



## Conference Report

### International Conference on Population and Conservation Genetics

28–30 January 2026

Coimbatore, India

Host Institute: ICFRE-Institute of Forest Genetics and Tree Breeding, Coimbatore, India

Organizers: IUFRO Unit 2.04.01 - Population, Ecological and Conservation Genetics & Asia-Pacific Forest Genetic Resource Programme (APFORGEN)

Venue: Vivanta Coimbatore, India

Climate change and the increasing vulnerability of forest ecosystems are major concerns for tree biologists. The rapid decline in genetic resources and biodiversity is a critical factor affecting forest health, adaptability, and resilience. Understanding population diversity and its underlying dynamics is the cornerstone of conservation, domestication, and the effective utilization of tree genetic resources.

The conference primarily focused on the population dynamics of forest tree genetic resources in the context of addressing ecological and climatic challenges. The **International Conference on Population and Conservation Genetics (ICPCG 2026)** emphasized the study of population and conservation genetics to better understand the changes occurring in forest tree populations under shifting ecological and climatic conditions.

The conference was inaugurated by Smt. Kanchan Devi, Director General, Indian Council of Forestry Research and Education on 28 January 2026. She enumerated the pioneering role of ICFRE in providing scientific foundation to sustainable forestry in India. She also highlighted the significance of the conference in the era of changing climatic and ecological



landscape and emphasized the need for global cooperation for translation of scientific

advancement into resilient and sustainable forest management. Prof. Filippos Aravanopoulos, Coordinator–IUFRO Unit 2.04.01 Population, Ecological and Conservation Genetics delivered a special address and highlighted the role of IUFRO in advancing forestry research at global level.

Shri T. Rabi Kumar, Director, ICFRE-Institute of Forest Genetics and Tree Breeding highlighted the significant milestones of the host Institute in tree improvement programs in addressing the raw material requirement of the paper and pulp industries and reiterated the need for networking at national and international levels to provide real world solutions to forestry science.



The conference also hosted the Executive Committee meeting of Asia Pacific Association of Forestry Research Institutions (APAFRI). The 30<sup>th</sup> Meeting of the APAFRI Executive Committee was held on January 28, 2026, in Coimbatore, India. Conducted in-person, this meeting focused on regional forestry research, networking, and sustainable forest management initiatives. The meeting aimed to guide, review, and endorse the organisation's work programs and budget.

The conference was attended by more than 100 delegates from 11 countries including India representing Research Institutes, Academia, State Forest Department, Paper and Pulp industries and NGOs. The conference included three structured sessions with 12 themes



- ✓ Strategies to assess and trace adaptability of tree populations
- ✓ Conservation of Tree Genetic Resources
- ✓ Building collaborative networks to scale-up conservation efforts

A total of seven thematic keynotes, 23 oral presentations, 24 short oral presentations and 2 posters were presented in the three-day event. The interlinked thematic areas highlighted the shift in conservation of tree genetic resources in isolation to integrated, landscape level and people centric approaches. Participatory and community level engagement and global networking for better decision-making and program implementation was emphasized in the sessions.

An exhibition showcasing the innovations and cutting-edge advancements made by MAK India Ltd, Coimbatore, Genotypic Technologies Pvt. Ltd., Bengaluru, Chromosome Labs Pvt. Ltd., Mumbai and Bionivid Technology Pvt. Ltd., Bengaluru was hosted by the conference. Further, an all-digital ICFRE pavilion displayed the achievements made by ICFRE Institutes.



One of the major events during the conference was the Youth Forum held on 29 January 2026 which was attended by 104 students of 12 schools in the Coimbatore. Students were invited to make Digital Posters on different themes focusing genetic diversity, biodiversity and climate change. The forum was graced by Dr. Manimekalai Mohan, Founder and Trustee, Shree Saraswati Vidhyaah Mandheer (SSVM) Institutions, Coimbatore who also delivered the special address. These interactions helped bridge the gap between classroom learning and real-world scientific research and conservation practice. The best presentations evaluated by international referees, were awarded certificates and prizes. Smt. Kanchan Devi, Director General, ICFRE presented medals and certificates to the winners. The Youth Forum successfully fostered scientific curiosity, collaboration, and meaningful youth participation, thereby contributing significantly to the objectives of the International Conference on Population Genetics and Conservation 2026.



In the final concluding session of the conference, the theme-wise draft recommendations were presented by Dr. Modhumita Dasgupta, Organizing Secretary, ICPCG2026. It was decided that the document would be further compiled for submission to IUFRO, APFORGEN and COP17. Prof.

Santishree Dhulipudi Pandit, Vice Chancellor, Jawaharlal Nehru University, New Delhi during the

concluding session emphasized on the role of youth in addressing the challenges of climate change and reiterated the need for networking between academia, research



institutes, forest departments, farming community and other stakeholders for impactful translation of research results.

## **Recommendations**

The session and theme-wise draft recommendations of the conference is given below:

### **Session I: Strategies to assess and trace adaptability of tree populations**

Themes 1 and 2: Landscape and ecological genomics and genetics and genomic tools for tracing adaptive variability

- ✓ Genetic and genomic research can provide key insights into the adaptive capacity of forest tree populations and research results should be applied for the conservation and management of forest trees genetic resources, especially under changing climate and environmental conditions.
- ✓ Results of the studies on the distribution and structure of genetic diversity should be used more widely in setting conservation priorities and identifying seed sources for reforestation and restoration.
- ✓ Conservation efforts should also include isolated tree populations showing low genetic diversity especially marginal and peripheral populations.
- ✓ There is a need to further develop forest management practices for conserving genetic diversity in natural tree populations and utilizing this diversity for breeding.

