PROCEEDINGS OF MEET OF THE MOUNTAIN STATES

March 23 - 24, 2023

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New Delhi
Tenth Meet of the Mountain states (MoMs)
23-24 March 2023

Message from the President IMI

On behalf of all the Members and Governing Council of Integrated Mountain Initiative, I am happy to send a message of greetings to the entire Mountain community, and to the people of India who will be reading this report, now and in the future. This report captures the essence of the proceedings of Meet of the Mountain States held at the Paryavaran Bhawan complex in New Delhi on the 23rd - 24th March 2023. The objectives were:

1. To bring together researchers and policymakers on the identified themes and close the gap between science and policy praxis through collaborative dialogues, actions, and networking.
2. Synthesize recommendations of the mountain states to synergise and bring further clarity into the specific policies relevant for the mountains.
3. Create solution pathways for issues faced by the mountains and develop policy and research needed to address sustainability problems.

I am happy to say that the objectives have been met. We are now finding that there is greater clarity as to how policy makers can be engaged meaningfully ensuring science to the people connect through them.

The recent rains have brought untold misery to many of the Northern, Himalayan and Western India States. That there is now a real issue of disaster at every turn due to climate change is there for everyone to see. It is in this context that IMI will continue to ensure that we have dialogues on sustainability and building sustainable pathways using science with not just research institutions, but with stakeholders and Governments across the Himalaya.

We do hope that this report will contribute to the knowledge base on the Himalayan ecosystem and that both researchers and other stakeholders who read it in the future will find it useful. We have dealt with both Plastics and Millets as the core issues. The wider issue of Climate Change was a concurrent theme. The outputs are all documented in this report.

I am grateful to the Hon'ble Union Minister, Shri Bhupendra Yadav for making time to address the gathering. Hon'ble Minister of State for Environment, Shri Ashwini Kumar Chaubey and Hon'ble Minister of State for Defence, Shri Ajay Bhatt took time out to be with us at the inaugural. We are deeply grateful for their presence. They all shared their valuable insights with us from the political perspective which is so very important. We express deep sense of gratitude to Hon'ble Union Minister of State External Affairs, Shri Rajkumar Ranjan Singh and other Hon'ble MPs and Legislators for gracing the valedictory session and their insights.

Thanks are also due to Prof. Satheesh and his team at DCCC for collaborating with IMI on this very important event and part funding the same. Also, to all our guests and resource persons we have to say a big thank you for making our two days of MoMS a grand success.

PD Rai
President, IMI

Foreword

It has been an honor to support and co-organize the Meet of the Mountain States, 2023 at Paryavaran Bhawan, MoEFCC, New Delhi on March 23rd - 24th with the Integrated Mountain Initiative (IMI), and to have researchers and scientists from Divecha Centre for Climate Change (DCCC) present research findings, network and recommend policies and solutions to various stakeholders and policy makers through the two day deliberations held on Millets and Agroecology, discourses on One Health, Water Security, Glaciers and Waste Management in the Himalayas.

The impounding pressure on the carrying capacity of Planet Earth, with incidences and increased frequencies of Cloudbursts, Urban Heat Waves, Forest Fires, Glacial Lake Outburst Floods, Pandemics, Deforestation and the recorded decreasing number of extremely cold days especially in the Himalayas, puts immense pressure on the ecology of the Himalayas, on the region's glaciers, springs and other water reserves. Understanding the interlinkages between the climate variables and their impact on communities and ecology is crucial to mitigate these issues. The threat calls for action to repair our broken relationship with nature in order to build a sustainable world for all; and the MoMS has been an exceptional working action oriented platform that provides such opportunity for stakeholders and scientists to interact with participants, local communities and recommend supportive policy and governance mechanisms to various partners and policy makers at the local, national, and regional levels and usher in the changes needed to address the issues of the Himalayan region.

This report presents the two day discourse held during the MoMS and highlights the importance of sustaining the mountains and the need for science-policy and research to help solve mountain issues related to plastic pollution, climate change and on the need to reintroduce millets to the mainstream diets through nature sensitive agriculture and nature-based solutions. Understanding the interlinkages between the climate variables and their impact on communities and ecology is crucial to mitigate these issues.

I am optimistic as we have made a start and are ready for a long haul until our goal is realized. DCCC will continue to engage with IMI and the Indian Himalayan Region and we look forward to an Outcome Oriented Science-Solution-Policy dialogues with academic and non-academic stakeholders.

S. K. Satheesh
Chair, Divecha Centre for Climate Change,
Indian Institute of Science.

Background

Meet of Mountain States 2023 (MoMS) was organised by Integrated Mountain Initiative in collaboration with Divecha Center for Climate Change of the Indian Institute of Science and with support of Ministry of Environment, Forest and Climate Change (MoEFCC) at Paryavaran Bhawan, New Delhi on March 23 - 24, 2023.

Integrated Mountain Initiative (IMI) is a collective initiative for recognizing the value of mountain regions and enabling people to realise its potential by integrating the knowledge and experiences of multiple stakeholders. IMI has been working continuously on addressing cross- cutting issues related to climate change, mountain agriculture and livelihoods, disaster risk reduction and management, plastic waste management and sustainable mountain cities across the Indian Himalayan Region, which have posed adverse challenges to mountain development. IMI acknowledges the collective effort required for mountain agendas to be made more center stage, and to ensure support from governments – both at the centre and at the states. Its annual Sustainable Development Summits (SMDS) since 2011 followed by Meet of Mountain States (MoMS) therefore engages various stakeholders to come together and take part in an informed dialogue on themes of specific relevance to the mountain communities and regions of India.

