

INTRODUCTION

The Indian Council of Forestry Research and Education (ICFRE) is the apex body in the national forestry research system to develop a holistic approach towards forestry research through planning, promoting, conducting and coordinating research, education and extension on all aspects of forestry for ensuring scientific management of forests, tree improvement, forestry productivity through scientific and biotechnological researches, bioremediation of degraded land, efficient utilization of forest produce, value addition of forest products, conservation of biodiversity and climate change, effective agroforestry models for various agroecological zones, policy research, environmental impact assessment and integrated pests and disease management.

Objectives of the ICFRE

- To undertake, aid, promote and coordinate forestry education, research and their applications.
- To develop and maintain a National Library and Information Centre for forestry and allied sciences.
- To act as a clearing-house for research and general informations related to forests and wildlife.
- To develop forestry extension programmes and propagate the same through mass media, audio-visual aids and extension machinery.
- To provide consultancy services in the field of forestry research, education and allied sciences.

- To undertake other jobs considered necessary to attain these objectives.

ICFRE has eight regional research institutes and three research centres in different bio-geographical regions of the country to cater to the forestry research needs of the nation. The regional research institutes are located at Dehradun, Shimla, Ranchi, Jorhat, Jabalpur, Jodhpur, Bangalore and Coimbatore and the centres are at Allahabad, Chhindwara and Hyderabad. The activities of these institutes and centres are described in separate chapters of the report. The activities of forestry research, education and extension at ICFRE headquarter are as under :

FORESTRY RESEARCH

Project Formulation Division acts as a nodal agency between ICFRE institutes and donor agencies, for coordination of the Research Projects of ICFRE Institutes/Centres in the identified thrust areas and their submission to various National and International donor agencies as per their funding requirements, coordinates the release of funds to ICFRE Institutes from the donor agencies and evaluates the Project proposals with regards to their suitability in the identified thrust areas. The JFM Programme related issues are dealt by this division like preparation of Training Manual etc.

Twelve International Projects and 126 National Projects are under various stages of implementation. Twenty three International Projects and 7 International Concept Notes have



been submitted for funding to 30 International Donor Agencies.

A Consultancy Project for Haryana Forest Department to prepare Modes Microplans for the JBIC Project on Integrated Natural Resource Management and Poverty Reduction is in progress.

Planning and Programme Division under the Directorate of Research deals with the planning, processing and execution of new research project proposals and review of the ongoing research projects of all the institutes under ICFRE.

During the year 2004-2005, Planning and Programme Division coordinated the Research Advisory Group (RAG) meeting at institute level. All ICFRE Institutes prepared a research plan for

their Institutes, after analyzing the forestry scenario in the region and identifying research needs to be addressed by it. This was followed by preparation of research projects by researchers. Finally these projects approved by RAGs were placed before 5th Research Planning Committee (RPC) as per the National Forestry Research Plan (NFRP).

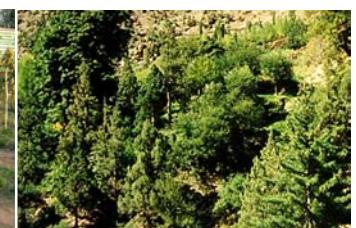
Research Policy Committee (RPC) Meeting was convened on 1st and 2nd May, 2005, under the chairmanship of Shri G.K. Prasad, D.G. ICFRE for according the final approval to the new research proposals submitted by eight research institutes under ICFRE.

The institute wise breakup of new and ongoing projects is as below :

Sl. No.	Name of the Institute	No. of new projects	No. of ongoing projects
1	Forest Research Institute, Dehra Dun	15	51
2	Arid Forest Research Institute, Jodhpur	4	28
3	Himalayan Forest Research Institute, Shimla	3	22
4	Institute of Forest Genetics and Tree Breeding, Coimbatore	8	19
5	Institute of Forest Productivity, Ranchi	3	17
6	Institute of Wood Science and Technology, Bangalore	6	63
7	Rain Forest Research Institute, Jorhat	7	14
8	Tropical Forest Research Institute, Jabalpur	8	33
	Total	54	247

Planning and Programme Division has also prepared an inventory of Completed Research Projects since the inception of ICFRE. A document "An Inventory of Completed

Projects of ICFRE Institutes, 1990–2004" was prepared and being updated continuously. The document is available at the ICFRE website.



