Proceedings

INTERNATIONAL MOUNTAIN DAY 2020
MOUNTAIN BIODIVERSITY

11 December
International
MOUNTAIN DAY

WEBINAR

Himalayan Mountain Biodiversity Threats & Solutions

December 10, 2020 | 14:30 – 17:45

BOTANICAL SURVEY OF INDIA
Sikkim Himalayan Regional Centre
Gangtok

सत्यमेव जयते

Webinar-cum-Brainstorming on
'Himalayan Mountain Biodiversity – Threats & Solutions'

Mountains host about half of world's Biodiversity hotspots and 30% of all Key Biodiversity Areas. More importantly, mountains are home to 15% of the world´s population. Mountains also provide freshwater to half of the humanity on earth for everyday life. Out of the 20 plants that supply world's food, 6 have centre of origin and diversity in the laps of the mountains.

The threat from climate change and overexploitation of these mountains result in the people dependent on these mountains for livelihood face unprecedented struggle in their day to day life and also the biodiversity.

This year the theme of International Mountain Day 2020 is Mountain biodiversity .

Introductory Address

Dr. Rajib Gogoi, Head of SHRC BSI Gangtok, acted as the Moderator and Convenor for the event, officially inaugurated the webinar with an introductory address

Inaugural Remarks

Director, Botanical Survey of India, Kolkata.

In his inaugural address, **Dr. A.A. Mao,** Director, BSI made a presentation on ***'Himalayan Biodiversity inventorisation, utilization and conservation special emphasis to Eastern Himalaya'***.

The presentation focused on the importance of Eastern Himalayas with emphasis to north-east states of India related to its rich floristic diversity, and the NE region being Vavilovian centre of origin of cultivated plants, Takhtajan's cradle of flowering plants.

A circular economy is an alternative to a traditional linear economy (make, use, dispose) in which we keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each service life.

The Bioresources of the NE region was discussed with emphasis on 'Circular Economy' was deliberated. The diversity, usage of Bamboos, Orchids, Ferns could pivot the 'Circular Economy' of the NE India to millions of dollars in Foreign Exchange. He also emphasised the different conservation measures taken up by different Government Agencies to protect the rare natural resources.

Panel presentation

Dr. R.S. Rawal, Director of GB Pant National institute of Himalayan Environment (NIHE) Almora

His topic for the event was ***Himalaya: Sustenance, Livelihood and Future prospects.'***

The emphasis was on Himalayan Biodiversity harnessing, higher biodiversity loss in Himalayas, significant loss due to global warming, complexity, and fragility, warming in Himalayas are more than global average. The Himalaya are connected to 4 other global biological diversity hotspots. Indian Himalayas host about 47% of flowering plants of India in 16% of land coverage. He presented a SWOT analysis of Himalayan Biodiversity. The

realisation that the Himalayas contribute to about Rs. 1000 billion per annum. There is a huge market for 'nutraceuticals', which could take input from traditional knowledge and these

Mighty Himalayas: Water tower of the world. 1.3 billion live down stream. 3 billion people benefit from food and energy. Forest ecosystem services worth Rs. 1000 billion/annuum.

species could be bought from wild to cultivation. Traditional crops enhance immunity; better suited for harsh climatic conditions and used for treatment of various ailments. Also, the non-farm sector in the Himalayas could get a boost from promoting Rural Tourism. He concluded by emphasising on building a network of young researchers and the Himalayan Knowledge Network.

Prof. (Dr.) P. K. Goswami Director, NEIAH (Ministry of AYUSH), Shillong. He spoke on the topic ***"Himalaya and Ayurveda: past, present and future prospects"*** The presentation explained the relationship between Himalaya & Ayurveda. Different classification

The Himalayan Ranges have medicinal plants translating to Ayush Drugs worth 350-450 million US$ of trade per annuum.

for Ayurveda (15 groups of drugs). Himalaya rich heritage of resources. Different group of drugs available and used. Present scenario of unscientific harvesting of medicinal plants. Standardization & supplying domestic Ayurveda industry and judicious use of resources.