These events bring together distinguished legislators, central and state government representatives, civil society organisations, practitioners, academicians, industry leaders, media and communities together to deep delve on issues of the mountains and to sensitise and advocate with national policymakers and practitioners. Events such as these increase the visibility and recognition of path breaking work by local people in the mountains, key issues and policy needs of the mountains, and reinforce the commitment of partnerships and collaborations between all stakeholders to take forward the cause of sustainability in the development of mountain regions.

Objective

1. To bring together researchers and policy makers on the identified themes and close the gap between science and policy praxis through collaborative dialogues, actions and networking.
2. Synthesise recommendations of the mountain states so as to synergise and bring further clarity into the specific policies relevant for the mountains.
3. Create solution pathways for issues faced by the mountains and develop policy and research needed to address the sustainability problems.

Thematic Discussions at MoMs, 2023

THEME I: Plastic Waste Management in the Himalaya- Pathways for EPR implementation

THEME II: Agro-ecology in Indian Himalayas: Resurgence with Millets

Welcome Address

Shri PD Rai, President Integrated Mountain Initiative

Shri PD Rai welcomed the elected representatives, key stakeholders, partners and delegates from the different states of the Indian Himalayan Region. He shared that MoMs was a space to inform policy makers and ministers with new knowledge and research that affect our mountains, and discuss key recommendations with relevant stakeholders. With MoMs being organised at the Paryavaran Bhavan, MoEFCC, he highlighted that it is at the heart of policy makers.

Shri Rai spoke on the importance of mountains and how IMI has been working for more than a decade to further the agenda of sustainable development in the Indian Himalayan Region. Mountains have special needs and therefore sensitivity towards these issues is very much required in the planning process. IMI captures all these challenges in their annual Sustainable Mountain Development Summit which is held in various mountain states. Shri Rai talked about the importance of the UN declaration of 'The International Year of Millets 2023' and how the IHR has millets to ensure food security. IMI's work on raising concerns about the plastic crisis in the mountains was also mentioned by Shri Rai and that the meeting would further be deliberating on it specifically on extended producer responsibility.

He hoped that the outcomes of MoMS would continue throughout the year and that the work would link with the Indo-Gangetic plains.

Overview of Divecha Center for Climate Change

Prof. SK Satheesh, Chair, Divecha Center for Climate Change

Prof. SK Satheesh gave an overview of Divecha Center for Climate Change, and that it works to link science and policies for sustainable development. Given the vulnerability of the Himalaya and how mountains would have a higher degree of warming than other parts of the planet, Prof Satheesh highlighted the need for the scientific community to help the people living in the Himalayan region through various research programmes. He highlighted some of the work that DCCC was already conducting in this front,

- The Future Earth which was a science policy programme bring social and climate scientists in the region to come together and exchange ideas.
- The Water Solutions laboratory working with the objective of linking water science with policy and this would impact mountain regions.
- Mapping and monitoring the snow and glacier changes in the entire Himalayan belt.

The knowledge generated would help in forming strategies for water management in the mountain region, he mentioned. He also mentioned the need to link various disciplines and asserted that there is a need for the scientific community to engage with the diverse decision makers in the government, private sector and civil society. The Divecha Center has been engaging with the IMI since 2017.

SMDSXI – Outcomes and recommendations

Shri Jigmet Takpa, PCCF/ President – Sustainable Development Forum of Ladakh

Shri Takpa, shared the outcomes and recommendations from the Sustainable Mountain Development Summit XI that was organised in Leh, Ladakh on October 9-12, 2022 on the theme of sustainable tourism for the mountains. The report highlighted the various thematic sessions from the summit which had an interesting and diverse lineup of speakers. Tourism was one of the main economic drivers for many of the mountain states, and the summit focused on discussing issues of culture and heritage conservation, biodiversity and environment, equity, among others, engaging policy makers and practitioners who brought in a wealth of experience.

Talking about sustainable tourism, he highlighted the intersection of protecting the environment, managing plastic pollution, supporting the local economy and providing authentic travel experience for tourists. He presented renewable resources that can be harnessed to support energy needs and would be a crucial part of eco-tourism. He mentioned that Ladakh was a case study, to research the everyday problems of mountain people. Climate change has caused catastrophic change in Ladakh in the form of loss of sheep due to unprecedented snowfall as well as loss of biodiversity. Ladakh faces the challenge of unregulated tourism too but also mentioned that tourism is a key livelihood option of many people.

He went on to mention Ladakh's potential for adventure tourism, homestays and Dark Sky Sanctuaries. He also mentioned cultural exchange between the homeowners and the tourists. He gave the example of Snow Leopards as part of successful tourism initiatives that promoted conservation too.

Implementing Extended Producer Responsibility in the mountains

Advocate Tashi Gyalson, CEC, Ladakh Autonomous Hill Development Council

Advocate Tashi Gyalson congratulated IMI on successful organisation of the SMDSXI in Ladakh, and the Mountain Legislators' Meet that discussed the issue of extended producer responsibility in the mountains. He highlighted the need for taking forward the conversation with relevant authorities for managing plastic waste in the mountains. "We feel cheated and taken for granted when corporates profit by selling their products but do not take responsibility for cleaning up their plastic waste from the mountains", he stated. Shri Gyalson reiterated that companies would have to do more for the mountains under the EPR regime. He also said that there is a need to understand how global issues related to climate change are addressed and how the way forward must be inclusive of all voices. He mentioned that the mountains are ecologically sensitive and come under protected area regimes and some of the restrictions that are imposed upon the mountain states are quite extraneous and unnecessary. He also expressed the need for bringing forward rural tourism as part of sustainable development initiatives.

