

HUMAN RESOURCE DEVELOPMENT PLAN (2018 – 23)



**INDIAN COUNCIL OF
FORESTRY RESEARCH & EDUCATION**



HUMAN RESOURCE DEVELOPMENT PLAN (2018 – 23)



**INDIAN COUNCIL OF
FORESTRY RESEARCH & EDUCATION**

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पर्यावरण, वन एवं जलवायु परिवर्तन मंत्री
भारत सरकार

MINISTER OF ENVIRONMENT, FOREST
AND CLIMATE CHANGE
GOVERNMENT OF INDIA



MESSAGE

I am happy to know that Indian Council of Forestry Research and Education has prepared a five year HRD Plan. Human resource development is a blue print designed for achieving the best potential of employee of any organization by enhancing their knowledge base and skill. Training and capacity building are important features of enhancing competency and capacity of individuals working in an organization. In order to keep the human resource well informed, ahead of times and at high competence level, a well conceived and meticulously planned organizational HRD programme is an imperative. The HRD Plan of ICFRE will transform the employees by developing strategic human resource management system which shall look at the individual as a vital resource to be valued, motivated, developed and enabled to achieve ICFRE's mission and objectives.

HRD Plan of ICFRE will help in capacity building of employees and also help them in imbibing spirit of innovation, enquiry and vision so as to develop their capacity towards anticipating and analyzing a research problem and exploring the best ways and means to solve them.

I congratulate the Indian Council of Forestry Research & Education, ICFRE for formulating Human Resource Development Plan 2018-23 for capacity enhancement of ICFRE employees, and hope that it will help the Council in meeting the contemporary forestry research challenges.

(Dr. Harsh Vardhan)

डॉ. महेश शर्मा
Dr. Mahesh Sharma



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भारत सरकार

MINISTER OF STATE (I/C) OF CULTURE
MINISTER OF STATE FOR ENVIRONMENT,
FOREST AND CLIMATE CHANGE
GOVERNMENT OF INDIA



MESSAGE

A comprehensive human resource development plan is crucial for any organization to meet its goal and objectives in a most efficient manner. Effectiveness of any organization is significantly dependent on the availability of in-house expertise of trained researchers and managers to achieve scientific breakthroughs in the face of complex forestry challenges faced today. We should give due importance to human resource development by providing opportunities to the employees to grow and develop so as to keep pace with the dynamic process of change within and outside the system.

Capacity enhancement and modernization of resources go hand in hand so that optimum use of human and other resources could be made. HRD Plan 2018-23 prepared by ICFRE will expose the scientists, technical staff and ministerial staff to latest technologies, scientific procedures, scientific advancement, rules and procedures etc. to equip them to discharge their responsibilities in a more effective manner.

I congratulate ICFRE for formulating the HRD Plan 2018-23 which will certainly help in increasing the skills and efficiency of ICFRE employees to keep them abreast with the current thinking and trends in the forestry research.

(Dr. Mahesh Sharma)

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भारत सरकार

SECRETARY
MINISTRY OF ENVIRONMENT,
FOREST & CLIMATE CHANGE
GOVERNMENT OF INDIA



MESSAGE

I am glad to know that Indian Council of Forestry Research and Education (ICFRE) has formulated the Human Resource Development Plan 2018-23 for capacity building for its employees. There is urgent need for new paradigm approaches to human resource development in forestry research in order to build capacity of employees to enable them to give the desired output for sound research back up support to forestry sector. Capacity building is a permanent challenge as there are always new S&T developments on the horizon.

A considerable focus and investment on human resources are needed to manage the forestry resources effectively and sustainably. HRD Plan will enhance the core competence of the employees of ICFRE in their area of specialization through various training programmes.

I wish ICFRE employees a very good future and am confident they will continue to excel.

(C. K. Mishra)



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DIRECTOR GENERAL OF FOREST & SPL. SECY.
MINISTRY OF ENVIRONMENT,
FOREST AND CLIMATE CHANGE
GOVERNMENT OF INDIA



MESSAGE

Forestry science like any other stream has evolved through complex system of experimentation and observation both in field and laboratory. It has evolved from simple silvicultural field based experiments to complex processes of laboratory, thus continuously adding to the store house of basic and applied knowledge, which has helped in furtherance of forestry science. Capacity building enables the organization and their leaders to develop competencies and skills that can make them more effective and sustainable. Capacity building of the employees of ICFRE through HRD Plan 2018-23 will help them in linking forestry with goals for increasing forest cover and enhancing forest productivity through operationalization of National Forestry Action Programme and National Forestry Research Plan.

I take this opportunity to congratulate Indian council of Forestry Research & Education for formulating and meticulously planned HRD Plan 2018-23 for the employees for achieving their best potential by enhancing knowledge base and skill.


(SIDDHANTA DAS)



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FOREWORD

Capacity building is a developmental approach that focuses on understanding the obstacles that inhibit people, governments and organizations from realizing their developmental goals while enhancing the abilities that will allow them to achieve measurable and sustainable results.

Human Resource Development (HRD) is essential for the employees of any organization to help them in a continuous and planned way to sharpen their capabilities, raise standards and motivation levels, improve attitudes required to perform various functions, develop their general capabilities as an individual and discover and exploit their own inner potential for their own and organizational development purpose. The effectiveness of HRD Plan is essential for the availability of trained researchers and managers to achieve scientific breakthrough in the face of contemporary complex challenges.

The HRD plan for capacity building of employees of ICFRE has been prepared with the objectives to increase the management and core skills of officers, researchers, technical, ministerial and executive staff to keep them abreast with current thinking and trends in the sector. The HRD Plan for the period 2018-23 includes a number of specialized training programmes at national and international level for achieving its objectives.

I appreciate the efforts put in by the Directorate of Education, HRD Plan committee members and staff for preparing the HRD Plan (2018-2023) for capacity building which will improve the capacity of officers/scientists, technical, administrative/ministerial staff of the Council in bringing a substantial improvement in the quality and delivery of research outputs.

(Dr. Suresh Gairola)
Director General

Indian Council of Forestry Research & Education



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Dr. Neelu Gera, IFS

Deputy Director General
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Indian Council of Forestry

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PREFACE

Institution of a comprehensive human resource development plan is crucial for any organization. An investment in training and education is sure a payoff. To achieve scientific breakthrough in the face of complex contemporary forestry challenges, a well conceived and planned HRD Plan for the employees of ICFRE is the need of the hour.

The HRD plan for capacity building of scientific/managerial cadre and research support staff of the council has been prepared with the objectives to increase the core, adaptive and managerial skills of officers, researchers and other staff to keep them abreast with current thinking and trends in forestry sector. The plan endeavours to enhance the core competence of the researchers in their areas of specialization through trainings, professional interactions, research workshops and seminars as well as in-service training in professional skills; lab management, field investigations, etc. for all levels of technical and supporting staff.

The Plan prescribes a number of specialized training programmes at the national and international levels for achieving aforesaid objectives. In the earlier HRD Plan, many scientists/officers/support staff were imparted training on various forestry themes at ICFRE and its Institutes, while the present plan envisages to provide capacity building inputs for all levels of employees.

The efforts put in by the committee constituted for the purpose and headed by Deputy Director General (Administration) are duly acknowledged, as the extensive deliberations with Directors, researchers and other employees paved the way for preparation of a comprehensive plan.

I appreciate the efforts put in by Sh. N.C. Saravanan, Assistant Director General (Education and Recruitment Board) and the members/staff of Directorate of Education for their contribution in preparing the HRD Plan (2018-2023) for capacity building which will enhance the professional capacity of different cadres of the Council.

(Dr. Neelu Gera)

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N.C. Saravanan, IFS

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PREFACE

The Human Resource Development Plan for the period from 2018-19 to 2022-23 has been prepared incorporating training and capacity building programmes for all the categories of ICFRE personnel i.e, scientists, technicians, ministerial and executive staff which is a key feature of this plan over the previous plan. Induction training after recruitment of all the categories of ICFRE personnel along with subsequent professional skill upgradation programmes has been proposed in this plan to impart necessary competence to carry out the mandate of this council. Apart from catering to the training and capacity building needs of ICFRE personnel, this plan also prescribes other HRD initiatives like awards for scientists as well as other personnel for motivation of this vital human resource of the council.

The HRD plan has been finalized after an elaborate process of need analysis and brainstorming with ICFRE personnel as well as the Directors of the institutes and officials in ICFRE (HQ). I would like to thank the committee chaired by Sh. A.S.Rawat, DDG (Admin) for their immense contribution in carrying out an elaborate need analysis and preparing the detailed recommendations for training and capacity building. My thanks are also due to Dr. Amit Pandey, Scientist G and member secretary of the committee and all the other members. Though it would be difficult to mention everyone, I would like to thank all the scientists and other ICFRE officials and staff who have contributed to the preparation of the HRD plan.

I also acknowledge the valuable inputs provided by the Directors of all ICFRE institutes, Sh. Vipin Chaudhary Deputy Director General (Extension), Sh. S.D.Sharma, Deputy Director General(Research), Dr. Rajeev Tiwari, Secretary, ICFRE and all the Assistant Director Generals. The support rendered by Dr. Anil Negi, Scientist-D in finalisation of the plan and publishing of this document is acknowledged. I would like to thank Dr. Suresh Gairola, Director General, ICFRE and Dr. Neelu Gera, Deputy Director General (Education) for their support and guidance in finalizing and publication of this HRD plan.

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**Capacity
Building and
Training
for ICFRE
Personnel**

CHAPTER 1

Capacity Building and Training for ICFRE Personnel

1.1 INTRODUCTION

Established in December 1986, The Indian Council of Forestry Research and Education (ICFRE), is an autonomous Council of the Ministry of Environment, Forests and Climate Change Govt. of India. The council has been mandated to manage and coordinate research, education and extension in the field of forestry at the national level to address both contemporary and potential challenges in the field. Under the ICFRE umbrella, there are currently nine institutes and five research centres in different bio-geographical regions with the specific objectives of addressing research, education and extension issues of their respective mandated areas. Being the apex national body in this field, the ICFRE caters to forestry research needs by identifying scientific problems and issues faced by the stakeholders and carries out research planning, execution, promotion, coordination and extension related to different aspects of forestry.

ICFRE supports research in areas such as productivity enhancement, silvicultural practices, forest mensuration and biometrics, forest health, tree propagation and improvement, forest resource survey and management, biotechnological research, eco-restoration of degraded lands, economic evaluation of forests, value addition and utilization of forest produce, agroforestry model development for different agro ecological zones, biodiversity conservation, carbon budgeting, climate change, environmental impact assessment and policy research. By regular interaction with the user groups and stakeholders such as state forest departments, forest based industries, farmers, NGOs and rural entrepreneurs, ICFRE and its institutes identify research issues, knowledge gaps and problems; prioritise, plan and execute research projects; and disseminate the outcomes, technologies, recommendations and protocols through awareness programmes, academic courses, workshops, seminars, trainings and other extension activities.

1.2 NEED FOR HRD PROGRAMME

A team of highly motivated and self-driven professionals and support staff is essential to ensure the quality performance and delivery of a research organization. In order to keep the human resource well informed, ahead of their times and at high competence level, a well-conceived and meticulously planned organizational HRD programme is needed. In recent times, a multidimensional approach in forestry research has necessitated that the existing manpower be entrusted with greater responsibilities and diversified roles in the current organizational set-up. Human Resource Development is a blueprint designed to help the employees to achieve their best potential by enhancing their knowledge base and skills, and thus their abilities in their respective fields of expertise. Organisational development and mandate accomplishment can be achieved through targeted trainings, conducive work environment, increased opportunities for career growth, succession planning, recognizing the performance and identification & mentoring of high performers for specific jobs.