Theme 3 Genetic basis of local adaptation

- ✓ Trees are foundation species for forest ecosystems, and the current rate of environmental change poses local adaptation studies as a key priority area of research, for maintaining species diversity and ecosystem functioning.
- ✓ Genomic forecasting is promising but needs to be continuously validated with field and common garden data.
- ✓ A multitude of genetics and omics approaches in forest trees, such as cytogenetics, molecular genetics, transcriptomics, genomics and epigenomics, can provide insights to performance, adaptive capacity, adaptive divergence and forest tree breeding.
- ✓ Genetic markers continue to be invaluable to forest genetics research related to adaptation, showing their efficacy in temperate, sub-tropical and tropical species.

Theme 4 & 5: Emerging technologies for developing climate resilient trees & Genetic monitoring and management of tree populations

- ✓ Genetic monitoring, despite its importance as early-alert system of forest decline, has still to be implemented more generally. Development of cost-effective genetic monitoring approaches is needed for its wide implementation.

- ✓ Population genetics via the computation of statistics such as genetic diversity, inbreeding, and genetic differentiation, among others, can provide valuable information on how genetic variation is distributed among and within populations, which is needed for effective genetic conservation.
- ✓ Because the genetic architecture of most adaptive traits is polygenic, studies of local adaptation based on genomics need to rely on multilocus approaches. If possible, these approaches should be combined with the measurement of functional traits.
- ✓ A new generation of pangenomes will substantially help to develop further the field of population and conservation genetics, by providing not only access to large SNP (Single Nucleotide Polymorphism) dataset but also by giving access to structural variants (SVs).
- ✓ Genomic selection stands out as a useful data-driven strategy for molecular breeding and has the potential of accelerating breeding, which is much needed in commercial species with long breeding cycles such as teak.
- ✓ Understanding adaptation responses to adaptation via expression studies (e.g. such as salt adaptation), and validation of relevant genes using transformation opens way for plant engineering and development of new biotechnology applications.

## **Session II: Conservation of Tree Genetic Resources**

Theme 6 and 7: Strategies for ecological and economic sustainability of tree genetic resources & Habitat/ landscape restoration

- ✓ Establish Permanent Preservation Plots within natural FGR conservation areas for Monitoring genetic resource performance under climate change, linking growth data with genetic variability and Supporting future breeding and restoration.
- ✓ Deployment of full-sib seed lots over mono-clonal deployment for maintaining genetic diversity and assuring sustainability in clonal forestry.
- ✓ Site-specific management and genetic-resources based management strategies are required for conservation of isolated populations in the context of climate change scenarios.
- ✓ In-vitro priming strategies can be explored for enhancing climate resilience in tree species.

Theme 8 and 9: Tree seed system for ecological restoration and Conserving and restoring genetic diversity of forests in Asia – Pacific region

- ✓ A certification system for tree seeds - recognized within each country and internationally is essential to ensure -uniform seed quality.
- ✓ Modeling tools such as C4R system may be considered in strengthening the management of seed sources especially in forecasting the threats

- ✓ Capacity-building programs are needed to ensure stakeholders across the seed supply chain adhere to established best practices.
- ✓ Establish harmonised seed policies, seed zones, and quality standards across Asia–Pacific countries to ensure availability of genetically appropriate, high-quality planting material for ecological restoration
- ✓ Identify, map, and manage diverse seed sources (seed stands, CSOs, SSOs, plus trees, and wild populations) to maintain genetic representativeness and reduce dependence on narrow or unknown provenances.
- ✓ Embed restoration genetics principles-such as adequate population sizes, composite provenancing, and climate-adjusted seed sourcing-into all forest and landscape restoration programmes.
- ✓ Strengthen protected areas, ecological corridors, seed banks, clonal archives, and cryo-conservation facilities to conserve threatened and economically important forest genetic resources.
- ✓ Invest in training for forest managers, researchers, nurseries, and local communities on seed collection, handling, nursery production, and genetic resource management, recognising traditional knowledge systems.
- ✓ Develop regional databases and monitoring networks to track seed supply, genetic diversity, and restoration outcomes, enabling adaptive management and evidence-based policy decisions.

### **Session III: Building collaborative networks to scale conservation efforts**

#### Theme10 Strengthening collaboration to conserve tree genetic resources

- ✓ International and regional collaboration must be reinforced for the conservation and sustainable use of tree genetic resources.
- ✓ Need for strengthening extension activities to enhance tree seed systems, promote participatory programs accelerate deployment of improved germplasm across ecological regions.
- ✓ Increase the use of improved clones and varieties by industries and SFDs to secure raw material availability.
- ✓ Extension targeting farmers can promote income generation and livelihoods, ecorestoration and the conservation and sustainable use of tree genetic resources.
- ✓ Strengthen and formalize collaboration among forestry agencies, research institutions, gene banks, and universities across the Asia–Pacific region to jointly assess, conserve, and manage tree genetic resources through shared protocols, data exchange, and coordinated conservation priorities.
- ✓ Facilitate collaborative programmes for joint research, training, and technology transfer on forest genetics, tree seed systems, and conservation methods, ensuring compliance with access and benefit-sharing frameworks and national regulations.

#### Theme 11&12: Participatory Forest Management & Forensic timber identification

- ✓ Participatory forest management i.e. involvement of communities should be advanced as it is very important and essential in conservation of species, ecotourism, restoration of marine ecosystems.
- ✓ Use of timber DNA barcoding in timber forensics for timber related crimes is very important in identifying the timber species and also tracing their origin especially in tree species such as Santalum, sandalwood and Dipterocarpus. etc.
- ✓ Partnership of ICFRE with national and international forestry institutions and agencies.
- ✓ Need to engage local communities to effectively manage forest resources.
- ✓ Integrating participatory approaches with forest genetics can strengthen forest protection, legality and sustainable forest management.

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