Institute wise position of Completed Projects till date is as below :

Name of Institute	No. of Completed Projects
Arid Forest Research Institute, Jodhpur	30
Forest Research Institute, Dehradun	130
Himalayan Forest Research Institute, Shimla	37
Institute of Forest Genetics & Tree Breeding, Coimbatore	29
Institute of Forest Productivity, Ranchi	06
Institute of Wood Science & Technology, Bangalore	58
Rain Forest Research Institute, Jorhat	37
Tropical Forest Research Institute, Jabalpur	54
Total	381

Planning and Programme Division coordinated for India's participation in the 22nd session of International Poplar Commission, Santiago, held from 24th November to 2nd December, 2004 and prepared a country paper on "Contribution of Poplars and Willows in Sustainable Forestry and Rural Development in India". Two power point presentations, viz. "Poplar-A Gift for Indian Farmers" and "Dehradun, A Vibrant Venue for IPC 2008" were given by the DG ICFRE.

Planning and Programme Division has also coordinated with all ICFRE Institutes for preparing database on patents and is regularly monitoring it.

Environmental Impact Assessment (EIA) Division deals with the consultancies related to EIA and Environmental Management Plan which are the proven management tools for integrating environmental concerns in development process and for improved decision making. The Division has carried out following works :

Studies were undertaken by team of experts from the ICFRE, Institute of Forest Genetics and Tree Breeding (IFGTB), Coimbatore

and the Forest Research Centre (FRC), Hyderabad to assess the impact of realignment of Tellavagu Nullah (Seasonal Nullah) on flora and fauna—Evaluation studies for the Singareni Collieries Company Limited (SCCL), Kothagudem area, Dist., Khammam (Andhra Pradesh). A detailed report on the impact on flora, fauna and mitigation measures was submitted to the SCCL.

A draft report of final mine closure plan (Eco-rehabilitation plan) for Kudremukh Iron Ore Company Limited, Bangalore, was prepared and submitted for the first time in India as per directives of Hon. Supreme Court by the Council in coordination with Institute of Wood Science & Technology, Bangalore and CWPRS, Pune.

Environmental Impact Assessment, Socio-economic Impact Assessment, Environmental Management Plan and mitigation measures for the Bodhghat Hydro Electric Project (4 x 125 MW) in district Dantewara, Chhattisgarh for the Chhattisgarh State Electricity Board, Raipur was undertaken. Rapid EIA report and draft report on Enumeration, Ecological value, Biodiversity loss of gene pool and Reassessment of need of project-affected people of Bodhghat



Hydro Electric Project were submitted. Comprehensive EIA, SIA and Environmental Management Plan are under progress.

The EIA division of the Council has been entrusted with carrying out the Socio-economic Impact Assessment and cultural survey by the National Thermal Power Project Limited (NTPC), Noida (U.P.) for the proposed Tapovan Vishnugad Hydro Power Project 520 (4 x 130) MW in Chamoli District of Uttaranchal State. The Barrage of the project is proposed to be located on river Dhaul Ganga at village Tapovan. The project is likely to affect 8 villages, viz. Tapovan, Bhengule, Chamoli, Paiya/Chormi, Dhak, Ravigram, Shelong/Jharkula and Animath/Paini of Chamoli district.

Under the programme awarded by the National Afforestation and Eco-development Board of MoEF to the council, the Rain Forest Research Institute, Jorhat carried out the sample check survey of tree planting activities in Darang and Dibrugarh, Assam and reports are being prepared. Studies were undertaken by the TFRI to evaluate the coastal shelterbelt plantation of Bhubaneswar, Orissa and the reports are being prepared. Sample check survey of NAEB plantations was done by the RFRI in South Garo (Meghalaya) and Dimapur (Nagaland).