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Research needs and forest related problems change with time due to mounting pressure on the limited resources, newer challenges imposed by changing seasonal and climatic patterns, industrial advancements, shift in demand and supply, increasing role of forestry in rural economy and changing socio-economic scenario. This necessitates providing the researchers with newer perspectives, inputs and expertise to enhance their abilities to assess the problems and offer novel unconventional solutions. This further emphasizes a greater need for human resource management with enhanced objectivity.

To address and resolve the key questions of national / global requirements, trends and emerging fields, there is need of research groups of selected specialists having knowledge of latest advancements and better grasp of the problems. A continuous training programme and exposure of identified human resource in selected specialized fields is of utmost requirement for a successful research venture.

An elaborate exercise has been conducted for designing an effective HRD plan. While identifying the training needs, the organizational mandate, priority research areas, directions and recommendations emerging from a series of deliberations and discussions were considered. Within the discipline or field of expertise, the training areas were also prioritized, having regard to the limited availability of resources.

Currently, ICFRE has initiated a major policy shift in its research planning process. The Council is giving priority to All India Coordinated Projects (AICRPs) over stand-alone projects. Since the scope of coordinated and collaborative projects consists of issues of national and regional importance and involve mandate areas and scope of more than one institute or organizations, the training needs have been assessed and analyzed to meet these increased technical requirements.

The HRD programme is also flexible and could be reviewed yearly before finalizing the yearly training programme of scientists, technical and other staff. Equally important is that the topics identified must have some flexibility depending on the emerging needs and requirements. The HRD plan has been finalised on the basis of deliberations with the ICFRE personnel, directors of institute as well as various brainstorming sessions in the ICFRE (HQ).

1.3 HRD PLAN PERIOD

This human resources development plan has been aimed to be implemented during the next five (5) years i.e., from 2018-19 to 2022-23.

1.4 OBJECTIVES OF PLAN PERIOD HRD PLAN PERIOD

- To develop the best manpower for achieving the mandate of the council.
- To provide a propelling platform for the newly inducted personnel through foundation trainings and specialized orientation programmes.
- Exposure of scientific personnel and senior managers to the latest global forestry research trends, research administration and technological developments for enhancing research capabilities, management and scientific skills.



- To enhance the core competence of researchers in their area of specialization.
- To augment the perceptivity and skill of research support staff with respect to research methodologies data collection, analysis and field laboratory expertise through in-service training programmes.
- To update administrative staff with the latest amended rules, regulations and office procedures.
- To upgrade the skills of the executive staff in specific subjects required for working in the Council.
- To motivate the scientific manpower and other personnel by recognizing their contribution in forestry research and administration.

1.5 TRAININGS TO BE IMPARTED

In order to keep pace with international developments and challenges within the country and to utilize recent scientific advancements for the benefit of science and stakeholders, a robust HRD plan for ICFRE and its institutes needs to be conceived and executed. Formulating a strategy for enriching the human resource and its continuous review requires assessment of priority research areas, available expertise, recommended modifications, emerging challenges, etc. Certain training requirements are common to all ICFRE institutes, such as statistical design of experiments and data analysis, basics of instrumentation and their handling, interpretation of instrumental outputs and chemical assays, geomatics, application of remote sensing and GIS in different fields, research writings, etc., However, due to the specific nature of their individual mandates, ICFRE personnel also require highly specialized trainings, customized to their particular needs. Examples of such specialized trainings include bio-pesticide formulations, nanotechnology, bio-prospecting, genetic engineering, taxonomic identifications, etc.

In view of the training needs as mentioned above, the requirements were pooled from different ICFRE institutes and categorized with respect to disciplines and then subcategorized under particular disciplines considering the commonality and specificity of proposed topics. Such categorized data was further discussed with the subject matter specialists, thus short listing and identifying core areas where inputs are required. The trainings were also assessed from the aspect of addressing varying requirements at scientist, technical staff and other levels. Trainings including interpretation of data have been prioritized over those involving usage of advanced instruments. This is due to the fact that many of such equipments because of their high costs may not be currently available with the ICFRE institutes and tasks involving them are usually outsourced. Further, as the trainings have been proposed discipline-wise and topic-wise, periodical review of trainings to be imparted would be required.

In the previous HRD plans, the trainings for administrative staff were not proposed. However, in the current plan, the training needs in different areas for all categories of staff were assessed and proposed. Similarly, induction training has been proposed for all categories of personnel after recruitment. A brief summary of the trainings planned to be imparted in next five years to different categories of personnel is give below:



1.6 SCIENTISTS

The following categories of training have been proposed in view of the training needs at various stages in the career of a scientist for achieving organizational goals and fulfillment of stakeholder's requirements:

1.6.1 CATEGORY I – Orientation Training:

Currently, the newly recruited scientists are posted in the institutes immediately after the recruitment and the twelve weeks induction training is organized when a reasonable number of newly recruited scientists are available. However, the newly recruited scientists need to be exposed to the essential elements of the institutes, the research programmes and administration so that they can be engaged more productively even before the induction training. In view of this, two week orientation training is proposed for the newly recruited scientists in the institutes of their posting immediately after their joining. This training will include attachments to various divisions like the administrative wing, Group Coordinator Research (GCR), various divisions of the institutes, state forest departments, visit to other research institutes/organizations near their place of posting, etc., The respective institutes will work out a detailed training schedule and the scientists will be required to submit a report on the learnings received during this two week course.

1.6.2 CATEGORY II - Induction Training:

Under the previous HRD plan, the induction training was organized for the newly recruited Scientists for a duration of eighteen weeks. However, after due consideration of training requirements and in light of the introduction of the orientation training, the duration of this training has been reduced to twelve weeks. The main objective is to present the newly recruited scientists, an overview of forestry and forestry research and to acquaint them with the operational and professional culture of the Council. This will provide them with crucial insights into their scientific mandate, which they will further develop in due course. This induction training shall be organized within the residency period of Scientist B. Two induction training courses are proposed to be taken up in next five (5) years.

1.6.3 CATEGORY III - Professional skill upgradation training

In the earlier HRD plan, the professional skill upgradation trainings was designed for Scientists levels of B to E. However, in this plan, this training is recommended only for scientist levels C to G as separate provision of training for Scientist B has been made as mentioned in Category I and II in the previous sections of this chapter. As per the MFCS norms, minimum residency period for promotion of Scientist B to next grade is three years. During this span of three years, the scientists will be receiving two trainings (Category I & II). Advance trainings on specialized subjects are also required for senior scientists to keep pace with the technological developments. In Category III, more emphasis will be given to further develop competence of the scientists by providing exposure to recent advancements in their field of expertise with special emphasis on the research inputs likely to be used for ongoing and emerging issues at hand. This will also help in developing required infrastructure apart from knowledge enrichment and better project outcome.

Senior scientists are a very valuable human resource due to the vast knowledge base and experience in handling scientific challenges gained over the course of their careers. They are expected to work as mentors and manage target oriented research with concrete deliverables. Therefore, training in research information management, intellectual property issues,



leadership skills and global and national issues requiring forestry interventions etc. needs to be incorporated in the HRD plan. Exposure at international forums through seminars/workshops/conferences for facilitating assimilation of current trends and developments in their respective disciplines also forms an integral part of HRD planning. At least one training for each of the scientists is proposed during this HRD plan period and a total of 49 national and 33 international trainings have been recommended in this category.

1.7 TECHNICAL STAFF

Technical staff forms the backbone of any research organization. The nature of their jobs requires expertise in laboratory procedures, sampling and sample analysis, handling of specialized equipments, use of glassware & chemicals, etc., Thus their exposure to state of the art laboratories and hands on laboratory training is mandatory. Training in field data collection, experimental design and statistical analysis is another essential component. Induction training after recruitment as well as subsequent professional skill upgradation trainings are proposed in this HRD plan. A total of 43 training courses have been identified for the Technical staff in ICFRE for skill upgradation and knowledge acquisition in the latest technologies in the scientific research, scientific equipments and laboratories, collection of data etc.

1.8 ADMINISTRATIVE STAFF

This is a new category incorporated in the HRD plan of ICFRE trainings. A two week induction training after recruitment as well as subsequent professional skill upgradation trainings is proposed in this HRD plan. The professional skill upgradation trainings are proposed in subjects like office procedures, accounts and goods and services tax (GST), preliminary translation training, dynamics of right to information, financial accounting system, ethics & values in public governance/good governance, gender sensitization, e-procurement & purchase management in government, audit, roster writing and reservation in services, Govt. policy for SCs, STs, OBCs & differently-abled individuals and recruitment rules in Government departments, autonomous bodies & PSUs etc. A total of nine trainings have been recommended for skill upgradation of administrative staff.

1.9 EXECUTIVE STAFF

Executive staff like Forest Guards and Foresters are recruited by the Institutes. Trainings for these executive staff during induction and later in their career is essential for imparting required skills and to keep up their motivation. As the new recruitments by the ICFRE institutes are infrequent and are on small scale, the induction trainings will be organized by the institutes in State Forest Academies. The induction training will not be required for the executive staff who are promoted from a lower rank in the executive cadre. The institutes will also organise atleast one professional skill upgradation training of one week duration during this HRD plan period for all the executive staff either in their institutes or in the State Forest academies/other organisations in subjects like protection, silviculture, administration and office procedures, wild life management, etc.

1.10 SEMINARS/WORKSHOPS/INTERNATIONAL TRAININGS/EXPOSURE VISITS, ETC.

Researchers working in different fields across the globe get an opportunity to interact more informally during seminars,





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workshops and conferences. The exchange of ideas during such events provides the participating scientists with a broader understanding of their subject, which, in turn benefits the organization. As such, ICFRE encourages such interactions among peers. Though the funding of international workshops would greatly rely on budgetary allocations, a part of the expenditure (e.g., part of registration fees/travel) may be provided, wherever possible, depending on budget allocation. International training programmes for scientists and exposure visits for senior managers are also proposed so as to expose them to latest global trends in forestry research and research administration and associated technological developments.

1.11 ORIENTATION PROGRAMME FOR OFFICERS ON DEPUTATION

Besides Scientists, ICFRE also appoints IFS and SFS officers at various levels on deputation. These officers particularly at the DCF level are required to be exposed to various divisions of the institute, research, extension and education activities, etc., to understand the working of the council and to enable the officers to work with a holistic approach right from the beginning. A one week orientation programme will be organized by the institute for these officers at the DCF level immediately after joining the institute.





**CAPACITY
BUILDING OF
SCIENTISTS**

CHAPTER 2

CAPACITY BUILDING OF SCIENTISTS

2.1 ORIENTATION TRAINING

Two week orientation training is proposed for the newly recruited scientists in the institutes of their posting immediately after their joining. This training will include attachments to various divisions like the administrative wing, Group Coordinator Research (GCR), various divisions of the institutes, state forest departments, visit to other research institutes/organizations near their place of posting, etc., The respective institutes will work out a detailed training schedule and the scientists will be required to submit a report on the learnings received during this two week course.

2.2 INDUCTION TRAINING

Subsequent to the orientation training, the newly recruited scientists will undergo an induction training of twelve weeks duration.

GENERAL GUIDELINES

1. The induction training shall be imparted by Forest Research Institute, Deemed to be University, Dehradun.
2. A mechanism shall be devised by the FRI, Deemed to be University in consultation with ICFRE for assessing periodic progress.
3. The subjects as mentioned in each module is indicative of the broad thematic areas to be focused on in the modules.
4. Lectures/discussion may be arranged with experts through video conferencing, wherever possible.
5. A sound evaluation system will be inbuilt into the training, with properly designed formats.
6. A participative approach should be adopted in the trainings with special focus on case studies, experiential learning, discussions, brainstorming and practical exercises.
7. Optional activities such as sports, social and cultural programmes/events, etc., should be facilitated in order to boost motivational levels.