Dr. A.A. Khuroo, Biodiversity & Taxonomy lab., Botany Department, University of Kashmir. He presented on "***Biodiversity of Western Himalaya emphasis on Jammu & Kashmir.*** He elaborated on the Biodiversity of western Himalayas : Jammu & Kashmir and emphasised on urgent action on biodiversity for

Genetic Diversity of cultivated plants very high in J&K: Apple has 190 cultivars, Apricots 45, Almond 20. Further 1123 medicinal plants, of which 31 species can be taken up on priority basis.

sustainable development western Himalaya. The habitat range from 113 to 8238 m in the Himalayas is another unique feature of Himalayas.

He revealed that biodiversity of the J&K has: Algae-1065 species , Bryophyte-420, mosses-328, liverwort-9, lichens-424, gymnosperms-41; angiosperms-5056 taxa (4778 species, 1306 genera, 180 families).

Dr. S.S. Dash, Head, Publication & Tech. Section, BSI-HQ, Kolkata has presented ***"Phytodiversity of Eastern Himalaya special emphasis to indicator species".*** The talk encompassed the entire Indian Himalayan Range (IHR) and it stressed out that the IHR has increasingly become highly fragile. This region with biological richness abound has been primary centre of speciation and therefore, a large number of endemics are present. The assessment of plant diversity in the IHR shows that the altitude between 2000–2500 m shows highest species richness.

2 species, Codonopsis benthamii and C. subsimplex have been rediscovered after 110 years and 49 years respectively. They show early flowering trends by about 8.28 & 4.36 days from the historical records. Therefore, these species are valuable indicator species of biodiversity change. The Indicator plants are integrable component of sustainable management. About 300 species of western Himalayas are assessed to be negatively correlated with temperature.

The species used to assess health of the ecosystem are called Indicator species, which serve also as early warning that a habitat is suffering. For landscape health, Balsams, Primulas, Rhododendrons, Orchids, Zingibers, Musa, Lichens are good indicators, while for soil, lithophytic orchids, aroids are good indicators. To assess biodiversity changes also,

these indicator species can utilised by studying their phenology, change in abundance, no. of threatened species, demography and distribution of a species.

Dr. Santhosh K. Shah, Senior Scientist (Dendrochronologist), Birbal Sahni Institute of Paleosciences, Lucknow. He presented on the topic "***Climate Change in Himalayan region based on proxy records.***"

The Third Pole: Climate change in Himalayas are to addressed swiftly because they are the source of 10 major Asian Rivers; driver of the strongest monsoon systems of the globe; largest reserve of ice outside the polar region; biodiversity hotspot; anthropologic diversity in culture, traditions and languages.

The Himalayan Region is warming more than the global average. The Hindu Kush Himalayas experienced a rise of about 1.3^0C during 1951–2014. This results in rapid melting of permanent snows and glaciers and Glacial lake outburst flood is becoming a common phenomenon.

The change is climate in the Himalayas can arrived by proxy records, such as tree rings, which gives high resolution proxy record and recombining past rainfall data using tree rings.

Dr. Chandan Tamuly, Head, CSIR-NEIST, Itanagar. He presented on the topic " ***Bioresources of North East India towards value addition***". This talk veered around circular economy, using the available bioresources and enhancing their marketability by value addition. Interestingly, *Wallichia oblongifolia*, locally called '*Tashe'* in Kurung Kumey and East Kameng district of Arunachal Pradesh are considered to be substitute for rice during time of scarcity and also used for medicinal purposes. *Zanthoxylum armatum* is also used as substitute for pepper. Mushroom cultivation and vermicomposting are other value added resources that are done.

Dr. Rajesh Joshi, Regional Head, G. B. Pant National Institute of Himalayan Environment (NIHE), Sikkim. He spoke on " ***Himalaya: Changing Scenario on Climate Change regimen".*** He elaborated on climate change scenario with special emphasis on Himalayas. That the temperature increase, disturbance in rainfall regimes are now more pronouncedly felt with increasing winter temperature, which could unsettle the water sources.