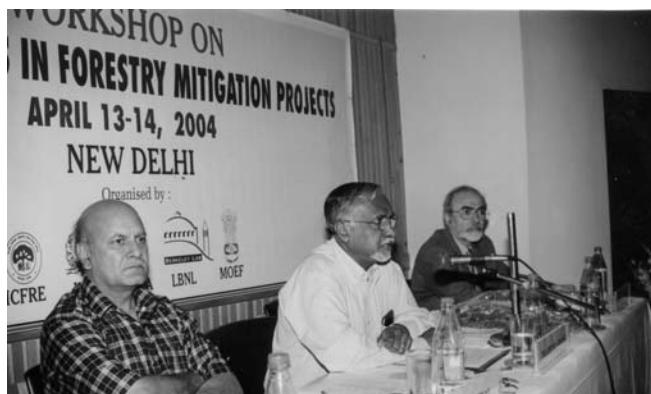
The Council has been awarded a project by the National Medicinal Plant Board (NMPB), Ministry of Health and Social Welfare, Government of India to evaluate and assess the promotional and commercial schemes provided to various agencies all over the States in India including the Union Territory except for the some of the States in central India. Accordingly, the EIA division of the council has Initiated the work.

Biodiversity and Climate Change (BCC) Division undertakes projects in the areas of

Biodiversity and Climate Change. The main activities are :

Recognizing the initiatives taken up by ICFRE and the active involvement of BCC division in Climate Change and Forestry related issues at the national and international level, United Nations Framework Convention on Climate Change (UNFCCC) has awarded the Observer Status to ICFRE. On being awarded the Observer Status, ICFRE can take part in various international meetings of COP/MOP as an independent organization.

‘FORCLIMIT-INDIA’ (Forests and Climate Change Mitigation Network) collaborative project which was initiated in the year 2002-2003, to address the assessment of mitigation opportunities and potential cost and benefits in selected localities in India, continued in 2004-2005. In phase-I of this project, two case studies in Uttaranchal on Carbon Sequestration Potential under farm forestry and community forestry scenario were completed. Under the US - India FORCLIMIT project, a two days workshop was also organized on “Methodologies in Forestry Mitigation Projects” at India International Centre, New Delhi on 13th and 14th April, 2004. Dr. Prodipto Ghosh, Secretary, Govt. of India, Ministry of Environment and Forest delivered the keynote address and emphasized on faithful partnership on Climate Change issues being developed by the US and India. Besides participation of the project partners viz. US Environmental Protection Agency, Lawrence Berkley National Laboratory (LBNL) of USA, Indian Institutes of Science and Ministry of Environment and Forests, representative from State Forest Departments, various other scientific organizations and NGOs also participated in the workshop.



Dr. Prodipto Ghosh Secretary, GOI, MoEF, delivering key note address on the occasion of inauguration of Workshop on Methodologies in Forestry Mitigations Project

Under EU-India Small Projects Facility Program, BCC Division of ICFRE successfully competed for the award of a project titled "*Beyond Kyoto: EU-INDIA CDM partnership: Promoting stakeholder dialogue and analysis of barriers to forestry mitigation projects*". The main objective of the project is to initiate stake holder dialogue and capacity building in the CDM and Forestry sector in India. A study on analysis of barriers to CDM forestry projects in India will also be conducted. This project is in partnership with Joanneum Research of Austria and Freiburg University Germany. The total grant awarded from EU is Euros 79, 000. The project also proposes to hold two international workshops to foster the dialogues and partnership in CDM forestry projects.

BCC Division is currently co-coordinating the prospects of revival of preservation plots for benchmarking biodiversity and also updating the ecological process and preserving gene pools of important species/ forest types. In 2004-2005

scientists of various Institutes of ICFRE and the officials of respective SFDs visited the forest areas of several States and Union Territories in order to physically verify the status of the preservation plots created by the Forest Research Institute from 1920 onwards.

A number of states e.g. Andhra Pradesh, Assam, West Bengal, Chhattisgarh, Gujarat, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Tamil Nadu, Uttaranchal and Uttar Pradesh have communicated the existence and maintenance of highly important Preservation Plots for assessing ecological changes occurring in representative areas over a period of time.

Once the status of Preservation Plots is known form all the States, ICFRE will attempt to structure and implement a programme for creation of more plots nation vide in consultation with the State Forest Departments.