The estimated budget for one induction course for a group of fifteen persons is approximately Rs 18 lakh and assuming that there may be three such induction courses during the next five year, an amount of Rs 54 lakhs is estimated for this purpose.

INDICATIVE COURSE DESIGN FOR INDUCTION TRAINING

Module I - Forestry Administration, Office Procedures & Administration	
Week-I - II	Forest Administration 1. Overview of ICFRE and institutes, forest administration in India, structure and function of various forestry organizations, overview of forestry in India, challenges & opportunities, forest policies and





	<p>legislation (important Acts), overview of forestry programmes (JFM, GIM, NAP etc.), forestry organizations (international and national), changes in forestry sector at global and national level, international conventions</p> <ol style="list-style-type: none"> 2. Visit to other Institutes WII/CSWCTRI/FSI. <p>Administration and Office Procedures</p> <ol style="list-style-type: none"> 1. General management concepts and principles, organizational behavior, leadership, motivation, group dynamics and team building, conflict resolution, HRD and personnel management, effective communication & presentation skills, personality development, career progression and planning. 2. Handling office correspondence, file management, preparation of notes & drafts, manual of office procedures, service and establishment rules, accounting procedures, procurement procedures and rules, public services doctrine and conduct, right to information and other aspects. <p>Research, Extension, Education</p> <ol style="list-style-type: none"> 1. Mission, goal, vision, thrust areas and themes, research prioritization/NFRP, Institutional setup for research in ICFRE including RAG/RPCs, etc., procedures /guidelines for the project preparation and implementation, Monitoring and evaluation of research, other activities of Directorate of Research. 2. Insight into activities of Directorate of Extension-media and publication, National Forestry Extension Plan, forest database and EIA works. 3. Activities of Directorate of Education-Centre of Forest Policy Research, forestry education system, networking with universities and other activities of the Directorate.
<p>Module II - Project Management & Research Methodology</p>	
<p>Week III & IV</p>	<p>Project Management</p> <p>Propounding research proposals, scientific values and professional ethics in research proposal writing, skills for scientific research paper and research report writing, brainstorming techniques, project designing, preparation on concept papers and technical notes, project management techniques, funding agencies and approach, periodical reporting.</p> <p>Research Methodology Module</p> <p>The module will comprise concepts and applications of statistics in forestry research with hands on workshops on statistical software with case-studies.</p> <ol style="list-style-type: none"> 1. Observations, data and their measurement scales, frequency distributions, central tendency, dispersion, skewness, kurtosis, influential point & outlier, presentation of data, probability and its applications in data analysis, binomial and normal/Weibull and Johnson distributions and their



	<p>applications, framing and testing hypotheses for research, parametric and non-parametric tests, bi-variate analysis – correlations and regressions analysis of variance and covariance.</p> <ol style="list-style-type: none"> 2. Designing lab and field experiments in forestry – CRD, RBD, LSD, designs for optimization, alpha-designs, factorial, split-plot, incomplete block design, basic socio-economic tools and techniques, planning sample surveys: development of questionnaires and data collection forms, sampling techniques commonly used in forestry. 3. Basic multivariate analysis – multivariate ANOVA, cluster analysis, principal component analysis, factor analysis, multiple regression analysis, non linear regression, use of state space approach.
Module III - Forestry Overview and Tours	
Week V & VI	<p>Forestry Overview</p> <ol style="list-style-type: none"> 1. Silviculture classifications, forest types, important species, forest management imperatives and principles, sustainable forest management, mensuration, biometrics, growth modeling, forest certification, forest working plans, tree improvement, productivity of forest and plantations, joint and participatory forest management, 2. Forest protection including forest fires, non timber forest products 3. Cultivation, Harvesting, processing, storage and marketing of forest produce 4. Wildlife management 5. Wood Science and technology 6. Extension forestry and agro forestry 7. Forest ecology and biodiversity conservation 8. Soil and water conservation approaches, tools and techniques and watershed management and hydrology, 9. Environmental management, environmental impact assessment, forest carbon & climate change, carbon budgeting and trading, IPR/bio safety issues etc.
Week- VII	<p>North India Tour</p> <ol style="list-style-type: none"> 1. Visit to Dr. YS Parmar University of Horticulture and Forestry, Visit to HFRI, Shimla and experimental areas and other forest areas. 2. Interaction with State Forest Departments and Forest Corporations. 3. Visit to CSKHPKV, Palampur , IHBT(CSIR), Yamuna Nagar/Star Paper Mill/CPPRI/Phagwara and exposure on clonal forestry and private enterprises.



Week-VIII	<p>South India tour</p> <ol style="list-style-type: none"> 1. Visit to Institute of Forest Genetics and Tree Breeding (IFGTB)/labs, Two days module on Forest genetics & planting stock improvement, forest biotechnology, 2. Field visit to Seed Production Area (SPA) , experimental plots of different divisions, 3. Interaction with State Forest Departments and Forest Corporation, protected areas management and biodiversity conservation. 4. Visit to IWST and one day module on wood properties, preservation, utilization, wood composites and modified wood. 5. Visit to IPIRITI and IISc, Bangalore
Week – IX	Status of research in various subjects , knowledge gaps and current research , AICRPs, priority areas, etc.
Module IV - Specialization Module	
Week-X-XI	Attachment with an identified division preferably in the area of proposed specialization, either in an institute of ICFRE or other organizations for three weeks. The scientist will also be attached to a senior scientist (Scientist E and above) during which the trainee scientist/researcher will develop a working paper on a pre-assigned topic and convert into a project. The topic will be decided by a panel of experts in the relevant field of specialization of the trainee. Mentoring will also be in the form of a structured programme and will be monitored and evaluated.
Module V - ICT and GIS	
Week - XII	<ol style="list-style-type: none"> 1. ICT Application in ICFRE/research, computer application – Microsoft excel, access database and other applications. Database management system. IFIRIS and its various modules. Hands on working on IFIRIS system. 2. Remote sensing and GIS application in forestry, handling GPS in surveys and data collection, Working with GPS data, sampling, trails etc, visit to FSI/IIRS 3. Experience sharing workshop to be held at ICFRE/FRI-DU. The participants will present the working papers and projects before a panel of experts and will be evaluated for the training. 4. Valedictory and closure of the course.

The above module/course design is indicative and further improvements as and when necessitated may be modified by the Directorate of Education according to the specific needs and requirements. During the induction training period, training visits of scientists to various organizations/sites may be increased for more exposure as per the requirement.



2.3 PROFESSIONAL SKILL UPGRADATION TRAININGS

The advanced professional skill upgradation trainings have been identified for middle level (scientist C to E level) and senior level (scientist F and G). Here, more emphasis is given to further develop a scientist's field of expertise by making him/her acquainted with the latest advancements in their respective field of specialization. A total of 48 national trainings have been recommended in this category. At least one training for every scientist is proposed in this HRD plan period. In many of the proposed trainings, the number of participants is less and hence it may not be possible to organize trainings exclusively for such topics. It is therefore proposed that in such cases, efforts will be made to accommodate them in the trainings organized by the institute along with participants from other organizations. It is also proposed that the interested participants may be deputed for attachment with the institute where such regular trainings on the subject are not organized by the institute. A few sessions in these trainings may also be arranged through video conferencing with the experts in other institutes/organization wherever possible.

Training Programme Proposed for Scientists:

S. No.	Subject/ Area of Training	Training Organizations (Suggested/Tentative)	Duration (in days)	No. of Scientist to be Trained
A. Instrumentation, Nanotechnology and Bioprospecting				
1.	Instrumentation (Data Analysis and Interpretation- LCMS & NMR)	<ul style="list-style-type: none"> • National Chemical Laboratory, Pune • Indian Institute of Technology, Roorkee • Central Institute of Medicinal & Aromatic Plants, Lucknow • Central Drug Research Institute, Lucknow, • Indian Institute of Chemical Technology, Hyderabad • National Botanical Research Institute, Lucknow • Industrial Toxicology Research Centre, Lucknow 	5	10
2.	Production, processing and quality control of Ayurvedic medicine	<ul style="list-style-type: none"> • Minor Forest Produce Processing & Research Centre, Bhopal • National Institute of Integrated Medicine, Jammu • Central Council for Research in Ayurvedic Sciences • Oushadhi, Kerala 	3	6
3.	Instrumental Drug Discovery	<ul style="list-style-type: none"> • Central Drug Research Institute, Lucknow, • Indian Institute of Chemical Technology, Hyderabad • National Institute of Integrated Medicine, Jammu 	5	5



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4.	Nanotechnology-production, estimation and characterization of nano particles	<ul style="list-style-type: none"> • Indian Institute of Chemical Technology, Hyderabad • Indian Institute of Science, Bengaluru. • Indian Institute of Technology, Roorkee. • Tamil Nadu Agriculture University, Coimbatore 	5	5
5.	Basics of AAS, ICPMS, handling, data recording and interpretation	<ul style="list-style-type: none"> • National Physical Laboratory, New Delhi • National Chemical Laboratory, Pune • National Institute of Pharmaceutical Education and Research, Mohali 	5	10
B. Ecology, Climate Change and Environmental Management				
6.	Dendro climatology using tree ring analysis	<ul style="list-style-type: none"> • Indian Institute of Tropical Meteorology, Pune 	5	2
7.	Forest Biometrics and Growth Modelling	<ul style="list-style-type: none"> • Indian Agricultural Statistical Research Institute, New Delhi • Indian Statistical Research Institute, New Delhi • National Academy for Statistical Administration, Noida 	5	15
8.	Climate change modelling with special reference to forest ecosystem	<ul style="list-style-type: none"> • Indian Institute of Science, Bengalure • School of Ecology, French Institute, Puducherry. • Indian Institute of Tropical Meteorology, Pune 	5	5
9.	Assessment of carbon sequestration of different ecosystem/ forests	<ul style="list-style-type: none"> • Indian Council of Forestry Research and Education, Dehradun • Forest Survey of India, Dehradun • Indian Institute of Remote Sensing, Dehradun 	5	10
10.	Valuation/ Quantification of ecosystem Services	<ul style="list-style-type: none"> • Indian Institute of Forest Management, Bhopal 	5	17
11.	Environmental Impact Assessment	<ul style="list-style-type: none"> • Centre for Science and Environment, New Delhi • Wildlife Institute of India, Dehradun • Indian Council of Forestry Research and Education, Dehradun 	5	10



12.	Molecular Taxonomy	<ul style="list-style-type: none"> National Bureau of Plant Genetic Resources, New Delhi Center for Cellular and Molecular Biology, Hyderabad 	5	10
13.	Ecological niche modeling	<ul style="list-style-type: none"> The Energy and Resources Institute, New Delhi Indian Institute of Science, Bengaluru 	5	6
14.	Eco- restoration of deserts and degraded areas	<ul style="list-style-type: none"> Central Arid Zone Research Institute, Jodhpur/ Arid Forest Research Institute, Jodhpur Indian School of Mines, Dhanbad 	5	6
15.	Biodiversity assessment, conservation and development	<ul style="list-style-type: none"> Centre for Ecological sciences, Indian Institute of Sciences, Bengalure, Wildlife Institute of India, Dehradun School of Ecology, French Institute, Puduchery 	5	10
16.	Herbarium techniques and digital data base preparation	<ul style="list-style-type: none"> Department of Botany, Institute of Science, Mumbai Indian Council of Agricultural Research, New Delhi Forest Research Institute, Dehradun 	5	6
17.	Invasive Weed Management	<ul style="list-style-type: none"> Kerala Forest Research Institute, Peechi Directorate of Weed Research, Jabalpur 	5	6
C. Extension, Agroforestry and Socio-economics				
18.	Extension strategies in forestry sector	<ul style="list-style-type: none"> Indian Institute of Forest Management, Bhopal Indian Grassland and Fodder Research Institute, Jhansi Institute of Rural Management, Anand , Gujarat 	5	10
19.	Agroforestry and land use management	<ul style="list-style-type: none"> National Agroforestry Research Institute, Jhansi 	5	6
20.	Food safety & quality control	<ul style="list-style-type: none"> Central Food Technological Research Institute, Mysuru 	3	3
D. Forest and Environmental Law				
21.	Forest Policy, Laws and Environmental Law	<ul style="list-style-type: none"> National Law Universities Kerala Forest Research Institute Peechi, Jawaharlal Nehru University, New Delhi. 	5	3