Keynote Address

Challenges to Mountain Communities Under Changing Climate

Dr. Anil Kulkarni, Distinguished Visiting Scientist, DCCC

Professor Anil Kulkarni's keynote address largely focused on his experience of working on glaciers of the Ladakh and Karakoram Mountain ranges. He highlighted the importance of these glaciers as the water towers storing approximately 3236 gigatonnes, with the largest being in Indus, then Brahmaputra and Ganga basins. With almost 60% of its runoff coming from snow and glacial melt, the Indus Basin was seen as the most vulnerable to climate change and glacial melt, he mentioned. Dr. Kulkarni also mentioned that for Eastern Himalaya too, where rivers were fed mostly by monsoonal precipitations, climate change would have an impact.

Presenting on the dramatic changes in temperatures in the mountains, Dr. Kulkarni illustrated that during the 1950s and 1960s, the temperature change rate in the Himalaya was slightly lower than in the Indo-Gangetic plain, and that there has been increased warming from the 1980s. The Himalayan region has been warming much faster than peninsular India, and this can be seen in glacier response which is much more dramatic than earlier, he mentioned. Brahmaputra glaciers are retreating at a rate of 20 meters per year and are the fastest retreating glaciers in the Himalaya.

Dr. Kulkarni outlined the increased risk of glacial lakes bursting their banks and causing devastating flash floods to the downstream valleys, while also mentioning that modern technology had solutions to these problems such as lowering the lake's depth, using early warning systems. Life of mountain communities needed to be made safer by providing enough scientific input for policymakers to act upon, he stated.

The keynote also addressed the issue of increasing and early start of forest fire that mountain communities and ecosystems will likely face and the need to improve forest fire management strategies. Overall, the presentation highlighted the urgent need to acknowledge the major impacts likely to be brought by climate change, and the need for science to respond and fill in knowledge gaps.

Address from the Chief Guests

Shri Ashwini Kumar Choubey
Hon'ble Minister for State
MoEFCC

Chief Guest for the inaugural session, Shri Ashwini Chaubey in his address spoke about his connection with the mountains. While narrating about his personal family loss in the Kedarnath disaster in 2013, he highlighted the fragility of the mountains, and how disaster affects millions of people's lives. The need for a mountain lens in development as well as inclusion of the issue of disaster in the development discourse was highlighted in his speech. He emphasised the importance of the mountain states and stated that unless adequate development in the mountains does not take place, it would adversely affect the growth of the nation as a whole. He also mentioned how the mountain states have been introducing new policies to combat plastic pollution.

Shri Ajay Bhatt
Hon'ble Minister for State
Tourism

Shri Ajay Bhatt talked about MoMS being a rare occasion for the people of the mountains to voice their opinions and their problems, and even though there are differences in altitude where people live, there is a continuity of cultural connections. He highlighted mountain cities and spaces being prone to landslides and high resources required for the maintenance of the mountain cities. He expressed that disaster management is a very big task for those living in high mountains. He spoke of tourism being a major driver of development in mountain states even those in the border regions and high altitudes and has created social infrastructure reaching remote locations. At the same time, the concerns brought by the increasing tourism sector and its impacts were also highlighted.

Thematic Session I:

Plastic Waste Management - EPR implementation in the IHR

Chair: Shri Ram Muivah, MLA, Manipur

The session on "Plastic Waste Management - EPR Implementation in the IHR " focused on the challenges of implementing Extended Producer Responsibility (EPR) in the Indian Himalayan Region (IHR) for the effective management of plastic waste. The session had a wide range of stakeholders from policy makers to government officials, elected representatives and relevant organisations working on waste.

Plastic crisis in the Himalaya and the need for mountain sensitive policies - MLM 2021/22

Shri Roshan Rai, Councillor IMI and Member Zero Waste Himalaya

Shri Roshan Rai from IMI talked about the plastic crisis in the Himalaya and the need to have mountain-sensitive policies to respond to the geographical challenges of the mountains, as well as the importance and fragility of the Himalaya. He highlighted the need for a narrative shift from a 'management issue' to a systemic lens of production and consumption with producers of plastics taking responsibility for their waste. He said that the response to the waste crisis should not solely rest on consumer behavior. Only 9% of all plastic ever made has been recycled, and the dustbin and recycling narratives has led to the plastic pollution crisis that is manifested in micro and nano plastic spread including in human blood, lungs and placenta. Sharing the data from The Himalayan Cleanup 2022 waste audit data, it was highlighted that 70% of the plastic waste collected was non-recyclable and that over 80% of the waste came from food packaging. The brand audit data was also shared that named companies responsible for plastic pollution in the Himalaya and emphasized the need for these companies to take responsibility, including with the extended producer responsibility regime. He said that the issue of waste is not just a waste manager's issue, but a human, animal and planetary health one. He concluded by saying that IMI has come out with a policy brief for plastic waste management in the IHR.

Issues and challenges of EPR implementation in the Indian Himalayan Region

Waste Warriors, Shri Shashank Prabhu

Sh. Shashank, representing Waste Warriors, highlighted the challenges of implementing the current EPR regime in the mountains. He started by presenting the challenges of managing waste in the mountains citing an example of high altitude cleanups where the waste collected from the mountains have to be brought down with great difficulty and the resources needed for it. In terms of impact, Waste Warriors collected around 760 metric tons of waste from Himachal and Uttarakhand region in the year 2021 and 2022. He stated that tourists bring waste up into the mountains and leave most of it behind. This was also caused by the change in packaging material he mentioned. On the single use plastic bans, he mentioned that non woven polypropylene are being promoted with companies creating a narrative that these are cloth bags.

Sh. Shasank presented the key issues in EPR implementation in the mountains were :

- Lack of awareness at the local government level and an urgent need for building capacities of local government on EPR rules
- Poor collection coverage in rural areas, lack of processing infrastructure, and no material recovery facility to segregate and recycle waste.
- Higher cost of collecting in the mountains is not factored in - the brand owner and producers give 2 or 3 rupees per kg for EPR when the actual cost incurred is around 9.50 rupees per kg.
- EPR needs to be used for development of infrastructure, looking at higher per kg rates and more transparent policies that can be implemented on the ground and with clear role of local bodies in the implementation of EPR.
- The social cost of production must be considered (GHG emissions, health cost, waste management cost and mismanaged waste costs), and mentioned that the lifetime cost of the plastic produced in 2019 is more than India's GDP.