FORESTRY EDUCATION

Grant-in-Aid to Universities: Financial supports were provided to the Universities imparting forestry education in the country in order to strengthen the infrastructural facilities of the forestry faculties such as office buildings, laboratories and field equipment, glass houses/ mist chambers, transport and camping equipments, computer centre, mini computer/PC terminals, library, sports, games and other students' amenities. Grant-in-aid has also been provided for enhancing the technical capabilities of the forestry faculties through promoting



workshops/seminars/symposia, participation of teachers in national seminars, symposium, students' study tours, assistance for preparation of teaching manuals, etc. Overall an amount of Rs. 200.00 lakhs was released under grant-in-aid to 11 Universities in 2004-2005 as follows :

Sl. No.	Name of University	Rs. in lakhs
1.	Dr. Y.S. Parmar University of Horticulture and Forestry, Nauni, Solan	7.30
2.	Kerala Agricultural University, Main Campus, Trissur	6.50
3.	Forest Research Institute (Deemed University), Dehradun	125.00
4.	H.N.B. Garhwal University, Srinagar	2.00
5.	Birsa Agricultural University, P.O. Kanke, Ranchi	8.00
6.	Jawaharlal Nehru Krishi Vishwavidyalaya, Jabalpur	7.00
7.	University of Agricultural Sciences, College of Forestry, Sirsi, Dharwad	12.50
8.	C.S.K. Himachal Pradesh Krishi Vishwavidyalaya, Palampur	9.65
9.	Chandra Sekhar Azad University of Agriculture and Technology, Kanpur	10.05
10.	Allahabad Agricultural Deemed University, Allahabad	7.00
11.	ASPEE College of Horticulture and Forestry, Gujarat Agriculture University, Navsari	5.00
	Total	200.00

FORESTRY EXTENSION

Media and Publication Division looks into the extension activities and strategies being adopted by institutes of ICFRE for the dissemination of research findings in forestry sector. This division maintains the monthly account of multifarious activities of ICFRE institutes and keeps MoEF apprised of them through monthly D.O. Letter of D.G., ICFRE. Quarterly Newsletter of ICFRE brings out the latest significant achievements made during the quarter by the ICFRE institutes in all the discipline of forestry. Besides this, work of updation of ICFRE Brochure is in progress. Annual Reports of ICFRE and its institutes are collected, compiled, edited and in the form of ICFRE Annual Report to be placed on the table of the Parliament. Editing, vetting and processing of books, brochures, pamphlets and technical

reports of ICFRE institutes by this division is mandatory before final publication. Various draft publications received from institutes were vetted by Media and Publication Division during the year, before final publication.

GENERAL ADMINISTRATION

Forestry Statistics Division carried out following works during the year :

1. Published Forestry Statistics India, 2003.
2. Four issues of Timber/Bamboo Trade Bulletin were published.
3. Statistical assistance was provided to Environmental Impact Assessment Division for its project for Chhattisgarh State Electricity Board.



4. Delivered lectures to FRI Deemed University.
5. Imparted statistical advice to various ongoing projects of FRI.
6. A project funded by Central Statistical Organization, Ministry of Statistics and Programme Implementation, Govt. of India, is being implemented with the help of all ICFRE institutes. An Orientation Programme for the supervisors was conducted at Van Vigyan Bhawan on 27th and 28th January, 2005.
7. Gave Technical Opinion to Punjab Forest Department regarding determination of correct sample size and sample intensity percentage so as to estimate felling from in a particular area.
8. Lectures delivered to ISS probationers.

Information Technology Division under the Directorate of Administration, ICFRE, being a service providing cell caters to all kind of Information Technology needs of the users at ICFRE Headquarters and FRI. The main activities of the cell are training, LAN-WAN support, e-governance and maintenance of hardware. The following are the main achievements :

- Provided inhouse training to the ICFRE and FRI Officers and staff and to the students of FRI Deemed University.
- Maintained different types of servers (10 in number) and other network devices for smooth functioning of LAN and WAN.
- Maintenance of E mail servers and proxy servers to provide round the clock email and internet services to users.
- Hoisting of ICFRE Website (icfre.org) and websites for two other ICFRE-Institutes; <http://hfri.icfre.org>; <http://rfri.icfre.org>. In

addition to hoisting website on medicinal plants <http://marketinfoherbs.icfre.org>; and the site of Indian Forester <http://indianforester.icfre.org>.