E. Forest Protection and Biofertilizers				
22.	Integrated Pest Management including Biological control of forest insect-pests	<ul style="list-style-type: none"> National Bureau of Agriculturally important Insects, Bangalore Centre for Cellular & Molecular Biology, Hyderabad, Andhra Pradesh 	5	12
23.	Basic techniques of pesticide formulations	<ul style="list-style-type: none"> Institute of Pesticide formulation Technology, Gurugram, Haryana. 	5	2
24.	Pheromone technology	<ul style="list-style-type: none"> Indian Institute of Chemical Technology, Hyderabad Indian Agricultural Research Institute, New Delhi 	3	2
25.	Identification and characterization of micro-organisms	<ul style="list-style-type: none"> Institute of Microbial Technology, Chandigarh National Fungal Culture Collection of India, Agharkar Institute, Pune Department of Microbiology, IARI, New Delhi Department of Biotechnology, The Energy and Resources Institute, New Delhi. 	5	6
26.	Advanced molecular techniques in pathogenic and beneficial microbes[Gene sequencing, MALDI-TOF, FAME]	<ul style="list-style-type: none"> Department of Microbiology, IARI, New Delhi Department of Biotechnology, The Energy and Resources Institute, New Delhi. National Bureau of Agriculturally Important Microorganisms, Mau, UP National Bureau of Plant Genetic Resources, New Delhi Centre for Cellular and Molecular Biology, Hyderabad National Fungal Culture Collection of India, Agharkar Institute, Pune 	5	12
27.	Application of Bio-Char and Nano-fertilizer for Quality Planting Stock	<ul style="list-style-type: none"> Indian Institute of Science, Bengaluru Indian Institute of Soil Science, Bhopal Central Arid Zone Research Institute, Jodhpur Tamil Nadu Agricultural University, Coimbatore 	3	5
28.	Insect Taxonomy	<ul style="list-style-type: none"> Indian Agricultural Research Institute, New Delhi National Bureau of Agricultural Insect Resources, Bengaluru 	3	5



F. Forest Genetics and Tree Breeding				
29.	Forest Genetics Resource Management and Conservation	<ul style="list-style-type: none"> National Bureau of Plant Genetics Resources, New Delhi 	5	9
30.	Introductory training in molecular biology techniques	<ul style="list-style-type: none"> Institute of Forest Genetics and Tree Breeding, Coimbatore Indian Agricultural research Institute, New Delhi 	5	20
31.	Advance training in molecular biology techniques	<ul style="list-style-type: none"> Microbial Culture Collection, Pune National Bureau of Plant Genetics Resources, New Delhi Centre for Cellular and Molecular Biology, Hyderabad National Fungal Culture Collection of India, Agharkar Institute, Pune 	5	12
32.	Inducing stress in trees for flowering and heartwood induction	<ul style="list-style-type: none"> Institute of Forest Genetics and Tree Breeding, Coimbatore International Crops Research Institute for Semi-Arid Tropics, Hyderabad 	3	5
G. Forest Products				
33.	Wood seasoning, preservation and composite wood	<ul style="list-style-type: none"> Indian Plywood Industries Research and Training Institute, Bengaluru Institute of Wood Science and Technology, Bengaluru 	5	5
H. Forest Resource Management				
34.	Forest Certification	<ul style="list-style-type: none"> Forest Research Institute, Dehradun Indian Institute of Forest Management, Bhopal 	5	6
35.	Economics, value addition & marketing of forest produce	<ul style="list-style-type: none"> ICFRE Institutes. Indian Institute of Forest Management, Bhopal 	5	6
36.	Natural processing of Gums and Resins	<ul style="list-style-type: none"> Indian Institute of Natural Resins and Gums, Namkum, Ranchi 	5	3



I. Forest Statistics				
37.	Refresher training in statistical methods in forestry research	<ul style="list-style-type: none"> • Indian Council of Forestry Research and Education, Dehradun • Indian Agricultural Statistical Research Institute, New Delhi 	5	50
38.	Advanced statistical methods (using 'R' etc.)	<ul style="list-style-type: none"> • Indian Council of Forestry Research and Education, Dehradun • Indian Agricultural Statistics Research Institute, New Delhi 	5	9
J. Hydrology				
39.	Soil Water Assessment Tool (SWAT)	<ul style="list-style-type: none"> • Indian Institute of Technology, Madras • Indian Institute of Technology, Roorkee • National Institute of Hydrology, Roorkee 	5	2
40.	Hydrological Modelling, Artificial groundwater recharge & aquifer management	<ul style="list-style-type: none"> • National Institute of Hydrology, Roorkee and its centres 	5	2
K. Information Technology and Computer Science				
41.	SWDES/ HYMOS Software	<ul style="list-style-type: none"> • National Institute of Hydrography, Regional Center, Goa 	5	5
42.	a) STQC Certified Information Security Professional –ISO 27001 implementation Information Security Management system Lead Auditor as per ISO 27001 (NABET Accredited)	<ul style="list-style-type: none"> • Indian Institute of Quality Management, Jaipur • STQC Dte, Department of Information Technology, New Delhi 	5	5
43.	Bioinformatics & computational biology	<ul style="list-style-type: none"> • Institute of Bioinformatics and Applied Biotechnology, Bengaluru 	5	5
44.	Cyber security Training	<ul style="list-style-type: none"> • Indian Computer Emergency Response Team (CERT-In) Department of Information Technology, New Delhi 	5	5



45.	Certified Data Centre Professional	<ul style="list-style-type: none"> EPI India, Gurugram, Haryana 	5	2
L. Personnel Management				
46.	Research methodology, research writing and research management	<ul style="list-style-type: none"> National Academy of Agricultural Research, Hyderabad Indian Agricultural Statistics Research Institute, New Delhi 	5	20
M. Remote Sensing and GIS				
47.	Introduction to Remote Sensing and GIS	<ul style="list-style-type: none"> Indian Institute of remote Sensing, Dehradun Forest Survey of India, Dehradun Forest Research Institute, Dehradun 	5	30
48.	Advanced training in remote sensing & GIS (Hyper Spectral Remote Sensing, vegetation analysis, GIS in water resources, other application in forestry etc.)	<ul style="list-style-type: none"> Indian Institute of Remote Sensing, Dehradun National Remote Sensing Center, Hyderabad Forest Survey of India, Dehradun 	12	5
N. Soil Science				
49.	New analytical methods in soil research	<ul style="list-style-type: none"> Indian Council of Agricultural Research, New Delhi. Department of Soil Science, Punjab Agriculture University, Ludhiana. 	5	5

2.4 COST ESTIMATE:

1.	Three Days Training Program	: 31 Scientists x Rs 65,000	= Rs. 20,15,000
2.	One Week Training program	: 379 Scientists x Rs 81,000	= Rs. 3,06,99,000
3.	Two Week Training program	: 5 Scientists x Rs 1,02,000	= Rs. 5,10,000

TOTAL = Rs 3,32,24,000

The cost estimates include the course fees, travel, boarding & lodging and other miscellaneous expenditure on tentative basis.



2.5 SCHEDULE OF TRAININGS FOR SCIENTISTS

The schedule for trainings of the scientists in each quarter is given below. These will, however, be subject to the confirmation by the training institutes.

Schedule of Trainings for Scientists (Figures in parenthesis indicate the number of scientists)						
Year/ quarter	Type of Trainings	Apr. - June	July - Sept.	Oct. - Dec	Jan - March	No of Scientists
2018-19	Trainings in subjects exclusively for ICFRE scientists	1. Statistical methods in forestry research (10)	1. Advanced molecular techniques in pathogenic and beneficial microbes (12)	1. .Extension strategies in forestry sector (10)	1. Valuation / Quantification of ecosystem services (17)	76
	Other subjects	1. Insect taxonomy (5) 2. Eco- restoration of deserts and degraded areas (6) 3. Production, processing and quality control of ayurvedic medicine (6) 4. Hydrological modelling , artificial groundwater recharge & aquifer management (2) 5. Certified data centre (2) 6. Economics, value addition & marketing of forest produce (6)				
2019-20	Trainings in subjects exclusively for ICFRE scientists	1. Statistical methods in forestry research (10)	1. Introduction to Remote Sensing and GIS (15) 2. Forest genetics resource management & conservation (9)	1. Molecular taxonomy (10) 2.Forest biometrics and growth modeling (15)	1.Environmental Impact Assessment (10)	96
	Other subjects	1. Nanotechnology - production, estimation and characterization of nano particles (5) 2. Herbarium techniques and digital data base preparation (6) 3. Agroforestry and land use management (6) 4. Basic techniques of pesticide formulations (2) 5. Inducing stress in trees for flowering and heartwood induction (5) 6. Natural processing of gums and resins (3)				



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2020-21	Trainings on subjects exclusively for ICFRE scientists	1. Statistical methods in forestry research (10)	1. Introductory training in molecular biology techniques (20) Integrated pest management (12),	1. Research methodology, research writing and research management (10)	1. Assessment of carbon sequestration of different eco-system / forests (10)	84
	Other subjects	1. Food safety & quality control (3) 2. Pheromone technology (2) 3. Wood seasoning, preservation and composite wood (5) 4. Soil Water Assessment Tool (SWAT) (2) 5. Advance training in remote sensing & GIS (Hyper Spectral Remote Sensing, vegetation analysis, GIS in water resources, application in forestry etc., (5), 6. SWDES/ HYMOS software (5)				
2021-22	Trainings on subjects exclusively for ICFRE scientists	1. Statistical methods in forestry research (10)	1. Introduction to Remote Sensing and GIS (15)	1. Advance training in molecular biology techniques (12)	1. Biodiversity assessment, conservation and development (10)	80
	Other subjects	1. Dendro climatology using tree ring analysis (2) 2. Ecological niche modeling (6) 3. Forest policy, laws, environmental law (3) 4. Identification and characterization of micro-organism (6) 5. Forest Certification (6) 6. Bioinformatics & computational biology (5) 7. Application of bio-char and nano-fertilizer for quality planting stock (5)				
2022-23	Trainings on subjects exclusively for ICFRE scientists	1. Statistical methods in forestry research (10)	1. Instrumentation (Data Analysis and Interpretation- LCMS & NMR) (10)	1. Research methodology, research writing and research management(10)	1. Advanced statistical methods (using 'R' etc.) (9)	69



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	<ol style="list-style-type: none">1. Climate change modelling with special reference to forest ecosystem (5)2. Invasive weed management (5)3. Cyber security training (5)4. New analytical methods in soil research (5)5. STQC Certified Information Security Professional –ISO 27001 implementation & information security management system lead auditor as per ISO 27001 (NABET Accredited) (5)6. Instrumental drug discovery (5)	
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CAPACITY BUILDING OF TECHNICAL STAFF

CHAPTER 3

CAPACITY BUILDING OF TECHNICAL STAFF

3.1 CAPACITY BUILDING OF TECHNICAL STAFF

The Technical (research support) staff in ICFRE are appointed by direct recruitment at the following three levels as per the Technical Service Rules

- (i) Technician
- (ii) Technical Assistant
- (iii) Senior Technical Officer

This research support staff are required to be trained not only in research activities and methods, but also in office procedures and administration. Induction trainings for personnel appointed through direct recruitment are required in order to acquaint them with administration, operational and professional culture of the council. Apart from the induction training, regular advanced professional skill upgradation trainings are required during the course of their career for improving their skills and keep them updated with the latest developments in their field. At the level of technicians, the eligibility prescribed for the recruitment of candidates is ITI certificate or a certificate course from a Government recognized institute. Hence, the induction training for technicians is proposed to be shorter focusing primarily on administrative aspects. However, exposure training on instrumentation in the institute as well in other organizations will also be organized during this period. Separate modules are proposed for different categories of technical staff. The period and modules of induction training for different categories are given below:

3.2 INDICATIVE COURSE DESIGN FOR INDUCTION TRAINING OF TECHNICAL STAFF

Induction Training for Technicians

Subject : Overview of ICFRE, administration, office procedures and computer applications

Duration : One week

1. Overview of ICFRE and Institutes, HRD and personnel management, effective communication & presentation skills for personality development, career progression and planning.
2. Handling office correspondences, file management, record keeping, preparation of notes & drafts, manual of office procedures, service & establishment rules, accounting procedures, procurement procedures and rules, ACR/APARs,



public services doctrine and conduct, right to information.