Shri Tikender Singh Panwar Ex Deputy Mayor - Shimla

Sh. Tikender Singh Panwar discussed the role of city governments in waste management and emphasized the need to address the flaws in the basic architecture in governing structures. He stated that local self government institutions are key to good waste management systems and their role must be acknowledged and given agency. They must be looked at as entrepreneurs and not just managers. Technology and capital intensive solutions like the establishment of waste-to-energy plants should not be given focus. He stressed the importance of institutional integration within local bodies and city governments and the need to strengthen institutional capacities. Political environment that promotes green initiatives like the Green Deal is much needed to improve waste management in cities. He mentioned examples like garbage dump fire in Kochi and Delhi, the Shimla Environmental Heritage Society, national conferences that led to the development of EPR. He stressed the need for empowered local self government institutions.

Shri RP Gurung, Zero Waste Himalaya and IMI

Shri Gurung presented the compilation of responses on the status of EPR implementation in the states provided by the State Pollution Control Boards who had been consulted prior to the MOMS through the state chapters of the IMI on the following -

Status of EPR implementation

Mizoram

- The EPR framework is new to the state and as such not implemented fully. The state government through concerned authorities like Mizoram Pollution Control Board, UDNPA department, ISOL Municipal Corporation etc is making much effort in this regard in terms of awareness and coordination with the producers and brand owners.
- Since EPR is relatively new to the state, it has not yet been implemented fully thus its effectiveness in plastic waste management cannot be measured.

Sikkim

- Meetings with the stakeholders, producers, brand owners and waste management agencies were conducted as soon as the first draft of EPR guidelines was brought out by the MoEFCC.
- Pharma industries including other industries operating in the state have been asked to register with the appropriate authorities. Notice on the same was brought out by the SPCB Sikkim.
- Initially the monitoring was to be undertaken by the respective SPCB, CPCB through an offline mode as per the CPCB SOP which totally relied on the documents, and periodic reports submitted by the waste management agencies engaged by the PIBOs to fulfill the EPR obligation.
- Reports submitted by the WMAs showed huge quantities of plastic waste were collected from Sikkim, particularly from areas under the jurisdiction of the Gangtok Municipal Corporation. Upon verification of the documents received by the SPCB, some gaps and irregularities were observed.
- This showed that the collection and channelisation of plastic waste are yet to be carried out in an effective manner under EPR.

Key issues and challenges

Mizoram

- Lack of infrastructure with no plastic waste collection centres or recyclers in the state.
- Waste needs to be transported to another state which requires extra transportation cost.
- No segregation at source which hinder the efforts of PIBOS in implementing the EPR
- Lack of awareness among consumers on the nature of plastic waste also causes problems in managing plastic waste.
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Sikkim

- Non-segregation of waste at source;
- Lack of infrastructure set up like mechanized material recovery facility, transfer stations, and community waste collection stations;
- Lack of plastic waste recycling facility and plastic waste processors;
- Financial benefits of the EPR regime not reaching staff at ULB's which are playing the key role in the waste collection from domestic institutions and commercial establishments;
- ULBs are not strengthened to perform the task necessary for successful Implementation of the EPR regime. The online EPR implementation mechanism in its present form is likely to create a situation where states are not equipped with segregated data that is sorted by private individuals working at landfill sites and ULB garbage collectors.
- Only high-value waste is being sold to scrap collectors, and the entire process is again being done by the unorganized sector.

Key recommendations

Mizoram

- Infrastructure development to support EPR. The informal sector segregates most of the plastic waste generated and is then sold to the buyer who transports to the recycler in another state.
- Lack of enforcement - There are challenges with monitoring and implementing the EPR and enforcing the rules, sanctions, and control. Even with a strong stringent implementation and monitoring system, there is a possibility of noncompliance of EPR from stakeholders as all the concerned authorities for enforcing the rules are understaffed.

Sikkim

- Setting up of recycling facility, and composting facility for compostable plastic in the state;
- Setting up of a network of MRFs in urban areas along with community waste receptacle stations;
- Resource recovery centers established in rural areas of the state to be brought into operation with the integration of their functioning with the WMAs and institutional scrap collecting agencies;
- Outsourcing of waste collection and treatment recycling disposal to private agencies under PP mode;
- Establishing a system of collection and channelisation of plastic waste by PIBO's either individually or collectively for regions that do not have easy access to recycling facility PWPS are given the level paying fee;
- Direct transfer of funds to ULB's in Hilly regions by PIBOs where they do not have a manufacturing base or areas not having recycling facilities on the basis of plastic waste collected, sorted and quantified for further processing.

Remarks from Central Pollution Control Board

Dr. Amit Love, Scientist E, MoEFCC

Dr. Love opened his comments by stating that environment protection was at the core of all of the notifications and rules under waste management including plastic waste. He mentioned that the amendment on phasing out of multilayered plastics in 2018 to allow energy recovery had ensured that these non recyclable plastics were being picked up in many states rather than just left in the environment. He stated that single use plastics culture was driven by consumer choices, and there needed to be a balance in government's decision-making to also consider consumer needs when promulgating the single use plastic ban with a list of 19 items.

Reflecting on the EPR guidelines, Dr. Love highlighted the specific provision of sustainable plastic packaging or in other words packaging designed for the environment which will bring forth the necessary changes to address plastic pollution. He talked about EPR being in its infancy stage and updated that till date around 6500 PIBOs covering nearly 2.32 million tons of plastic waste were registered. Guidelines were being developed and brought out and improved rapidly which would ensure that all producers, importers and brand owners align on a systematic basis by either shifting to alternative materials or reducing their plastic footprint.

