32.66	1.25	9.00	3.00	--	19.41	12.80	0.50	5.00	1.00	00	6.30	JRF-01 PA-01	Nil
02	Digitization of Herbarium, Fungarium and Insects Collection specimens of Himalayan	15.19	0.75	0.30	0.80	6.50	6.84	9.33	0.25	0.10	0.20	6.50	2.28	PA-01	Digital Camera (01), Computer workstation

	Forest Research Institute Shimla PI: Sh, Neelesh Yadav, Scientist-E Duration: 3 Years Start and end year: April 2021- March 2024														(01), Rs. 6.50 Lakhs
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Table 11: Thrust area III- Forest and Climate Change

Thrust area wise list of NEW RESEARCH PROJECTS														
Thrust area III- Forest and Climate Change														
S. No.	Project title/PI/Duration (Start and end year)	Total cost of the Project (Rs. in Lakhs)						Details of budget required for 2021-2022 (Rs. in lakhs)						Required Manpower (RA/SRF/ JRF/ PA/ FA etc.)
		Total cost (Rs. in Lakhs) (sum of 4 to 8)	Sub-head wise breakup of total cost					Budget required for 2021-2022 (Sum of 10 to 14)	Sub-head wise breakup for 2021-2022					
			Consumables (M&S)	Research Expenditure (FRE)	Travel And Conveyance (Res)-TE	Capital (Scientific Equipments)	Fellowship		Consumables (M&S)	Research Expenditure (FRE)	Travel And Conveyance (Res)-TE	Capital (Scientific Equipments)	Fellowship	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
D) Institute:														
	NA													

Table 12: Thrust area IV- Forest Genetic Resource Management and Tree Improvement

Thrust area wise list of NEW RESEARCH PROJECTS														
Thrust area IV- Forest Genetic Resource Management and Tree Improvement														
S. No.	Project title/PI/Duration (Start and end year)	Total cost of the Project (Rs. in Lakhs)						Details of budget required for 2021-2022 (Rs. in lakhs)					Required Manpower (RA/SRF/ JRF/ PA/ FA etc.)	
		Total cost (Rs. in Lakhs) (sum of 4 to 8)	Sub-head wise breakup of total cost					Budget required for 2020-2021 (Sum of 10 to 14)	Sub-head wise breakup for 2021-2022					
			Consumables (M&S)	Research Expenditure (FRE)	Travel And Conveyance (Res)-TE	Capital (Scientific Equipments)	Fellowship		Consumables (M&S)	Research Expenditure (FRE)	Travel And Conveyance (Res)-TE	Capital (Scientific Equipments)		Fellowship
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
I) Institute:														
	NA													

Form-8

Table: Tentative total budget requirements (Ongoing, Ongoing with Change Request and New Research Projects) for 2021-2022 of ICFRE Institutes (Rs in lakhs)

Institute: Himalayan Forest Research Institute, Shimla

Sl. No	Institutes	Consumables (M & S)	Research Expenditure (FRE)	Travel and conveyance (Res) - TE	Capital (Scientific Equipments)	Fellowship	Total (A)
		Requirements of research projects					
1	Ongoing Projects	3.50	9.10	7.45	--	26.93	46.98
2	Ongoing with CHANGE REQUEST	0.50	1.00	2.05	--	7.32	10.87
3	New Projects (For first year of the project)	3.25	8.10	3.25	8.50	16.04	39.14

Note: Total should match with Form No. 1(Tables 1-4), 2 and 7(Tables 9-12).

Form-9

Table: Budget required for 2021-2022 for research activities other than research projects (Rs in lakhs)

Name of the Institute: **Himalayan Forest Research Institute, Shimla (H.P.)**

Sl. No	Proposed Activities	Consumables (M & S)	Research expenditure (FRE)		Travel and conveyance (Res) - TE	Capital (Scientific Equipments)		Maintenance of equipments used in research	RAG Meetings	Total
			General FRE	Engagement of unskilled / skilled worker (other than research projects)		Part of Approved research projects*	Not part of research projects			
1.	e.g. Maintenance of Nurseries	1.00*	--	--	--	--	--	--	--	1.00
2.	Maintenance of plantation, research plots	0.60**	--	--	--	--	--	--	--	0.60
3.	Maintenance of scientific equipments, labs	--	--	--	--	--	--	06.00	--	06.00
4.	Maintenance of field station	--	--	14.04***	2.00****	--	--	--	--	16.04
5.	Working Plan	--	--	--	--	--	--	--	--	--
6.	Seed bank	--	--	--	--	--	--	--	--	--
7.	Patent fees	--	--	--	--	--	--	--	--	--
8.	RAG Meeting	--	--	--	--	--	--	--	02.00	02.00
	Total	1.60	--	14.04	2.00	--	--	06.00	02.00	25.64

Note:

*Figure should match with requirement of research projects.

While giving the requirements, Institutes are requested to include their Research Centers also.

Justification: Provide proper detailed justification on separate sheet for the above budget requirement.