- Maintenance of IFRIS (Management Information System) centralized Oracle Database, ensuring FAS / Payroll support to DDO's at ICFRE and FRI.
- Maintenance of a SUN Server, hoisting a TLSM (Total Library Automation Software Management System) Oracle Database of the National Forest Library and Information Centre.
- Providing centralized network antivirus management server takes care of the virus problems round the clock.
- The Cell liaisons between the users and AMC vendors.

MAJOR ACHIEVEMENTS

- FRI, Dehradun obtained VAC-FRI technology for treatment of green bamboo on 14-06-2004.
- Use of *Pseudomonas fluorescence* as root protectant against the infection of *Fusarium solani* was confirmed in the seedlings of Shisham.
- Bamboo-endomycorrhiza system was worked out for the integration of mycorrhiza in boosting the growth and proliferation of *Dendrocalamus strictus*.
- Methods were standardized for production of alpha cellulose and its derivatives from *Lantana camara* for a variety of applications paving thereby a way for management of this obnoxious weed by its utilization into products of commercial importance.
- Reaction conditions were standardized for production of polysaccharide derivatives – graft co-polymers of *Cassia occidentalis*



seed gum with vinyl monomers; water soluble quaternized and cyanoethylated TKP; water soluble carboxymethyl cellulose, and organo soluble cyanoethyl cellulose from cellulose of *Dendrocalamus strictus* bamboo and cotton linters.

- *Ex-situ* conservations of 120 species belonging to 80 genera and 4 families of forest origin from central India have been made in TFRI campus.
- Non-destructive harvesting methods of Kalmegh (*Andrographis paniculata*) standardized.
- Multiplied 3,00,00000 wasps of *Trichogramma rosae* and introduced in 200 hectare Teak plantations of Maharashtra and Madhya Pradesh to minimise the out break of Teak defoliator and skeletonizer. It minimised more than 50 per cent annual loss of Teak growth.
- An agroforestry model consisting of tree species (*Tectona grandis*, *Gmelina arborea* and *Emblica officinalis*) and crop species (soyabean and wheat) has been developed and demonstrated to produce high yield with *E.officinalis*.
- Developing a suitable database on biodiversity.
- Selection of potential mycorrhizas and other beneficial microbes for the reclamation of bauxite mine spoils.

MAJOR RESEARCH FINDINGS

- A software on forest soil information system for India has been developed by FRI, Dehradun. Data for three hundred soil profiles has been entered from various parts

of India. Database is user friendly and data can be easily entered and retrieved.

- A database for information on seventy species of rare and endangered plants of south India has been developed by IFGTB, Coimbatore.
- Eco-friendly preservatives have been standardized for control of biodeterioration of wood by IWST, Bangalore.
- Development of computer based Forest soil information system for India.
- Molecular cataloguing of 36 plus trees of Teak from 11 states of India and one allied species (*Tectona hamiltoniana* Wall.) endemic to Myanmar using RAPD markers.
- Identified April to July as the best period of adventitious rooting in culm cuttings and side branch cuttings of *Bambusa tulda*, *B. vulgaris* var. green, *B. multiplex* and *Dendrocalamus membranaceus*.

ICFRE AWARDS FOR EXCELLENCE

Awards

“ICFRE Award for Excellence” for the year 2003-2004 was awarded to Dr. Genda Singh, Scientist, AFRI, Jodhpur for the outstanding work in the discipline of Forestry Research and to Dr. S. Balaji, IFS, Department of Environment in the discipline of Forestry Conservation.

For the outstanding scientific work for the protection of forest seeds, nursery seedlings and plants from various kind of diseases. Dr. Jamaluddin, Scientist-F of TFRI, Jabalpur was awarded the Vishisht Vigyanik Puraskar for the year 2001-2002.

FOREWORD

I am glad that Media and Publication Division of Indian Council of Forestry Research and Education (ICFRE) has brought out Annual Report for the year 2004-2005. This report encompasses the progress of the council during the period under report. Since its inception in 1986 and subsequent attainment of autonomy in 1991, the ICFRE has come a long way in the field of forestry research, extension and education.



The research carried out under the leadership of ICFRE by its eight institutes and three centres spanning through out the length and breadth of India is deep and extensive. With the thrust on new emerging areas such as Environment Impact Assessment (EIA), conservation of biodiversity, global warming, people's participation in forest management, conservation and *ex-situ* cultivation of medicinal plants, the research in ICFRE has attained new dimensions.