3. Computer applications and use of office equipments.
4. Instrumentation (Institute and other organizations)

Induction Training for Technical Assistants (Field/Lab Research)

Subject : Overview of forestry and ICFRE, administration, office procedures and computer applications, sampling techniques, research methodology, instrumentation

Duration : Two weeks

Week I

1. Forest administration in India, structure and functions of various forestry organizations, overview of forestry in India, overview of ICFRE and its institutes, research, extension and education, HRD and personnel management, effective communication, , presentation, skills for personality development, career progression and planning.
2. Handling office correspondences, file management, record keeping, preparation of notes & drafts, manual of office procedures, service and establishment rules, accounting procedures, procurement procedures and rules, ACR/APARs, public services doctrine and conduct, right to information and other aspects.
3. Computer applications, use and maintenance of office equipments.

Week II

4. Sustainable forest management, forest types, important species, forest working plans, forest protection, non timber forest products, forest ecology and biodiversity conservation, soil and water conservation approaches, wildlife management, extension forestry and agro forestry.
5. Observations, data and their measurement scales, frequency distributions, central tendency, dispersion, presentation of data, Probability and its applications in data analysis, binomial, normal and other distribution functions,
6. Designing lab and field experiments in forestry – CRD, RBD, LSD, designs for optimization, alpha-designs, planning sample surveys: development of questionnaires and data collection forms, sampling techniques commonly used in forestry.
7. Instrumentation training: basics, handling, standardization and data recording

Induction Training for Technical Assistants (Maintenance/Workshop/General Services/ Paramedical)

Subject : Overview of forestry and ICFRE, administration, office procedures and computer applications, and on the job training in respective division/establishment

Duration : Two weeks



Week I

1. Forest administration in India, structure and functions of various forestry organizations, overview of forestry in India, overview of ICFRE and its institutes, research, extension and education, HRD and personnel management, effective communication and presentation, skills for personality development, career progression and planning.
2. Handling office correspondences, file management, record keeping, preparation of notes & drafts, manual of office procedures, service and establishment rules, accounting procedures, procurement procedures and rules, ACR/APARs, public services doctrine and conduct, right to information.
3. Computer applications, use and maintenance of office equipments.

Week II

On the job training in respective divisions/establishments

Induction Training for Senior Technical Officers (Field/Lab Research)

Subject : Overview of forestry and ICFRE, administration, office procedures, computer applications & GIS, applied statistics, experimental designs, research proposals

Duration : Two weeks

Week I & II

1. Overview of ICFRE and its institutes, research, extension and education, forest administration in India, overview of forestry in India, challenges & opportunities, forest policies and legislation (important acts), overview of forestry programmes (JFM, GIM, NAP etc.), forestry organizations (International and National), visit to other institutes such as FSI, WII, etc.
2. Computer applications, GIS application in forestry, handling of GPS in surveys and data collection, working with GPS data in surveys, plotting GPS data for locations, sampling, trails etc, visit to FSI/IIRS
3. Sustainable forest management, forest types, important species, forest working plans, forest protection, Non timber forest products, forest ecology and biodiversity conservation, soil and water conservation approaches, wildlife management, extension forestry and agro-forestry.
4. Observations, data and their measurement scales, frequency distributions, central tendency, dispersion, presentation of data, probability and its applications in data analysis, binomial, normal and other distributions.
5. Designing lab and field experiments in forestry – CRD, RBD, LSD, designs for optimization, alpha-designs, planning sample surveys: development of questionnaires and data collection forms, sampling techniques commonly used in forestry.



6. Developing research proposals, scientific values and professional ethics in research proposal writing, skills for scientific research paper/report writing, preparation of concept papers and technical notes, project management techniques, funding agencies and approach, periodical reporting.
7. Instrumentation training: basics, handling and data recording

Induction Training for Senior Technical Officer (Maintenance/workshop/general services/paramedical)

Subject : Overview of forestry and ICFRE, administration, office procedures and computer applications, and on the job training in respective division/establishment

Duration : Two weeks

Week I & II

1. Overview of ICFRE and institutes, research, extension and education, forest administration in India, overview of forestry in India, challenges & opportunities, forest policies and legislation (important acts), overview of forestry programmes (JFM,GIM,NAP etc.), forestry organizations (International and National), visit to other Institutes such as FSI, WII etc.
2. Handling office correspondences, file management, record keeping, preparation of notes & drafts, manual of office procedures, service and establishment rules, accounting procedures, procurement procedures and rules, ACR/APARs, public services doctrine and conduct, right to information.
3. Computer applications and use of GIS
4. On the Job training including laboratory maintenance and instrumentation handling

The induction courses for the technicians and technical assistants will be organized by the respective institutes while the induction training for the senior technical officers will be organized centrally at FRI Deemed to be University. Lectures discussion may also be organized through video conferencing with experts of other institutes/organization, wherever possible.

3.3 PROFESSIONAL SKILL UPGRADATION TRAINING

Apart from the induction training, 43 training courses have been proposed for the technical staff. The technical staff is required to be well versed with laboratory procedures, analysis, equipment, glassware and chemical handling, field data collection, experimental designing and knowledge of statistical tools. Trainings will be organized exclusively for ICFRE staff where sufficient numbers are proposed to be trained. In cases where numbers of staff are less than the required group size, for a particular training, they will be nominated and trained along with participants from other organizations. As in the case of scientists, it is also proposed to depute the staff on attachment with the institute, where such regular trainings on the



subject are not organized by the institute. The possibility of organizing trainings in the ICFRE institutes by inviting faculty from reputed institutions will also be explored. A few sessions during the trainings may also be arranged through video conferencing, wherever possible. The institutions/organizations where the training courses shall be organized are given against each course as below:

S. No.	Subject/ Area of Training	Training Organisations (Suggested/ Tentative)	Total duration (in days)	Tentative number of technical staff
A. Agro-forestry and extension				
1.	New approaches in agro-forestry and tree- crop interaction	<ul style="list-style-type: none"> • National Agroforestry Research Institute, Jhansi. • University of Horticulture and Forestry, Nauni, Solan. • Indian Grassland and Fodder Research Institute, Jhansi • Punjab Agriculture University, Ludhiana • Tamilnadu Agriculture University, Coimbatore 	5	10
2.	Cultivation, processing techniques & management of non-wood forest products including medicinal plants and wood fuel	<ul style="list-style-type: none"> • Central Food Technological Research Institute, Mysore • Indian Institute of Forest Management, Bhopal • Central institute of Medicinal and Aromatic Plants, Lucknow 	5	10
3.	Market mechanism of Farm Forestry/ Agro-forestry Products and Services	<ul style="list-style-type: none"> • Indian Institute of Forest Management, Bhopal 	5	10
4.	Extension strategies in Forestry Sector	<ul style="list-style-type: none"> • Indian Institute of Forest Management, Bhopal • Indian Grassland and Fodder Research Institute, Jhansi • Institute of Rural Management, Anand , Gujarat 	5	10
B. Computer science and information technology				
5.	Computer and internet applications	<ul style="list-style-type: none"> • ICFRE Institutes 	5	30



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6.	Library Information System	• National Institute of Science Communication and Information Resources, New Delhi	3	15
7.	Digital Library/Repository/R FID Technology	• National Institute of Science Communication and Information Resources, New Delhi	5	5
8.	Content Management Software	• National Institute of Science Communication and Information Resources, New Delhi	5	5
9.	Networking and Hardware Maintenance	• Indian Institute of hardware Technology Ltd., Vishakhapatnam, Andhra Pradesh	5	15
10.	Training Course on SWDES/HYMOS Software	• National Institute of Hydrography, Goa	5	5
C. Ecology & climate change				
11.	Herbarium techniques and digital database preparation	• Forest Research Institute, Dehradun • The Energy and Resources Institute, New Delhi • Indian Institute of Science, Bengaluru • Botanical Survey of India, Dehradun	5	10
12.	Plant taxonomy and economic botany	• Botanical Survey of India, Dehradun • Forest Research Institute, Dehradun	5	9
13.	Climate Change, Carbon Sequestration and Mitigation	• Indian Council of Forestry Research and Education (HQ)	5	10
D. Forest genetics and biotechnology				
14.	Basic techniques in plant molecular biology	• Forest Research Institute, Dehradun • Institute of Forest Genetics and Tree Breeding, Coimbatore • Centre for Cellular and Molecular Biology, Hyderabad • National Bureau of Plant Genetic Resources, New Delhi	5	15



15.	Tissue culture of trees and bamboos	<ul style="list-style-type: none"> • Forest Research Institute, Dehradun • Arid Forest Research Institute , Jodhpur • Institute of Forest Genetics and Tree Breeding, Coimbatore 	5	8
16.	Experimentation and data management in tree Improvement	<ul style="list-style-type: none"> • Forest Research Institute, Dehradun • Institute of Forest Genetics and Tree Breeding, Coimbatore 	5	10
17.	Plus tree selection	<ul style="list-style-type: none"> • Institute of Forest Genetics and Tree Breeding, Coimbatore • Kerala Forest Research Institute, Peechi 	3	10
18.	Germplasm collection and conservation	<ul style="list-style-type: none"> • Institute of Forest Genetics and Tree Breeding, Coimbatore 	3	10
E. Forest protection & beneficial microbes				
20.	Insect pest collection, handling, preservation and biological control	<ul style="list-style-type: none"> • Indian Agricultural Research Institute, New Delhi • Punjab Agricultural University, Ludhiana • DBS, Bengaluru • Assam Agricultural University, Jorhat • National Bureau of Agricultural Insect Resources, Bengaluru 	3	6
21.	Edible and medicinal mushroom cultivation	<ul style="list-style-type: none"> • Forest Research Institute, Dehradun 	3	9
F. Forest resource management				
22.	Economic Valuation of forests	<ul style="list-style-type: none"> • Indian Institute of Forest Management, Bhopal 	3	6
23.	NTFP value addition and assessment	<ul style="list-style-type: none"> • Indian Institute of Biosocial Research and Development, Kolkata • Central institute of Medicinal and Aromatic Plants, Lucknow • Indian Institute of Forest Management, Bhopal • Institute of Himalayan Bioresource Technology, Palampur 	5	5
24.	Food Safety & quality control	<ul style="list-style-type: none"> • Central Food Technological Research Institute, Mysuru 	3	2