Responding to an earlier comment, he also pointed out the differences between developed nations and India, stating that the per capita waste generation was much less in comparison to those countries, but the tendency to litter and improper management was leading to a challenging situation. The developed nations created much more waste, but they export it to other nations and not really solve it.

He mentioned that bans would work if these were consumer driven. Every citizen has the responsibility of reducing their waste and he gave the example of how most people had the habit of carrying their own bags which makes the ban on plastic bags more effective. He discussed the limitations of alternatives and that there were no perfect alternatives to plastic, though there have been significant developments. He cited examples of some innovative business models from Tamil Nadu on not allowing plastic bags to be used and a similar case study from Delhi's, Azadpur market, where strong measures are being taken. The demand for alternatives have to be created through citizen awareness, and then the economics would make sense once. citizens start to take up these alternatives.

He also talked about EPR being a market led approach and the demand for it had to be created. He cited that India is the net importer of newsprint but everything is collected and recycled (without any intervention of ULBs, faithfully from every household). Thus the same has to be thought through for EPR as it is nothing but putting in value to waste. EPR adds value to plastic waste and functions as an economics-driven viability grant funding.

Ms. Divya Sinha, Scientist F, MoEFCC

In August 2021, the Ministry of Environment, Forest and Climate Change (MoEFCC) in India issued a notification banning 19 single use plastic items in the country. The Central Pollution Control Board (CPCB) has taken steps to enforce the ban, such as cutting off the supply of plastic raw materials to producers and revoking their consents. This has resulted in a visible decrease in the availability of banned items.

However, some items that are considered essential, fall under Extended Producer Responsibility (EPR) and have not been banned and continue to be produced. The EPR covers single-use plastic items and plastic packaging, and the manufacturers of these essential items are complying with it. Other non-essential items have been banned, and their licenses have been canceled. The remaining items in circulation are suspected to be manufactured and distributed clandestinely without formal permission from state boards. Measures are being taken to address this issue and prevent the circulation of such items.

There are several alternatives available, including certified compostable plastics and agro-based raw materials for manufacturing single-use plastic items. To completely replace plastic usage in the economy, both the government and citizens need to cooperate and scale up the production and usage of these alternatives.

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Open house session

Moderated by Shri Jigmet Takpa (IFS) PCCF Ladakh

During the Q&A session, there were discussions about the effectiveness of EPR and the need for policy amendments.

Participants mentioned that EPR needed to also look at production and material as well, to make space for innovative material which is biodegradable and eco-friendly.

Shri Biju Negi questioned the effectiveness of alternatives and whether there were any studies conducted on the topic.

Dr. Rajan Kotru highlighted the growth in population in the Himalaya, and that local plans did not take the escalating numbers into account, and that citizen responsibility towards waste management also needed to be fixed.

Shri S.S. Kandpal, APCCF, Arunachal Pradesh talked about the failure in segregation, and that capacities of local bodies, waste workers had also not been enhanced, which is crucial for proper waste management.

Shri R.P. Gurung stated that the producer companies are passing on the responsibility of plastic waste to consumers, and even if all individuals took responsibility the problem would not be solved in its entirety. Mentioning the amendment in phasing out of multilayered plastics, which is one of the most evident visible pieces of waste in the mountains, he asked CPCB officials if there are possibilities of phasing out multi layer plastic from at least the mountains in a phased manner.




Closing remarks

Shri Ram Muivah, MLA, Manipur

The session chair complimented all the panelists' views and added that unless institutions are strengthened, democracy cannot be strengthened and be useful. He summarized the talks and placed the concerns of solid and plastic waste management faced by the North East.

Summarising the sessions, the chair made a mention that single use plastic ban in Manipur was successful. He also reiterated the challenges of the mountains due to difficult terrain, high cost of logistics and lack of processing infrastructure. He agreed that centralized solutions that were consultant driven were faulty, and an integrated approach through institutional strengthening was missing. He ended by stating most North East towns were making mountains of plastic waste, and there was a desperate need to work on solid waste management.

Thematic Session II:

Agroecology in Indian Himalayas 'Resurgence with Millets

Chair: Dr. GS Rawat, Vice-Chairman, SDFU and Former Dean, WII

Millets and other pseudo cereals have long been overshadowed in the agriculture development of India, especially in the mountains. In the last few years, however, the Government of India has taken positive steps to promote millets.

Inaugural Address

Shri Nek Ram Sharma, Padmashree

बीज हमें जो मिले थे पुरखों से
उनकी कदर न की हमने
मौसम की मार झेलने की क्षमता थी उनमें
कदर न करी हमने।
दाना सभी का बारीक
मगर नाम उनको मिला मोटा
पौष्टिकता मे था ये भरपूर
रोगों का भी झझंट ना होता
घास वर्गीय है ये प्रजाति
बिना बीजे भी खुद उग जाती
चीटीं चिड़िया का भी भोजन
मानव को भी निरोग बनाती
खोड़ा कोड़ी चीरन भरोसा
बढ़ता सभी मक्की दालों के साथ
बदल-बदल कर रसोई में नित प्रतिदिन बनता
कभी न होता हृदय घाट
ऋषियों ने दी थी हमें यह सौगात
मगर हमने खाया सिर्फ गेहूं और भात
पंचतत्वों के शरीर की
भोजन ही है औषधि
ठीक से खाना पचायें शरीर देगा साथ।
अठारह अनाजों की खेती सालभर में होती
नव आज
दलहन ही राम मिश्रित खेती
रसायन मुक्त मिट्टी बलवान होती
बिना भुख के कभी ना खाए
आंत की दुर्दशा न बनांए
व्रत और उपवास भी करते रहे
शरीर को अदंर से भी सजांएं

Shri Nek Ram Sharma's inaugural talk highlighted the fact that a number of problems and disputes have been caused by overgrazing and forest fires in the mountain regions. The solution to tackle this problem is through seed sowing and plantation. In addition, hydropower and other anti-nature and unscientific actions have been creating issues in the agricultural system which require more focus and action. The negative consequences of over-development are due to manmade cause which are however declared as natural calamity when any disaster occurs.