Collaboration with various National and International organizations in the field of forestry research is becoming a formidable asset of the council. During the year many senior scientists and research managers from almost all the continents showed greater interest in the activities of the council which is evident from their visits to the council and its institutes. Scientists and officers of ICFRE and its institutes also visited various countries to share the experience in the field of forestry research.

The Council has a clear thinking in the field of extension of research in order to disseminate the achievement of research to the farmers, state forest departments and others stake holders engaged in the forestry sector. Various technologies developed by the institutes of ICFRE are being disseminated to the village level by way of demonstration plots, workshops and seminars etc.

The Council is also helping various universities by way of providing grants-in-aid in the field of forestry education. During the year, Council released Rs. 200 lakhs as grant-in-aid to 11 universities.

By virtue of competent and hardworking scientists, officers and staff, I am sure, the ICFRE will attain excellence in the field of forestry research, extension and education and will keep on working towards attaining the national goal of bringing 1/3rd of geographic area of this great country under forest cover alongwith providing sustainable livelihood to the people who live in and around forests.


(G.K. Prasad)
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ANNUAL REPORT

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LIST OF ABBREVIATIONS

AFRI	Arid Forest Research Institute
AMF	Arbuscular Mycorrhizal Fungi
APFDC	Andhra Pradesh Forest Development Corporation.
APMP	Alkaline Peroxide Mechanical Pulping
CD-ROM	Compact Disc Read Only Memory
CFR&HRD	Centre for Forestry Research and Human Resource Development
CPT	Candidate Plus Tree
CSF&ER	Centre for Social Forestry Research and Eco-Rehabilitation
CSIRO	Commonwealth Scientific and Industrial Research Organization, Australia
CSO	Clonal Seed Orchard
CTG	Cassia Tora Gum
ESF	Extension Support Fund
FRC	Forest Research Centre
FREE-P	Forestry Research Education and Extension Project
FRI	Forest Research Institute
FRLHT	Foundation for Revitalization of Local Health Tradition
FYM	Farm Yard Manure
GACL	Gujarat Alkali and Chemicals Ltd.
GEF	Global Environmental Facility
GHG	Green House Gas
HFRI	Himalayan Forest Research Institute
HPLC	High Performance Liquid Chromatography
ICFRE	Indian Council of Forestry Research and Education
IFFDC	Indian Farm Forestry Development Cooperative
IFGTB	Institute of Forest Genetics and Tree Breeding
IPM	Integrated Pest Management
IPMA	Indian Paper Manufacturers Association
IPT	International Provenance Trial
IR	Infra Red
IRS	Institute of Remote Sensing
ISSR	Inter Sample Sequence Repeat
IWST	Institute of Wood Science and Technology
KFD	Kerala Forest Department
LAN	Local Area Network

LOSP	Light Organic Solvent Preservative
MPT	Multi Purpose Tree
NABARD	National Agricultural Bank for Agriculture and Rural Development
NFLIC	National Forest Library and Information Centre
NFT	Nitrogen Fixing Trees
NMR	Nuclear Magnetic Resonance
NOVOD	National Oil Seed and Vegetable Oil Development
NRDC	National Research Development Corporation
NWFP	Non-Wood Forest Produce
PFM	Participatory Forest Management
PGD	Post Graduate Diploma
PSB	Phosphate Solubilizing Bacteria
PSIP	Planting Stock Improvement Programme
PT	Progeny Trial
PTG	Primitive Tribe Groups
RAPD	Randomly Amplified Polymorphic DNA
RBD	Randomized Block Design
RCBD	Randomized Complete Block Design
RDBMS	Research Data Base Management System
RFRI	Rain Forest Research Institute
SP	Self Pruning
SPA	Seed Production Area
SPM	Suspended Particulate Matter
SSO	Seedling Seed Orchard
SSPA	Seedling Seed Production Area
TFRI	Tropical Forest Research Institute
TKP	Tamarind Kernel Powder
TLC	Thin Layer Chromatography
TNFD	Tamil Nadu Forest Department
USDA	United States of Department of Agriculture
UV	Ultra Violet
VAM	Vascular Arbuscular Mycorrhiza
VMG	Vegetative Multiple Garden
WAN	Wide Area Network

ORGANISATIONAL STRUCTURE OF ICFRE