Dr. D.K. Agrawala, Senior Scientist (Orchidologist), BSI SHRC, Gangtok. His presentation was on the topic ***"Conservation and livelihood perspective of Himalayan Orchids".*** The diversity of orchids in the Indian Himalayas were presented. The rescue and rehabilitation of orchids from fallen/felled trees were elaborated. Reality check on the understanding of the diversity and value of orchid resources- threats, their market demands, the import of exotic species were the questions put forth to the stakeholders.

Less than 10 % of native orchid species used in floriculture industry. Orchid based community livelihood is very rare. Convergence of Research and Development funding on orchids, commercial importance of the species to be popularized and farmers to be encouraged to grow orchids along with promotion of nature tourism and value added product may be made available

Dr. Tapan Seal, Senior Scientist, Phyto-chemistry Section, BSI, Kolkata. His presentation was on ***"Ethnomedicine to Modern Medicine: Way to Drug Development".*** He discussed about the convergence of traditional wisdom and scientific techniques in developing drugs and nutraceuticals.

Wild consumable plants fill in as an essential constituent for the body with minerals, nutrients, hormone forerunners, protein while lessening the danger of malignant growth, coronary cardiovascular failure, and diabetes

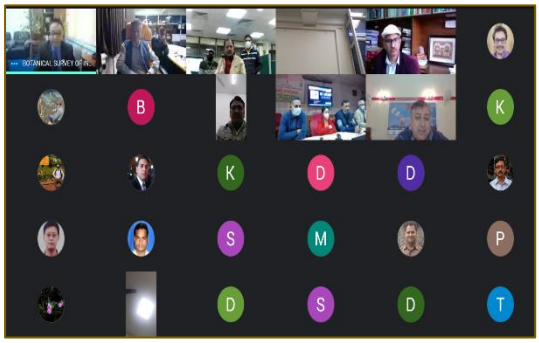
Way Forwad...

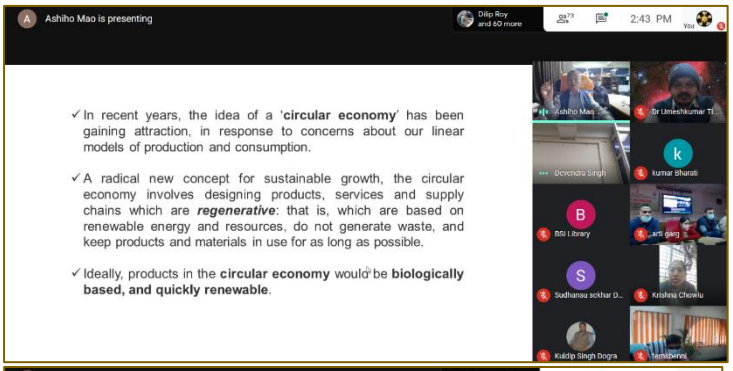
Webinar "Himalayan Mountain Biodiversity Threats & Solutions"

RECOMMENDATIONS

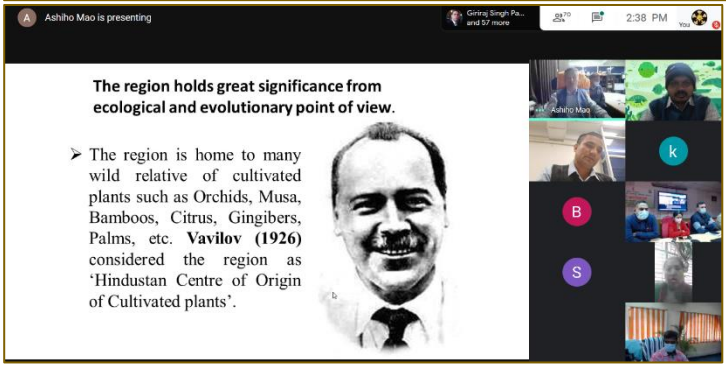
- The value addition to biodiversity enhances awareness, utilisation and conservation of biodiversity.
- Biodiversity studies are integral to the livelihood and sustenance of rural economy.
- Wild resources used in indigenous medical system to aim at sustainable practices of cultivation
- Nutraceuticals mining from the indigenous wild resources should be encouraged by exploring traditional knowledge along with scientific inputs to aid in product or drug development.
- The study of climate change is pivotal in understanding the changing scenario in the Himalayas and formulate adequate response to it.
- The role of Indicator species needs to be studied in a depth to understand the past, present and future emergent scenarios in the Himalayas.
- Sustainable utilisation of resources should generate value throughout the entire lifecycle thereby aiding in Circular Economy.