Sh. Nek Ram Sharma emphasized the fact that millets are a part of our culture and are not just food but medicines and immunity boosters to mankind. For example, the high calcium content in finger millet treats calcium deficiency while foxtail millet contains a potential anti-toxin for chickenpox. In addition to the health benefits, millets are highly advantageous to farmers due to their low water requirements, drought tolerance, pest resistance and their employment in multi-cropping systems.

Sh. Nek Ram Sharma encourages millet consumption by organizing training for preparation of various food products from millets such as tea.

He stressed upon sharing awareness about the millet knowledge among the local people.

Millets and their role in nutrition and livelihoods

Dr. Dayakar Rao, Principal Scientist and CEO, IIMR-Hyderabad

Millets are seeded grasses and approximately nine types of millets are being propagated in India. In addition to these, varieties like Job's tears have been cultivated in the North-eastern region of India which needs to be brought into limelight. In 2018, millets have been renamed as nutri-cereals along with other cereals such as buckwheat and amaranth. The Government of India has referred to millets as 'Shree Anna'. Millets are also referred to as "smart food" due to their numerous nutritional and health benefits and agro economic traits.

He emphasized on "Low water foot prints and low carbon footprints". Apart from incorporating them as foods in our diet, alcoholic beverages from millets are being prepared and consumed mostly in North-Eastern India.

India is the largest millet producer, producing about 20 million tons of millets out of 90 million tons and the 5th largest exporter of millets. bajra and ragi constitute 95% of the millet production and area. China, Nigeria, Sudan and Ethiopia are other millet consuming countries. Two exotic millets, teff and fonio are being cultivated in Africa. America, Australia and European countries lack the knowledge of millets and initiatives to popularize millets in such countries is necessary leading to global food security.

Millets are richly bestowed with micronutrients like zinc, magnesium, calcium, B-complex vitamins. and offer solutions in reducing the global hunger index, malnutrition and lifestyle diseases and micronutrient deficiencies.

Major problems related to millet revival can be overcomed by increasing the demands of farmers, diversification of processing technologies and generation of clinical and science related data. An oath to include millets in our diet was take- Lets Millet.

Key recommendations

- Include millets in programs and projects
- Support conservation and seed exchange
- Recognition, promotion and diversification of millets
- Promote nutritional friendly packaging solutions
- Strengthen collection
- Millet recipe documentation
- Promote startups through funds and grants

In the interactive session, it was mentioned that 30 FPOs were working across various states on millet processing and value addition. In terms of financial sustainability, making millets a remunerative crop was very important and Governments of Orissa, Karnataka, Chhattisgarh, Rajasthan, Tamil Nadu, Uttarakhand were adopting various millet missions and provision of incentives. Some states were also implementing ICDS and midday meal programs which could also be tried in Northeastern states. On the issue of technology it was mentioned that while there were no machines for processing a few years back, the situation had changed with technology being available though access was still a challenge.

Underexploited/Forgotten Traditional Food crops: A resource for Sustainable livelihoods of the Himalayan communities

Dr. Vinod Bhatt Ingenious Research & Development Foundation, Dehradun

Dr. Vinod Bhat began by stressing on the fact that migration of mankind to cities for employment opportunities has become a major reason for agricultural crisis and this needs to be addressed at the earliest. He also explained how language has been used to push millets to the fringe like the term kala anaj used to describe millets. He also highlighted the importance of millets and mentioned that millets are one of the oldest foods and have been mentioned in Vedas. Millets being local crops are climate resilient and contribute to sustainable livelihood. He explained the four types of cropping systems. 90% of the world's nutrition is based on 30 production crops, earlier it was 500. The 'Barahnaja' system is disappearing. After the COVID pandemic, people have become more conscious about food selection. Amaranth/Ramana. Chenopodium(Bathwa) are some of the important crops which should be considered in the millets category. He mentioned Amaranth as "Super smart food" by explaining its benefits such as twice as much protein than wheat. More focus on marketing millets and government policies are required.

Millets and their importance in agroecology in Indian Himalayas

Dr. Rohini Mattoo, Scientist, IISc

Dr. Mattoo started by emphasising the renewed interest on millet cultivation and promotion with the year 2023 being International Year of Millets. Her presentation reflected on how millets improve agroecology, nutritional and food security in the Himalaya. Millets improve the environment through nitrogen fixation, nutrient solubilization, drought tolerance, salinity tolerance and remediation of poor soils. Millets employed in agricultural practices such as intercropping, crop rotation, companion crop leads to better land use efficiency. Millets cropping also contribute to SDGs by checking run off water and less nutrient loss, better ecosystem functions, are pest resistance and provide food and nutritional security providing income for small farmers.

Millets can adapt to different soil pH and high altitudes and hence are favorable for the landscape of the Himalayan region consisting of diverse soil types and different pH. Agronomic traits such as insect resistance, pollination enhancement and their use as animal fodder and bird feed contribute to the agroecology of plains and the Himalayan mountains.

Dr Rohini Mattoo highlighted that it is a challenge to enhance cultivation in a sustainable manner for a wider acceptance at a global level. She recommended the introduction of blast varieties of millets in mountains. She also spotlighted the work on food security at Divecha Centre for Climate Change regarding microbiome of finger millets using next generation techniques and interdisciplinary research. Further studies will continue to explore other sustainable solutions for synthetic fertilizers and the results would expand knowledge of fundamental science and be highly beneficial for applied research.