E. Forest statistics				
25.	Research Methodology and Statistical tools in forestry	<ul style="list-style-type: none"> Indian Council of Forestry Research and Education, Dehradun Indian Agricultural Statistical Research Institute, New Delhi 	5	50
26.	Field survey, data collection, compilation and analysis	<ul style="list-style-type: none"> Indian Council of Forestry Research and Education, Dehradun Indian Agricultural Statistical Research Institute, New Delhi 	5	40
G. General forestry, silviculture and seed technology				
27.	General forestry	<ul style="list-style-type: none"> Forest Research Institute or any other ICFRE Institute 	5	25
28.	Nursery development and vegetative propagation	<ul style="list-style-type: none"> Minor Forest Produce Processing & Research Centre, Bhopal Indian Institute of Horticultural Research, Bengaluru Horticulture Department, Indian Agricultural Research Institute, New Delhi 	5	10
29.	Seed Technology	<ul style="list-style-type: none"> Indian Agricultural Research Institute, New Delhi University of Agricultural Sciences, Dharwad 	5	10
30.	Composting techniques	<ul style="list-style-type: none"> Indian Agricultural Research Institute, New Delhi 	5	10
31.	Eco- restoration of deserts and degraded areas	<ul style="list-style-type: none"> Central Soil Salinity Research Institute, Karnal Central Arid Zone Research Institute, Jodhpur Arid Forest Research Institute, Jodhpur Himalayn Forest Research Institute, Shimla 	5	20
H. Hydrology				
32.	An Introduction to field hydrology/ Artificial groundwater recharge & aquifer management	<ul style="list-style-type: none"> National Institute of Hydrology, Roorkee, and its regional centres. Ashoka Trust for Research in Ecology and Environment, Bengaluru 	5	2
J. Instrumentation & analytical chemistry				
33.	Laboratory instruments: handling and maintenance	<ul style="list-style-type: none"> Indian Institute of Technology, Roorkee Central Institute of Medicinal and Aromatic Plants, Lucknow 	5	20



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34.	Instrumentation (GC-MS , HPLC, spectrophotometers, etc.,)	<ul style="list-style-type: none"> • Central Drug Research Institute, Lucknow • Indian Institute of Petroleum, Dehradun • Indian Institute of Technology, Roorkee 	5	15
35.	Analytical chemistry of NWFPs & medicinal plants	<ul style="list-style-type: none"> • Central Institute of Medicinal & Aromatic Plants, Lucknow 	5	6
36.	Processing and analysis of gums, honey and resins	<ul style="list-style-type: none"> • Indian Institute of Natural Resins and Gums, Namkum, Ranchi • Minor Forest Produce Processing & Research Centre, Bhopal 	3	4
K. Remote sensing and GIS				
37.	Introduction to remote sensing, GIS & their applications in forestry research	<ul style="list-style-type: none"> • Forest Survey of India, Dehradun • Forest Research Institute, Dehradun • Indian Institute of Remote Sensing , Dehradun 	5	10
38.	Use of GPS	<ul style="list-style-type: none"> • Forest Informatics Division, Forest Research Institute, Dehradun 	3	10
L. Soil science				
39.	Advance techniques in soil, plant and water analysis	<ul style="list-style-type: none"> • Indian Institute of Soil and Water Conservation, Dehradun • Indian Council of Agricultural Research, New Delhi • Forest Research Institute, Dehradun • Tamil Nadu Agricultural University, Coimbatore 	5	10
40.	Soil Survey	<ul style="list-style-type: none"> • Central Training Institute, Burnihat, Gauhati, Assam • Indian Institute of Soil and Water Conservation, Dehradun 	3	10

3.4 COST ESTIMATE :

1.	Three Days Training Program	92 nos.x Rs.33,000	=	Rs. 30,36,000
2.	One week Training program:	385 nos. x Rs. 45,000	=	Rs.1,73,25,000
TOTAL			=	Rs. 2,03,61,000

The cost estimates include the course fees, travel, boarding & lodging and other miscellaneous expenditure on tentative basis.



HUMAN RESOURCE DEVELOPMENT PLAN (2018 – 23)

3.5 SCHEDULE OF TRAININGS FOR TECHNICAL STAFF

The schedule for trainings of the Technical Staff in each quarter is given below. These will however be subject to the confirmation by the training institutes.

Schedule of trainings for technical staff (Figures in parenthesis indicate the number of technical staff)						
Year/quarter	Apr - June	July - Sept	Oct - Dec	Jan - March	Trainings not exclusive for ICFRE	No of Technical Staff
2018-19	1. Research methodology and statistical tools in forestry (15)	1. Plant taxonomy and economic botany (9) 2. Eco-restoration of deserts and degraded areas (20)	1. Basic techniques in plant molecular biology (15) 2. Extension strategies in forestry sector (10)	1. New approaches in agro-forestry and tree-crop interaction (10).	1. Digital Library/Repository/RFID Technology (5) 2. An Introduction to field hydrology, Artificial groundwater recharge & aquifer management (2)	86
2019-20	1. Research methodology and statistical tools in forestry (15)	1. Herbarium techniques and digital database preparation (10) 2. Library Information System (15)	1. Tissue culture of Trees and bamboos (8) 2. Field survey, data collection, compilation and analysis (20)	1. Introduction to remote sensing, GIS & their applications in forestry research (10)	1. SWDES/HYMOS Software (5) 2. Insect pest collection handling, preservation and biological control (6) 3. NTFP value addition and assessment (5)	94
2020-21	1. Composting techniques (10)	1. Soil Survey (10) 2. Networking and	1. Experimentation & data management	1. Research methodology	1. Processing and analysis of honey,	101



		hardware Maintenance (15)	in tree improvement (10) 2. Market mechanism of farm forestry/agro-forestry products and services (10)	and statistical tools in forestry (20) 2. Laboratory instruments: handling and maintenance (20)	gums and resins (4) 2. Food Safety & quality control (2)	
2021-22	1. Computer and Internet applications (15).	1. Edible and medicinal mushroom cultivation (9) 2. Nursery development and vegetative propagation (10)	1. Plus tree selection (10) 2. Field survey, data collection, compilation and analysis (20)	1. Use of GPS (10) 2. Cultivation, processing techniques & management of non-wood forest products including medicinal plants (10)	1. Analytical chemistry of NWFPs and medicinal plants (6) 2. Economic valuation of forests (6)	96
2022-23	1. Climate change, carbon sequestration and mitigation (10)	1. Instrumentation (GC-MS and HPLC) (15) 2. General forestry (25)	1. Germplasm Collection and Conservation (10) 2. Computer and internet applications (15).	1. Advance techniques in soil, plant and water analysis (10) 2. Seed technology (10)	1. Content management software (5)	100







**CAPACITY
BUILDING OF
ADMINISTRATIVE
STAFF**

CHAPTER 4

CAPACITY BUILDING OF ADMINISTRATIVE STAFF

4.1 CAPACITY BUILDING FOR ADMINISTRATIVE STAFF

Trainings for the administrative staff have been included for the first time in the HRD plan of ICFRE and its Institutes. These trainings will include induction training on direct recruitment as well as subsequent skill upgradation trainings. Training requirements concerning the recently implemented and adopted office procedures, accounts, right to information, financial accounting system, ethics & values in public governance/good governance, gender sensitization, e-procurement etc. have been considered and accordingly incorporated in the training programme for a better understanding of rules and an improved & positive work environment.

4.2 INDUCTION TRAINING

Induction Training for Administrative Staff

Subject : Overview of forestry and ICFRE, administration, office procedures and computer applications

Duration : Two Weeks

1. Overview of ICFRE and Institutes, forest administration in India, HRD and personnel management skills, personality development, career progression and planning.
2. Handling office correspondences, file management
3. Noting & drafting, preparation of notes & drafts
4. Manual of office procedures, service and establishment rules
5. Accounting procedures, audit, procurement procedures and rules,
6. ACR/APARs
7. Public services doctrine and conduct
8. Store keeping and record maintenance
9. Vigilance and disciplinary proceedings
10. Sexual harassment at work place and gender sensitization,
11. Right to information.
12. Computer applications and use of office equipments.



4.3 SKILL UPGRADATION TRAININGS:

A total of nine training programmes have been identified for the administrative staff. Though broad topics/subjects are proposed as below, emphasis will be given to the latest developments in the subjects and these will be either adequately incorporated in the training schedule or exclusive trainings will be organized in these latest developments. In subjects like catering and housekeeping, the contractual staff engaged may also be included in the training along with the regular staff for certain sessions as required. These trainings will be mostly organized in the ICFRE institutes and resource persons may be invited from the Institutions suggested/other organisations. Considering administrative convenience, staff from nearby institutions will only be nominated for these trainings. A few sessions may also be arranged through video conferencing. The training programmes and institutions identified for the skill upgradation trainings of the administrative staff are given below:

S. No	Subject/ Area of training	Training Institution (Suggested/ Tentative)	Duration (days)	Total Number of Trainees	Schedule
1.	Administrative vigilance and disciplinary procedures	<ul style="list-style-type: none"> • Institute of Secretariat Training and Management, New Delhi • Institute of Wood Science and Technology, Bengaluru • Forest Research Institute, Dehradun 	3	50	1. Quarter IV of 2018-19 2. Quarter IV of 2022-23
2.	Administrative vigilance and disciplinary procedures	<ul style="list-style-type: none"> • Institute of Secretariat Training and Management, New Delhi • Indian Institute of Public Administration, New Delhi • Tropical Forest Research Institute, Jablpur • Arid Forest Research Institute, Jodhpur 	3	50	1. Quarter II of 2018-19 2. Quarter II of 2022-23
3.	E-Procurement & purchase management in Government, Storekeeping and record maintenance	<ul style="list-style-type: none"> • Institute of Secretariat Training and Management, New Delhi • Tropical Forest Research Institute, Jablpur • Institute of Forest Productivity, Ranchi • Himalayan Forest Research Institute, Shimla 	3	50	1. Quarter IV of 2020-21 2. Quarter III of 2022-23



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4.	Finance, budget and accounts ,Internal audits and control	<ul style="list-style-type: none"> • Institute of Secretariat Training and Management, New Delhi • Institute of Forest Genetics and Tree Breeding, Coimbatore • Himalayan Forest Research Institute, Shimla 	3	50	<ol style="list-style-type: none"> 1. Quarter II of 2019-20 2. Quarter II of 2021-22
5.	Office procedures, handling office correspondence, file management, noting & drafting, service and establishment rules, office equipment, etc	<ul style="list-style-type: none"> • Institute of Secretariat Training and Management, New Delhi • Forest Research Institute, Dehradun • Rain Forest Research Institute, Jorhat • Institute of Wood Science and Technology, Bengaluru 	3	75	<ol style="list-style-type: none"> 1. Quarter III of 2018-19 2. Quarter I of 2020-21 3. Quarter III of 2021-22
6.	Preliminary translation training	<ul style="list-style-type: none"> • CHTB, New Delhi/ Kolkata • Forest Research Institute, Dehradun 	3	15	<ol style="list-style-type: none"> 1. Quarter II of 2018-19 2. Quarter III of 2020-21
7.	Recruitment, roster writing and reservation in services, promotions, engagement of personnel, etc.,	<ul style="list-style-type: none"> • National Council for Training & Social Research, New Delhi • Arid Forest Research Institute • Institute of Forest Productivity, Ranchi 	3	25	<ol style="list-style-type: none"> 1. Quarter II of 2018-19 2. Quarter III of 2019-20
8.	Housekeeping and catering	<ul style="list-style-type: none"> • Any Institute/reputed Hotel • Forest Research Institute, Dehradun 	3	50	<ol style="list-style-type: none"> 1. Quarter IV of 2019-20 2. Quarter IV of 2021-22
9.	Computers applications	<ul style="list-style-type: none"> • Any reputed institute • Indian Council of Forestry Research and Education (HQ) 	3	50	<ol style="list-style-type: none"> 1. Quarter I of 2019-20 2. Quarter II of 2020-21

4.4 COST ESTIMATE:

1. Three Days Training Program 415 nos x Rs.20,000 = Rs 83,00,000

The cost estimates include the course fees, travel, boarding & lodging and other miscellaneous expenditure on tentative basis.



