



Timberline and Altitudinal Gradient Ecology of Himalayas, and Human Use Sustenance in a Warming Climate



Need for Timberline Research

Understanding environmental changes associated with the high-altitude limit of forests, generally called "timberline" (Box 1) is of critical importance in the Himalaya (Box 2).

Climate change-induced structural and functional changes in timberline vegetation may have implications to biodiversity, wildlife habitats, provisioning of ecosystem services to people, medicinal plants, grazing sites for migratory livestock, recreational use, etc.

Box 1 Some definitions of Timberline/Treeline

- An imaginary line on a mountain or high area of land that marks the level above which trees do not grow
- the upper limit of arboreal growth in mountains or high latitudes —called also *tree line*
- the altitude above sea level at which timber ceases to grow
- the Arctic or Antarctic limit of tree growth

Sources: Merriam-Webster's Learner's Dictionary
Dictionary.com Unabridged

Box 2 Specificities of Himalayan Timberline

- (i) Highest in the world
- (ii) Effective indicator of climate change
- (iii) Contradictory reports on its response to climate change (e.g., upward movement of timberline)

Key Features of the IHTP Project

- Highly Mountain-specific Issue of Climate Sensitive Higher Himalayas
- Timberline as new entity of -
 - Conservation
 - Management
 - Societal Benefits
- Culture of Team Research through Multiple -
 - Disciplines
 - Locations
 - Institutions

Project Team

Prof. Z.A. Reshi (zreshi@yahoo.com) University of Kashmir
Dr. R.S. Rawal (ranbeerrawal4@gmail.com) G.B. Pant Institute of Himalayan Environment & Development
Dr. H.K. Badola (hkbadola@gmail.com) G.B. Pant Institute of Himalayan Environment & Development
Dr. G.C.S. Negi (negigcs@gmail.com) G.B. Pant Institute of Himalayan Environment & Development
Dr. S. Sharma (subrat63@gmail.com) G.B. Pant Institute of Himalayan Environment & Development
Dr. R. Joshi (dr.rajeshjoshi@gmail.com) G.B. Pant Institute of Himalayan Environment & Development
Dr. B.S. Adhikari (bsadhikari75@gmail.com) Wildlife Institute of India
Dr. A. Tewari (atewari69@rediffmail.com) Kumaun University
Dr. P. Ranhotra (ranhotra.p@gmail.com) Birbal Sahni Institute of Palaeobotany
Dr. A. Bhattacharya (amalava@yahoo.com) Birbal Sahni Institute of Palaeobotany
Dr. P. Tewari (pankutewari@gmail.com) Central Himalayan Environment Association

Coordinator

Prof. S.P. Singh (surps@yahoo.com) Central Himalayan Environment Association
Project Management Unit, CHEA, Nainital (ihp.pmu.chea@gmail.com)

Field Facilitation & Collaborators:
Prof. A.R. Nautiyal, HAPPRC
Dr. S.P. Sati, Geology Department
HNB Garhwal University, Srinagar (UK)

Credits:

Text: Drs GCS Negi, S Sharma
Photograph: Dr BS Adhikari
Design: Dr Subrat Sharma

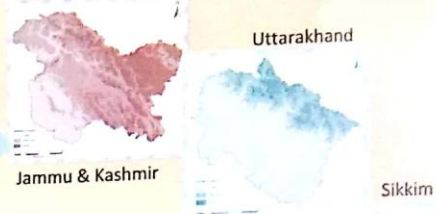


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Deliverable

Database and Knowledge Products

- Database on species richness along altitudinal gradient for the three Himalayan States, and mapping of Indian Himalayan Timberline
- Knowledge products on vegetation science of Timberlines
- Tree-soil water relations in Timberlines



Improved understanding of timberlines and models

- Depicted from thematic maps and database of timberline ecosystems as a special conservation entity and implication to sustainable management and livelihood enhancement
- Future changes in timberline *vis-a-vis* climate change and human uses
- Creation of climate-smart conservation models at the selected sites



Skill development on Conservation and Livelihoods

- Critical mass of expertise on timberline ecology developed
- Awareness and training material/ knowledge products for sustainable use of resources for improved livelihood of communities
- Training of communities on high value products (HVPs) development and conservation of timberline focusing on women groups
- Piloting of livelihood options on HVPs jointly with community in selected locations and value chain development
- Adaptation strategies for timberline developed and promoted with communities and local governments. Gender segregated analysis for women
- Citizen science on conservation of timberline zones

Policy Framework Development

- Policy framework on timberline conservation and development
- Policy advocacy on the framework initiated in three states and national level

Coordinator

Prof. S.P. Singh, FNA
CHEA, Nainital, Uttarakhand

Experts/Mentors

Dr PP Dhyani, GBPIHED, Kosi-Katarmal, Almora, Uttarakhand
Dr Eklabya Sharma, ICIMOD, Kathmandu (Nepal)
Dr GS Rawat, WII, Dehradun, Uttarakhand

Contact:

ihtp.pmu.chea@gmail.com
Tele-fax 05942-233099