Agri-business with Millets in the Hills

Shri Arun Acharya Consultant (IISc)

Arun Acharya focused mostly on “Agribusiness”. “The way of agribusiness is a business”. He stressed on the fact that youths have out migrated to urban areas and abroad resulting in lower crop cultivation. Millet was a staple food of the hills but after the Green Revolution in 1960s and 1970s, high yielding seed varieties and agrochemicals, excessive irrigation practices has caused climate change and change in food habits and going back to millets is necessary. He considered millets as a staple food of the hills. Millet eaters were the best studious people.

Key recommendations

- Focusing on remuneration as it is the only way to encourage millet production and consumption.
- Focusing on marketing of millets (Millets are mostly being marketed in the urban side).
- Gaining knowledge on health benefits through observational and clinical trials.
- Not neglecting the side effects of overconsumption of millets. For example, overconsumption of foxtail millet causes goiter and inhibits thyroid hormones.

Technology Intervention for high productivity: A case study in Ladakh

Dr. Sandipan Mukherjee Scientist, Ladakh Region, GBPNIHE

Dr. Mukherjee’s presentation was based on simple rural agro ecological technologies for livelihood improvement in Ladakh (Trans Himalayas). He emphasized that a major issue in Ladakh is no/less access to vegetables and the reliance on importing from different parts of the country. This could be addressed through implementation of newer techniques like

- Low-cost portable polyhouse- This technique utilizes iron bars, wooden poles 300 GSM polycarbonate which reduces the cost by almost 10 times compared to the traditional polyhouses. Integrated mushroom cultivation and intensive vegetable cultivation has been targeted.
- Low-cost solar powered hydroponic system consisting of a nutrient reserve and solar power generating system. Fruity vegetables (tomatoes, cucumber), leafy vegetables (lettuce) and vegetables for culinary use (beans) are being targeted within this system.
- Winter floriculture can also provide employment opportunities for local people.

The input cost analysis and market has been carried out and in the coming future, these technologies can be upscaled to the villages in Ladakh.

Voices from the Grassroots

Shri Vijay Jardhari, Beech Bachao Andolan

Shri Vijay Jardhari started with the history of the transformation of agricultural practices which harmed in a negative way (i.e. use of chemical seeds, excessive use of fertilizers). In urban culture, millets are known as “mota anaj”. He stressed upon calling millets ``Poshtic Anaj” and “Kadan Pahal yojana”. It should not be called “Mota Anaj'' instead of that the millets should be known by their original name i.e. Bara Anaj, Ram Dana, bhangy, jhangora etc. He gave the statement- “Beej Ek Anmol Dharohar Hai Beej Bachakar Rakhna Hai ''. From a climate change perspective, he said don’t see the hills as hills but as the sources, from where the river is coming, resources are coming. At last, everything can be done in the mountains, he specifically said “start anything from your side first, Har Ache kaam ki shuruwat apne se karni chahiye”.

He urged for help to protect their farming lands from the wild animals. He concluded by stating that Citizens must bring change, government can only make policies following it is the duty of the citizen. therefore, both citizens and governments have important roles to play in creating positive change.

Ms. Alethea Kordor Lyngdoh, NESFAS

Belonging to the Khasi Indigenous group from Meghalaya, Alathea represented NESFAS and NEN, talking about reviving, defending and promoting Millet which is an Indigenous Peoples’ heritage of Meghalaya and Nagaland. Only two households cultivated millet in a village in Meghalaya - Nongtraw Village in 2010 and an indigenous food festival that was held paved the path for the revival of millets, along with other traditional crops.

With the Public Distribution System (PDS) making rice available to every household, millets were replaced by rice as the local staple for most communities in the 90s. The local custodian farmers in certain regions continued to safeguard this crop despite the transition. This enabled the journey to defend, revive and promote millets.

Agroecology Learning Circles (ALCs) are important institutions that bring together people for knowledge transfer and participatory development. ALCs facilitate the exchange of seeds between villages and the revival of traditional practices like labor exchange. They also helped communities impacted by heavy rains to share millet saplings. ALCs support school gardens, such as growing millet in Nongwah and incorporating it into midday meals in Laitsohpliah. ALC groups in Mynriah are working on reducing pest infestations with biopesticides. Local and contemporary knowledge is blended together to create healthy and glamorous food, with a recent collaboration involving a well-known chef focusing on millet revival. The communities' knowledge plays an important role in the entire process. She shared a slogan called ‘No Woman No Krai’. Krai means millet in khasi which they started 10 years ago.

Shri Bishnu Chettri Krishak Kalyan Sangathan

Shri Bishnu Chettri started his talk by introducing his organization named "Farmer's Federation" which started in 2005 in Kalimpong. The major focus of the organization is millet. He shared the statement-"Jo millet khata hai wohi warrior ban sakta hai" which is stated in his community and region. In 2015 he tried to take millet into the market and farmer producer company started with low prices for the millet. To date, 1500 farmers have joined the company. Farmers' profit is the major goal and the federation has been consistently making profit. He stressed that the company is embraced by the women. He also highlighted how the whole farm is based on women without women farming will not exist. Yet, nutrition deficiency is seen in women the most. He mentioned the slogan of his organization- "Of the Farmers, For the Framers and By the Farmers".

PANEL DISCUSSION

Gaps in Science, Policy, Practice in Agro Ecology in IHR

Moderator: Ms. Binita Shah

Shri PD Rai

Shri Biju Negi

Shri Rajan Kotru

Shri Amba Jamir

Shri Rajan Kotru

Shri Rajan Kotru referred to a study conducted at the European Union in 2010 that reported a 47% reduction in greenhouse gas emissions with the incorporation of agroecology in the agricultural system. He insisted that science needs to be active and capture on studies like these and the knowledge and ideologies of Shri Nek Ram and Shri Bijay Negi regarding millet production and consumption.