HUMAN RESOURCE DEVELOPMENT PLAN (2018 – 23)

4.5 SCHEDULE OF TRAININGS FOR ADMINISTRATIVE STAFF

Schedule of Trainings for Administrative Staff					
Year/quarter	I Quarter	II Quarter	III Quarter	IV Quarter	No of Administrative Staff
2018-19		Ethics & Value in Public governance/ Good governance/ Right to information/ Gender sensitization/ sexual harassment at work place (25)	Office procedures, noting & drafting, etc.,(25)	Administrative vigilance and disciplinary procedures (25)	75
2019-20	Computers applications (25)	Finance, budget and accounts ,internal audits and control (25)	Recruitment, roster writing and reservation in services, promotions, engagement of personnel (25)	House Keeping and catering (25)	100
2020-21	Office Procedures , Noting & drafting, etc.,(25)	Computers applications (25)	Preliminary translation training (15)	E-Procurement & purchase management in Government , storekeeping and record maintenance (25)	90
2021-22		Finance, budget and accounts, Internal audits and control (25)	Office procedures, Noting & drafting, etc.,(25)	Housekeeping and catering (25)	75
2022-23		Ethics & value in Public governance /good governance/ right to information / gender sensitization / sexual harassment at work place (25)	E-Procurement & purchase management in Government, Storekeeping and record maintenance (25)	Administrative vigilance and disciplinary procedures (25)	75

Note : The trainings may also be conducted in one or more batches in the same quarter. Figures in parenthesis indicate the number of participants.



INTERNATIONAL TRAININGS

CHAPTER 5

INTERNATIONAL TRAININGS

5.1 INTERNATIONAL TRAININGS

Thirty three international trainings for scientists/ officers/ senior technical officers have been proposed over the five year period of this HRD plan. Against one topic, more than one international institution/organization are suggested and the training may be organized in any one of the institutions/organizations. The subjects/topics and institutions are indicative and the exact topic for training/institution will be refined as per requirements. The international training programmes identified are given below:

S. No.	Training Topic/ Area	Training Organizations
A. BOTANY AND PLANT PHYSIOLOGY		
1.	Molecular taxonomy and phylogeny of angiosperms	<ul style="list-style-type: none">• Centre for International Forestry Research, Jawa Barat, Indonesia• Commonwealth Scientific and Industrial Research Organisation, Urrbrae, Australia• Forest Research Institute, Kuala Lumpur• Beijing Forestry University, China• Zhejiang Agriculture and Forestry University, China
B. CHEMISTRY OF FOREST PRODUCT		
2.	Medicinal plants and chemistry of Natural Products	<ul style="list-style-type: none">• Oregon State University, Corvallis, USA• Michigan State University, USA• National Centre for Natural Products Research, School of Pharmacy University of Mississippi, USA• Forest Product Laboratory, Wisconsin, USA• Max Planck Institute of Experimental Medicine, Göttingen, Germany
3.	Bio-fuels	<ul style="list-style-type: none">• Forest Product Laboratory, Madison, Wisconsin, USA
4.	Value addition of natural carbohydrate polymers	<ul style="list-style-type: none">• Whistler Center for Carbohydrate Research, Indiana, USA
5.	Functional nano materials and their applications	<ul style="list-style-type: none">• Monash University, Melbourne, Australia





6.	Methods and techniques of synthetic biology for production of novel F&F molecules	<ul style="list-style-type: none"> • Biotechnology and Biological Sciences Research Council, Swindon, UK
7.	Modern tools in characterization of Bioactive compounds	<ul style="list-style-type: none"> • University of Wisconsin, Madison, USA
C. ECOLOGY, ENVIRONMENT AND BIODIVERSITY		
8.	Economic Valuation of Ecosystem Services and Forests	<ul style="list-style-type: none"> • University of Ontario, Edmonton, Canada
9.	Effect of climate change, modeling and population dynamics	<ul style="list-style-type: none"> • Department of Forest Sciences, The University of British Columbia Vancouver, Canada • Faculty of Geo Information Science and Earth Observation, University of the Twente Enschede, Netherlands
10.	Climate change and desertification - processes, assessment and monitoring	<ul style="list-style-type: none"> • The Centre of International Postgraduate Training in Applied Meteorology, Bet Dagan, Israel
11.	Bamboo for landscape restoration	<ul style="list-style-type: none"> • International Network for Bamboo and Rattan, Beijing, China
12.	biochar properties, development and application	<ul style="list-style-type: none"> • Zhejiang Biochar Engineering Technology Research Centre, Hangzhou, China • Environmental Resource Soil and Fertilizer Institute, Hangzhou, China
13.	Understanding behaviour of GHGs and Energy of Wetland Ecosystem	<ul style="list-style-type: none"> • National Institute of Environmental Studies, Tsukuba, Japan
14.	Reclamation of Soil / Mine overburden	<ul style="list-style-type: none"> • Department of Forest Ecosystem Science, University of Melbourne, Australia • Commonwealth Scientific and industrial Research Organization, Canberra, Australia
15.	GIS and Geo-visualisation	<ul style="list-style-type: none"> • Faculty of Geo Information Science and Earth Observation of the University, Twente, Enschede, Netherlands



D. FOREST PRODUCTS		
16.	Applications of nondestructive testing methods for rapid assessment of wood quality parameters.	<ul style="list-style-type: none"> • Warnell School of Forestry and Natural Resources, University of Georgia, USA • Department of Forest Ecosystems and Society, Oregon State University, Corvallis • The Finnish Forest Research Institute, Finland • Scion Research Institute, Rotorua, New Zealand
17.	Wood composite and wood modification	<ul style="list-style-type: none"> • KTH Royal Institute of Technology, Stockholm, Sweden. • School of Graduate Studies, Faculty of Forestry, University of Toronto, Canada • Faculty of Forestry, Centre for Advanced Wood Processing, University of British Columbia, Vancouver, Canada • Faculty of Forestry, Geography and Geomatics, <i>Universite Laval</i>, Quebec, Canada • Forest Products Laboratory, Madison, USA
18.	NTFP resource development	<ul style="list-style-type: none"> • Non-Timber Forest Products Network of Canada, Royal Roads University, Canada • International Network for Bamboo and Rattan Beijing , China • World Agro Forestry Centre Nairobi, Kenya
19.	Silviscan for evaluation of wood quality	<ul style="list-style-type: none"> • Innventia AB, Drottning Kristinas, Stockholm, Sweden • Commonwealth Scientific and Industrial Research Organization, Canberra, Australia
E. GENETICS & BIOTECHNOLOGY		
20.	Planting stock improvement, tree breeding and forest genetic resource conservation	<ul style="list-style-type: none"> • University of Florida, Gainesville, USA • Johann Heinrich von Thunen, Institute, Federal Research Institute for Rural Areas, Forestry and Fisheries, Braunschweig, Germany • Royal Botanical Garden Kew, UK • Department of Forest Science and Genetics Texas, Texas • Buesgen Institute , Department of Forest Genetics and Tree Breeding, Gottingen, Germany





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21.	Next-Generation Sequencing (NGS) for tree species	<ul style="list-style-type: none"> • Genome Canada, Ottawa, Canada • Department of Forestry and Natural Resources, Purdue University, USA
22.	Conservation genetics / genetic engineering, genome mapping and sequencing	<ul style="list-style-type: none"> • Centre for Development Innovation Wageningen, Netherlands • Oregon State University, Corvallis, USA • University of Khyushu, Fukuoka, Japan • Institute of Forest Genetics, Braunschweig, Germany • National Center for Genetic Engineering Biotechnology (BIOTEC), Khlong Nung, Thailand
23.	Population genetics and gene expression analysis	<ul style="list-style-type: none"> • Buesgen Institute , Department of Forest Genetics and Forest Tree Breeding, Gottingen, Germany
F. NANO TECHNOLOGY		
24.	Nano-cellulose and bio-composites	<ul style="list-style-type: none"> • Wood and Bio Nano composites Composite Center, Lulea University of Technology, Sweden • Centre for Bio composites and Biomaterials Processing, University of Toronto, Canada
25.	Nanotechnology for surface protection/functionalized wood surfaces	<ul style="list-style-type: none"> • Applied Wood Materials, Swiss Federal Laboratories for Materials Science and Technology, Switzerland
26.	Development and use of bio-pesticides in forestry	<ul style="list-style-type: none"> • Natural Resources Institute, University of Greenwich, UK
27.	New techniques in insects taxonomy & pathological taxonomy	<ul style="list-style-type: none"> • Smithsonian Institution, Washington, USA • Faculty of Life Sciences, Imperial College, London
28.	Biochemistry of insect-plant interactions/neuro endocrinology	<ul style="list-style-type: none"> • Department of Entomology, NC State University, USA
29.	Molecular virology and entomology	<ul style="list-style-type: none"> • Natural Resources Institute ,University of Greenwich, UK
30.	Mycorrhizal/microbial interaction and biotechnology	<ul style="list-style-type: none"> • Forest Research Institute, Selangor, Malaysia • Korea Forest Research Institute, Seoul



G. FOREST PROTECTION/FOREST MANAGEMENT		
		<ul style="list-style-type: none"> • Department of Mycorrhizal Symbiosis, Institute of Botany, ASCR, Czech Republic. • Commonwealth Mycological Institute, Surrey, England • Department of Plant Microbe Interactions, Max-Planck Institute for Plant Breeding Research, Köln, Germany
31.	Bio-prospecting	<ul style="list-style-type: none"> • Natural Resource Ecology Laboratory, Colorado State University, USA • Geo-Information Science and Earth Observation, University of Twente, Netherlands • Malaysian Remote Sensing Agency, Kuala Lumpur, • Forest Research Institute, Selangor, Malaysia • Centre for International Forestry Research, Jawa Barat, Indonesia • Commonwealth Scientific and Industrial Research Organization, Urrbrae, Australia
32.	Silviculture, forest biometrics, forest inventory and remote sensing	<ul style="list-style-type: none"> • Burkhardt Institute, Department of forest inventory and remote sensing, Georg-August University, Gottingen, Germany • Department of Forest Resources and Environmental Conservation, Virginia Tech, USA • University of Santiago de Compostela, Lugo, Spain • Forest Research Centre, Southern Cross University, Australia • Swedish University of Agriculture Sciences, Faculty of Forest Science, Umea, Sweden • Faculty of Forestry, University of British Columbia, Vancouver, Canada
H. HYDROLOGY		
33.	Water / management budgeting in forest ecosystem	<ul style="list-style-type: none"> • Department of Biochemistry and Molecular Biology, Michigan State University , USA • Faculty of Agriculture, Food and Environment, Hebrew, University of Jerusalem

5.2 COST ESTIMATES

For the estimation of approximate expenditure in international trainings, the cost was calculated for an average of one week training period.

Total cost of 33 international training: 33 X Rs 3, 52, 300 (65 *5420 \$) = Rs 1,16,25,900





OTHER INITIATIVES

CHAPTER 6

OTHER INITIATIVES

The Council aims to develop a superior workforce and an ideal atmosphere so that the individual employees and the organization as a whole can effectively accomplish their mandate. To this end, apart from capacity building of personnel, a number of other measures are also sought to be instituted.

6.1 ICFRE AWARDS FOR EXCELLENCE

The council has instituted awards for excellence for scientists as well other personnel to motivate and to recognize their contribution in forestry research and administration. The following two categories of awards have been instituted to be given every year.

6.1.1 ICFRE Awards for Excellence in Forestry – These inter alia include awards for scientists serving in ICFRE (HQ) and its institutes/centres under following five-sub-categories:

- a) Outstanding Research Award
- b) Young Professional Award
- c) Woman Professional Award
- d) Technology Innovation Award
- e) Best Research Paper Award

6.1.2 ICFRE Outstanding Employee Awards - These awards will be given to the ministerial, administrative and technical staff of ICFRE and its institutes in two categories

- a) ICFRE outstanding employee Awards.
- b) ICFRE lifetime meritorious service Awards.