This table is for budget requirement for maintenance of nurseries/plantation/research plots, maintenance of scientific instruments, maintenance of laboratories, maintenance of field stations, laboratories, equipments, seed bank, patent fees and working plan etc.
Examples under proposed activities are given, may vary from Institute to Institute. The budget in this table will be discussed during RPC. Directors therefore are requested to come prepared.

Justification for the above budget requirement:

* Denotes the budget required for the purchase of nursery implements etc.

** Denotes the budget required for purchase of FYM etc.

*** Denotes the budget required for the engagement of labour for maintenance of Field research stations/nurseries.
(9 nos X 12 months X @13000/- per month= 14.04)

****Denotes the budget required for visits to Field research stations/nurseries regarding proper supervision.

CONCLUDING REMARKS

Dr. Rajesh Sharma, GCR informed that there is no proposal for any mid-term modifications in the approved projects.

At the end, **Dr. S.S. Samant, Director, HFRI, Shimla** once again thanked the Hon'ble Members of RAG to attend this important meeting.

Director, HFRI requested all the RAG Members to give their overview about the ongoing research projects and on the new research projects.

Dr. J.L.N. Sastry, Chief Executive Officer, NMPB, New Delhi thanked the Director, HFRI for giving an opportunity to be part of RAG of HFRI and appreciated the research projects presented before the RAG being need based and well conceptualized with scientific input. He requested to incorporate the relevant suggestions put forth by the Hon'ble Members in the research proposals.

Shri Surender Mohan Gupta , Proprietor, Natural Biotech products, Mandi thanked the Director, HFRI, Shimla for making him member of RAG and the scientists for preparing proposals aimed benefiting the stakeholders.

Professor Bhupinder Gupta, Dean College of Forestry Dr. Y.S. Parmar University of Horticulture & Forestry, Nauni, Solan appreciated the concept and research proposals presented by the scientists of the institute and suggested for refinement of the proposals in the light of suggestions given by RAG members for better results.

Prof. Sanjeev Thakur, Head, Tree Improvement & Genetics resources, UHF, Nauni, Solan suggested the principal investigators of new research projects to make refinement in their proposal as per the suggestions of the RAG members for better output.

Sh. Preetpal Singh, CCF, Leh hoped that project proposals of HFRI, Shimla will benefit the stakeholders in Ladakh region as well.

Dr. Sushil Kapta, Director, Census, Operation and Citizen, Shimla urged the scientists of HFRI to work on issues of climate change and take up long term projects in the changed scenario globally.

Dr. K.S. Kanwal, Scientist- In Charge G.B. Pant National Institute of Himalayan Environment, Himachal Regional Centre, Mohal-Kullu thanked the Director, HFRI for making him member of Research Advisory Group and suggested for collaborative research with other research organisations in the institute's future endeavor.

Dr. Arvind Bhatt, Dean, Planning and teachers' Matter, HPU, Shimla, thanked Director, HFRI, Shimla for giving an opportunity to be part of the Research Advisory Group of the institute and hoped that the project proposal placed before the RAG will also be approved by the apex body and the scientist will produce tangible results to benefit the community at large.

Professor (Retd.) S.P. Bhardwaj, UHF, Nauni, Solan, appreciated the efforts of the institute as new project proposals were put forth despite running 15 All India Coordinated Research Projects. Dr. Bhardwaj appreciated the proposal on Digitization of Herbarium, fungarium and insect collection as it being a continuous process will bring HFRI, Shimla on global map.

Prof. (Retd.). T.N. Lakhanpal, HPU, Shimla congratulated Director, HFRI, Shimla and his team for preparing project proposals aimed at benefiting the stakeholders and the society at large. He also thanked the Director for considering his candidature for RAG of the institute.

Prof. (Retd.). M.K. Seth, HPU, Shimla thanked Director, HFRI for preparing and presenting project proposal directly related to the issues of immediate concern be it Giri Khad watershed catchment or role of Community User Groups (CUGs) in promoting cultivation of medicinal plants.

The RAG, during the deliberations to evaluate the new projects, suggested a few modifications in some project proposals. While according 'in principle' approval to such project proposals, the RAG authorized the Director, HFRI- the Chairman of the Committee, to recommend these research projects after the PIs duly incorporate suggestions of the RAG in the project proposals.

At the end, Dr. S.S. Samant, Director, HFRI and Chairman of RAG once again thanked the Hon'ble Members of RAG for sparing their valuable time and joining this important Meeting and providing valuable inputs.

VOTE OF THANKS:

At the end, **Dr. Rajesh Sharma, Scientist-G, Group Coordinator Research and Member Secretary, RAG Meeting** proposed a Vote of Thanks to the Hon'ble Members of RAG and other distinguished participants for sharing their experience and providing best suggestions for fine tuning of the proposed research proposals. He added that the Scientists of this Institute will definitely be benefited from the fruitful interactions held during the day. He also thanked the Director, HFRI and the team of Research Coordination Division and IT Cell of the institute for making this event a success.