Webinar Screenshots

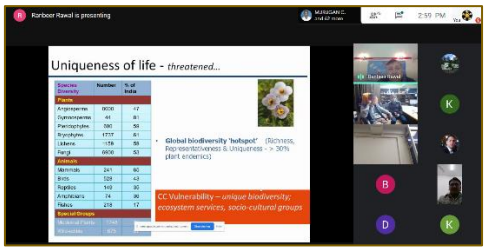




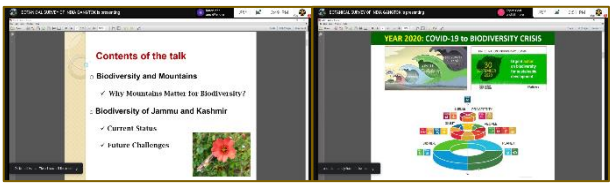
Dr. Rajib Gogoi, Scientist E & Head of Office, BSI, Sikkim Himalayan Regional Centre, Gangtok, welcoming the panellists and attendees to the webinar



Dr. A.A. Mao Director, Botanical Survey of India, Kolkata – **Inaugural Address**

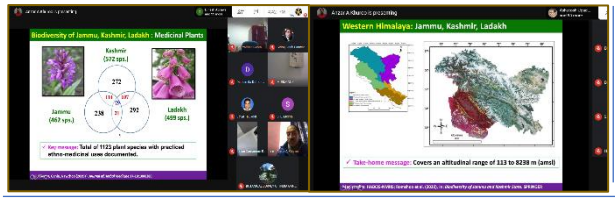


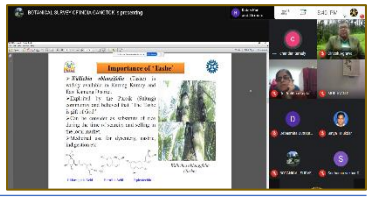
Dr. R.S. Rawal, Director,
GB Pant Institute, Almora
Chief Guest Address



Prof. (Dr.) A.A. Khuroo, University of J & K

Prof. (Dr.) P.K. Goswami,
Director, NEIAH Shillong
Address





Dr. Chandan Tamuly
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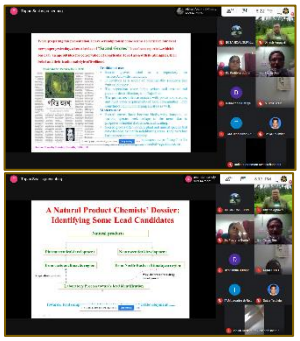
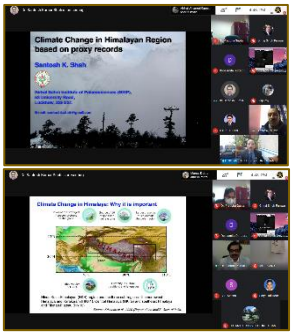
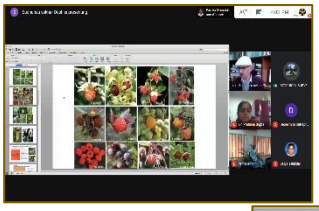
Itanagar

Dr. Tapan Seal
Sr. Scientist, Phyto-chemistry Section
BSI, Kolkata





Dr. Santhosh K. Shah,
Sr. Scientist
Birbal Sahni Institute of
Paleosciences, Lucknow



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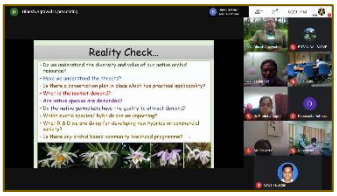

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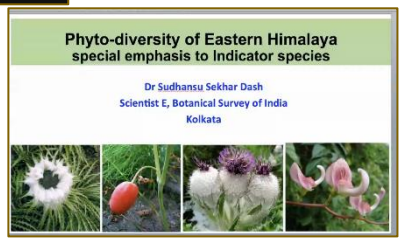

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