

**NATIONAL CONFERENCE
ON
TOWARDS RESILIENT ECOSYSTEMS: THE ROLE OF FORESTRY RESEARCH**

8-9, MAY 2018

**Organized by
Institute of Forest Genetics and Tree Breeding
(*Indian Council of Forestry Research and Education*)
Coimbatore**

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Background

Forest sector is uniquely placed in Climate Change scenario as on one hand deforestation and forest degradation contributes significantly to the warming of global climate systems, and on other hand forests have the potential to arrest the fast pace of changing climate by removing accumulated carbon dioxide from atmosphere and sequester it into vegetation and soil. However, being climate dependent systems, forests are also vulnerable to the changing climate. Forests in India are already under heavy socio-economic pressures leading to forest degradation. The changing climate is likely to further adversely impact the forest ecosystems in many ways.

A study by Indian Institute of Science in 2006 on analysis of the 35,190 forested grids at national level reports that more than two third forested grids are likely to undergo vegetation change by the year 2100. Almost all major forests of India, viz., Deodar, Fir-Spruce, Sal, Chir-pine, Fir, Blue pine, Mixed Conifers, Western Ghat semi-evergreen forests, Western Ghat evergreen forests, Mangroves, Khair-Sissoo forests, Scrubs, Miscellaneous forests, Up-land Hardwoods, Teak, Bamboo forests, Khasi pine and Dipterocarps species are likely to be impacted by the projected Climate Change. The study further states that the actual impacts may be more as different species respond differently to the changing climate. These impacts are expected to have adverse socio-economic implications for the forest-dependent communities and the economy of the country. Moreover the impacts of Climate Change on forest ecosystems are likely to be long-term and irreversible.

According to India's National Communication to UNFCCC in 2012, the climate modeling for likely impacts of Climate Change on natural ecosystems and biodiversity in India has shown that 30.6% of forests are projected to be vulnerable as per A1B SRES IPCC scenario by the year 2035 which is likely to increase to 45.9% by the year 2085. The vulnerability is expected to be

linked with low tree density and biodiversity status, higher levels of fragmentation and greater elevations of forests. Vulnerability analysis of forest ecosystems in the national communication demonstrates that Climate Change can significantly affect the availability of forest goods and service in terms of quality and quantity.

According to the IPCC, roughly 20-30% of vascular plants on the planet are estimated to be at an increasingly high risk of extinction as temperatures increase by 2-3°C above pre-industrial levels. Even small changes in climate could affect phenological events such as flowering and fruiting that may escalate into major impacts on forest biodiversity. This is because co-evolution has produced highly specialized interactions among specific plant and animal species in natural forests. Overall, it is very likely that even modest losses in biodiversity would cause consequential changes in the ecosystem services that forests provide. In this context, the resilience of forests ecosystems is an important attribute which will assure the sustainability of the functions of ecosystems. Successfully increasing the resilience of natural systems may therefore have important implications for human welfare in the face of global climate change.

The resilience of a forest ecosystem to changing environmental conditions is determined by its biological and ecological resources, in particular, i) the diversity of species including micro-organisms, ii) the genetic variability within species and iii) the regional pool of species and ecosystems. Scientific deliberations and discussions on this subject of "Ecosystem Resilience" are the need of the hour for ensuring sustainable flow of forest ecosystem services. Further, there is an imperative need to review and revisit Research and Development initiatives taken by various State Forest Departments and Research Organizations on the subject of Forest Ecosystems Resilience. In this backdrop, a National Conference is proposed to be conducted on "**Towards Resilient Ecosystems: The Role of Forestry Research**" ' on **8-9, May 2018** by the Institute of Forest Genetics and Tree Breeding, Coimbatore. The following are the Theme areas identified for the Conference presentation and deliberations.

Session 1: VULNERABILITY ASSESSMENT

Despite their utility and ecological importance, forests in India are degrading due to a number of pressures and disturbances like diversion of forest land for developmental activities, unsustainable harvests of forest products, encroachments, forest fires, massive proliferation of alien invasive species, pest and disease outbreaks and other biotic and abiotic interferences like vagaries of climate change. There are evidences reported in India and elsewhere. However, there is dearth on discussions and deliberations on this critical issue of Vulnerability of forests ecosystems and biodiversity to the changing climate. This first session of the National Conference will have presentations on likely impacts of climate change on forests and biodiversity of India and deliberate on vulnerability assessments on various threat factors along with evidences so as to bring out recommendations and future directives to plan research and development programme on this critical subject.