6.2 ONLINE APPRAISAL

The Annual Performance Appraisal Reports form the basis of evaluation of the working of the Scientists as well as other personnel working in ICFRE. In the present system, the following difficulties are being faced

1. Non-adherence to time-schedule for initiating/reporting/reviewing the APARs/AWRs. As a result, the period of reporting becomes as 'NO APAR' year



2. Delayed receipt of APARs/AWRs hampers in convening the meetings for promotion/assessment of scientists.
3. Misplacement of APARs/AWRs at various levels.
4. Non-adherence to the prescribed format for APARs/AWRs by scientists resulting in unnecessary correspondence.

In view of the above, online recording of APARs for Group A scientists/officials of the ICFRE will be adopted during this HRD plan period.

6.3 HIGHER REMUNERATION FOR JRF/SRF

For the realization of its research goals, ICFRE requires trained R&D personnel who provide support to the various research activities. ICFRE awards research fellowships and associateships at its research institutes and centres to provide manpower for conducting research under the expert guidance of scientists/foresters in their respective institute/centers. In order to attract qualified and talented personnel as JRF, SRF, RA, FA, PA, etc., their emoluments have been/ will be revised at par with the Ministry and other organizations.

6.4 PERIODICAL SEMINARS AND CONFERENCES

Organizing seminars/conferences to discuss research status on identified topics is important for improving the quality of research. It also gives an opportunity to share knowledge and ideas with the stakeholders as well as to provide platform for an in-depth analysis of themes and future research directions for ICFRE. Four broad categories of such seminars/conferences have been identified as given below

1. Institute level research seminars of half/one day duration to discuss current research and future strategies for the specified subject/priority areas.
2. Regional research conference of one/two days duration once in a year in each of the four regions to be organized with the various stakeholders for identifying the research needs of the region, explore possibility of new concepts leading to research projects and networking research option and opportunities.
3. National Forestry Research Conference to be organized for one/two days on any issue of contemporary/national significance once a year.
4. In addition, the Silviculture Conference will be held once in every four years for wider and extensive discussions and exchange of knowledge in the field of forestry.





COST ESTIMATES AND BUDGET

CHAPTER 7

COST ESTIMATES AND BUDGET

7.1 NATIONAL TRAININGS FOR SCIENTISTS/MANAGERS

Travel	Rs 20,000 per head
Boarding & lodging	Rs 3,000 per day per head
Training fee to host institution	
For Three days training	Rs 30,000 per head
For one-week training	Rs 40,000 per head
For two-week training	Rs 40,000 per head
Total Cost estimate	
For Three days training	Rs 65,000 per head
For one-week duration	Rs 81,000 per head
For two-week duration	Rs 1,02,000 per head

7.2 NATIONAL TRAININGS FOR TECHNICAL (RESEARCH SUPPORT) STAFF/EXECUTIVE STAFF

Travel	Rs 8,000 per head
Boarding & lodging	Rs 1,000 per head per day
Training fee to host institution	
For three days Training	Rs 20,000 per head
For one-week training	Rs 30,000 per head
Total Cost estimate	
For Three Days Training	Rs 33,000 per head
For one-week Training	Rs 45,000 per head

For induction training to be arranged in the institute/other local organizations

Technicians (one week)	=	Rs 15,000 per head
Technical assistants (two weeks)	=	Rs 40,000 per head
Senior Technical Officer (Two weeks At FRI DU)	=	Rs 50,000 per head





7.3 NATIONAL TRAININGS FOR ADMINISTRATIVE STAFF

Travel	Rs 4,000 per head
Boarding & lodging	Rs 800 per head per day
Training fee to host institution	
For 3 days Training	Rs 12,000 per head
Total Cost estimate	
For 3 days Training	Rs 20,000 per head
For induction training of two weeks to be arranged in the institute/ other local organizations	Rs 15,000 per head

7.4 INTERNATIONAL TRAININGS FOR SCIENTISTS

Travel	US\$ 2600 per head
Training fee to host institution	
For one-week training	US\$ 1000 per head
Daily Subsistence Allowance (DSA) @ US\$ 130	
For one-week training	US\$ 910 per head
Stay (Hotel) @ US\$ 130 per day per head	
For one-week training	US\$ 910 per head
Total Cost estimate	
For one-week duration	US\$ 5420

7.5 INTERNATIONAL EXPOSURE VISITS FOR MANAGERS

Travel	US\$ 2600 per head
Daily Subsistence Allowance (DSA) @ US\$ 130	
For one-week	US\$ 910 per head
Stay (Hotel) @ US\$ 130 per day per head	
For one-week	US\$ 910 per head
Total Cost estimate	
For one-week duration	US\$ 4420



HUMAN RESOURCE DEVELOPMENT PLAN (2018 – 23)

7.6 NATIONAL WORKSHOPS/ SEMINARS/ CONFERENCES (4 DAYS)

Travel	Rs 20000
Fee/Registration/Boarding & lodging	Rs 10000
Total cost estimate	Rs 30000

7.7 INTERNATIONAL WORKSHOPS/SEMINARS/CONFERENCES (7 DAYS)

Travel	US\$ 2600 per head
DSA @ US\$ 130	US\$ 910
Stay @ US\$ 130	US\$ 780
Registration fee	US\$ 325
Total cost estimate	US\$ 4615

Note: The cost estimation proposed above is tentative and subject to change as per the actual expenses. The training cost may vary depending on the prescribed fee structure of different resource training organizations, travel time, mode and training field. International trainings may also be considered for exceptionally brilliant and qualified research support staff. Funding may be considered on case-to-case basis considering the budgetary provision.

7.8 BUDGET REQUIREMENT

S. No.	Trainings	Details	3 days	1 Week	2 Week	Budget in Rs lakh
Skill Upgradation trainings						
1.	Professional skill upgradation trainings for Scientists/ Managers	No. of scientists	31	379	5	332.24
		Budget estimate	20.15	306.99	5.10	
2.	Professional skill upgradation trainings for Research Support Staff	No. of Technical staff	92	385	-	203.61
		Budget estimate	30.36	173.25	-	
3.	Professional skill upgradation trainings for Administrative Staff	No. of staff	415	-	-	83.00
		Budget estimate	83.00	-	-	
4.	Professional skill upgradation trainings for Executive Staff	No. of staff	-	20	-	9.00
		Budget estimate	-	9	-	
Total						627.85
Induction Trainings/National Conferences/Seminars						
5.	Induction training for scientists (45)					54.00



HUMAN RESOURCE DEVELOPMENT PLAN (2018 – 23)

6.	Induction training for Technical Staff	Group B (15 nos @ Rs. 40,000 per head)	6.00
		Group C (115 nos @ Rs.15,000 per head)	17.25
7.	Induction Training for Administrative staff	170 nos @ Rs 15,000 per head	25.50
8.	Induction Training for Executive staff	40 nos @ Rs 1.5 lakh per head	60.00
9.	National Seminars/ Workshops/ Conferences	100 nos	30.00
Total			192.75
10.	Awards 1. ICFRE awards for Excellence in Forestry 2. ICFRE Outstanding Employee Award)	Total 12 numbers of awards for ICFRE and Non ICFRE personals	50.00
		Total 22 numbers ICFRE outstanding employee awards	
Total			50.00
11.	International trainings for scientists	33 nos	116.25
12.	International Seminars/ Workshops/ Conferences	25 nos	75.00
13.	International Exposure Visits for Managers	25 nos	71.82
Total			263.07
Grand Total			1133.67





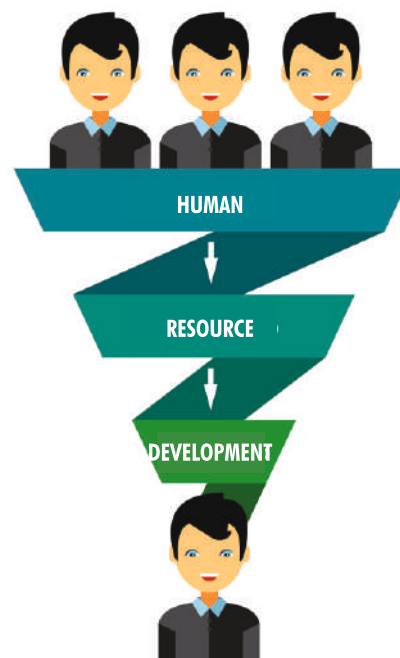
MODALITIES FOR EXECUTION OF HRD PLAN

CHAPTER 8

MODALITIES FOR EXECUTION OF HRD PLAN

Concerted efforts have been made by the Directorate of Education since the inception of ICFRE for developing the human resources of the institutes and centres. More systematic, goal oriented efforts were initially made during UNDP and World Bank supported programmes. In the current plan proposed for five (5) years i.e. from the year 2018-19 to 2022-23, induction as well as the professional skill upgradation trainings are proposed for all categories of staff. The total cost of the next five (5) year HRD plan is estimated to be Rs.1133.67 lakhs. The success of the proposed plan depends on the adequate budgetary allocation to the Directorate of Education as it is responsible for planning and execution of different trainings for the Scientists, Technical Executive and Administrative staff. Since the yearly budget for HRD programme may vary depending upon the fund allocation, periodical review to prioritize different programme becomes necessary depending on the emergent future needs and past experiences. The present funding to the Directorate is inadequate and efforts are to be made to increase funding in the budget of ICFRE for implementation of this HRD plan. The funding from other sources like CAMPA or Externally Aided Projects for certain components of the HRD plan would also be aimed at so as to bridge the gaps in funding for implementation of this plan.

The Directorate of Education needs to be strengthened for assessing the outcome of trainings conducted and their contribution in achieving the ICFRE mandate. Feedback from the participants and their future strategy to incorporate the know-how thus received in current and future research programme will form the basis to strengthen, finalize and organization of different HRD activities.





LIST OF ABBREVIATIONS

ACR	- Annual Confidential Report		Breeding
AFRI	- Arid Forest Research Institute	IFP	- Institute of Forest Productivity
AICRP	- All India Coordinated Research Project	IFRIS	- Indian Forestry Research Information System
APAR	- Annual Performance Appraisal Report	IFS	- Indian Forest Service
CAMPA	- Compensatory Afforestation Fund Management and Planning Authority	IIRS	- Indian Institute of Remote Sensing
CSWCRTI	- Central Soil Water Conservation Research & Training Institute	IISc	- Indian Institute of Science
DCF	- Deputy Conservator of Forests	IPIRTI	- Indian Plywood Industries Research & Training Institute
DSA	- Daily Subsistence Allowance	ITI	- Industrial Training Institute
EIA	- Environmental Impact Assessment	IWST	- Institute of Wood Science & Technology
FA	- Field Assistant	JFM	- Joint Forest Management
FRI	- Forest Research Institute	JRF	- Junior Research Forest
FRIDU	- Forest Research Institute Deemed to be University	NAP	- National Afforestation Programme
FSI	- Forest Survey of India	NGO	- Non-Governmental Organization
GCR	- Group Coordinator Research	MFCS	- Modified Flexible Complimentary Scheme
GIS	- Geographic Information System	PA	- Project Assistant
GIM	- Green India Mission	PSU	- Public Sector Undertakings
GPS	- Global Positioning System	RA	- Research Associate
GST	- Goods & Service Tax	RAG	- Research Advisory Group
HFRI	- Himalayan Forest Research Institute	RFRI	- Rain Forest Research Institute
HRD	- Human Resource Development	RPC	- Research Policy Committee
ICFRE	- Indian Council of Forestry Research & Education	SRF	- Senior Research Fellow
ICT	- Information and Communication Technology	TFRI	- Tropical Forest Research Institute
IFB	- Institute of Forest Biodiversity	UNDP	- United Nations Development Programme
IFGTB	- Institute of Forest Genetics & Tree	WII	- Wildlife Institute of India



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