Session 2: TREE IMPROVEMENT AND BIOTECHNOLOGICAL STRATEGIES FOR CLIMATE RESILIENCE

Trees as perennials possess vast amounts of genetic variation which provides the inherent ability to adapt to different environments. From the utilization point of view, this variation helps in selecting specific taxa / accessions to suit a given planting area and end use. Since the genetic constitution always interacts with the environment at different levels for different characters, it is important to develop suitable cultivation practices to realize the full potential of the trees raised in plantations. In this context, tree improvement techniques can take care of both increasing plantation productivity and developing climate-resilient trees.

Like tree improvement strategies, various biotechnological tools also have potential to address challenges related to climate change. Exploration of approaches to maintain or enhance tree productivity through initiatives on molecular breeding for abiotic stress like salinity, water logging, drought, heat and cold tolerance is underway globally. Carbon di-oxide harnessing ability and associated physiological responses of tropical trees towards climate change conditions have also been documented. In this context, this session will discuss the role of tree improvement and biotechnological strategies towards climate change adaptation and recommend most suitable strategies for Afforestation / Reforestation programmes in the future for enhanced resilience.

Session 3: HARNESSING FOREST GENETIC RESOURCES FOR CLIMATE RESILIENCE AND FOREST HEALTH

The challenge of climate change requires us to reframe our forest genetic resources. This calls for a climate proof strategy for conservation, documentation and characterization of forest genetic resources of prioritized species at National level. Recent studies have documented that climate change is very likely to cause changes in fire frequencies as well as incidence of pest and disease attacks in forest ecosystems. This necessitates developing fire protection and management Practices; development of temperature, drought and pest resistance in commercial tree species; risk assessment and management of invasive alien species and develop prediction model and implementation of advance forewarning systems for fire, pest and diseases outbreaks. Hence, this session of the Conference is to deliberate on methods to conserve the vast forest genetic resources of the country and to recommend management strategies towards health of forest ecosystems in view of perceived risks due to climate change.

Session 4: ADAPTIVE FOREST MANAGEMENT: ISSUES AND CHALLENGES

Adaptation in forest sector has to follow a holistic ecosystem approach as it is intricately related to all its components i.e. forests, plantations, biodiversity, water resources and other biotic and abiotic components. However, there are enormous challenges due to heavy dependence of communities on forest ecosystems for various products and services. Hence, the session aims to deliberate on different components of adaptive forest management that could moderate the potential damage caused by Climate Change and benefit from the opportunities created by it. It is expected to help the forest managers to understand the changing management objectives and build strategies to cope up with the new challenges. This would also require reorientation of forestry research.

Session 5: CLIMATE-SMART FORESTRY: RESEARCH AND MANAGEMENT

In keeping with the challenges of Climate Change, Government of India is implementing Green India Mission which has been crafted as a strategy for mitigation and adaptation to the changing climate. New National Working Plan Code of 2014 also requires that concerns on climate change be also addressed in the planning process for forest management. The country is also gearing up to finalize REDD-plus strategy and mechanism so that forest communities could

be involved and rewarded for their contributions towards mitigation of climate change. A new National Forest Policy, 2018 is also in offing. These actions have been taken to adjust management for forest ecosystem services i.e. "**adaptation**" and increase carbon sequestration i.e. "**mitigation**". In this backdrop, the session is expected to discuss and deliberate on scope of Forestry Research to enhance ecosystem sustainability, adaptation, and mitigation potential for developing approaches for Policy makers, planners, Forestry practitioners, and researchers. .

Session 6: WRAP UP: DRAFTING OF RECOMMENDATIONS

The session will begin with brief presentations by the Conveners of all the sessions on deliberations and recommendations made in the sessions. All the recommendations will be deliberated upon by the panelists and participants and finalized for submission to MoEF & CC by the ICFRE.

Participation: Institute of Forest Genetics and Tree Breeding, Coimbatore propose to extends its invitation for participation in this National Conference to officials from Ministry of Environment, Forest and Climate Change (MoEFCC), All the Principal Chief Conservator of Forests (PCCFs) of State Forest Departments, All the DDGs and Directors of ICFRE and Its Institutes. IFGTB also extends its invitation to the subject experts in the reputed organizations in the country and nominated Scientists from ICFRE institutes to deliver Lead Presentations and Invited Talks on the themes of the Conference.

Venue: The venue is Institute of Forest Genetics and Tree Breeding, Coimbatore (Tamil Nadu) located in Forest Campus, R.S.Puram which is 4 km away from Coimbatore Railway station and 15 km away from Coimbatore Airport.

About City: The city is situated at 411 meters, above mean sea level with Summer temperature ranging from Maximum of 34.7°C and Minimum of 21.1°C and Winter temperature ranging from Maximum of 32.2°C and Minimum of 19.2°C.

Accommodation: Organizers will make the best possible arrangements for limited accommodation in Guest Houses of the Institute and sister organizations.

Organizing Committee

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