The scientists looking into ecosystems of the Himalaya have mostly focussed on provisioning services and regulatory services. More focus is required on cultural services as they are completely linked to the interface between man and nature and the best way of seeing the man and nature connection is by agriculture.He also mentioned that we are fighting a war against conventional agriculture. On one hand 316 billion rupees of pesticides will be used in India by 2024 and about 2.5 lakh crore of subsidies are being given on chemical fertilizers while on the other hand people are talking about agroecology which does not fit together. Thus, science has to be awakened to give the policymakers the evidence which forces them to change certain measures.

Along with policies and framework, a Himalayan Agroecology strategy should be planned that makes inventory on the best practices that are available today. Once the list of resource people and places which he referred to as green spots (instead of hotspots) is captured, the policymakers must be passed on the knowledge of how robust and how tangible or intangible the whole system is in terms of quality and also in terms of the current trend switching over to organic and natural farming.

He also insisted on sketching a business plan that not only considers resource people and green spots but also agri business model that involves branding and consumer attention. A multistakeholder forum at the policy level is also necessary because agroecology is not only based on agriculture in the Himalayas but also other factors such as the landscape.
Finally, he concluded by saying that we will have to produce more, on less land in the Himalaya in the coming years.

Shri PD Rai IMI

He mentioned that post COVID, there has been a surge in looking at food as medicine very seriously. He related his personal experience post COVID, after a bit of research he added millets and more greens to his diet, and saw a gradual change in his physiology losing almost 10 kgs of weight with increased energy levels . After being on this diet, he mentioned his insulin dependency was cut down and he further aims to bring this medication intake to a minimum. With a balanced diet of the right nutrients, one does not need supplements as food will do the job of this.

Shri Amba Jamir, IMI

He mentioned that there is research on the plant's (millet) physiology, nutrition, etc but there is no research in the field of policy planning, development and implementation and this was where the gap lies. The academic research is not feeding into policies. Considering it is the year of the millet, it is noticed that governments are pushing schemes to promote millet, but there was a need for studying consumer habit and preferences, so that the millets produced within a state are consumed within the local economy. There is no point of exporting to other areas when we really need to ensure that the millets are consumed locally.

There is less/limited institutional support for research and for farmers. Institutional support in terms of financial services, marketing services, access to knowledge, to resources for the people that are growing millets. There is a mismatch between what is happening on the ground and the lack of institutional support. There is insufficient funding for not only farmers but potential researchers.

Shri Biju Negi, Beech Bachao Andolan

The talk by Shri Negi started with the remembrance of two famous personalities, PV Satish who is known for millet promotion in South India and Bhagat Singh who supported farmers. We have policies (niti) but not scheme/plan (yojana).

He urged that we must stop calling it millet and call it by its vernacular/original name citing the example of basmati so that it occupies it rightful place in the socio-ecology. The revival of such cereals is very important for the society and can be achieved through various ways, one of them being the celebration of festivals related to agriculture.

Comments and Suggestions

- Shri Sushil Ramola suggested the idea of agri entrepreneurship which would help young farmers or youth to take up farming with a link to policy makers. He mentioned that a holistic approach to millets that went beyond romanticization, and approach should not only be top down. In a viable and sustainable economy, millets need to find their own feet.

- Dr. Vincent Darlong highlighted larger issues related to farming such as shifting to cash crops from food crops, land tenures. Looking at it through the lens of the north east - he highlighted the practise of jhum cultivation. Currently, there is a competition for land use - there is the national horticulture mission, there is rubber board, tea board, oil palms which are all promoting their own products. Given this situation Dr. Darlong questioned, “Where will you grow millet, where will we grow our food crops?”. He stated that this is something that needs to be addressed at the community level and the local government level. This is because most of the land in the north east except in Tripura, are owned by the community. Therefore, unless there is limited suitable land for food crops, and practice agro-ecology, where we can grow millets, it will not work.

- Shri Tikender Panwar asked about the hybrid seeds which are genetically modified and it contradicts with what Dr. Sharma has presented, which does not allow seed saving at the farmer level. Like wheat, why should we not have proactive state support for millet in terms of market intervention.

Closing remarks

Dr. GS Rawat, Vice-Chairman, SDFU

Dr.GS Rawat thanked all the panelists and the speakers from the grassroots and asked them to prepare a presentation for the 2nd day so that the outcomes and deliberations could be placed to the Minister, GOI. He stressed that we must prepare a clear-cut road map and few proposals on what way we could add value to the outcomes of the discussion. He suggested the possibility of a research proposal from the IMI side that could be submitted to the Hon'ble Minister, MoEFCC.

Science, Policy and Practice gaps and mapping the various areas especially on agro-climatic regions and traditional knowledge could be the focus.

Release of the report of SMDSXI

Shri Jigmet Takpa, PCCF/ President – Sustainable Development Forum of Ladakh

The SMDS XI report was released on the second day of the Meet of the Mountain States. SMDSXI was held in Ladakh from October 9-12 in Leh on the theme “Harnessing Tourism for Sustainable Mountain Development”. The report highlighted the outcomes from the various sessions -

- Tourism products for mountains, good practices, and pitfalls.
- Incentives, inclusive society, and cultural values.
- Eco-restoration and carbon neutrality for sustaining a high altitude environment.
- Sustainability and national security.

The proceedings of the Indian Himalayan Youth Summit V on the theme entrepreneurship in the Himalaya was also part of the report which includes the Leh Declaration adopted by the youth delegates.

Presentation and release of DCCC Coffee Table Booklet & Future Earth 10NICS Report

Dr. Smriti Basnett,
Future Earth, DCCC

Future Earth is a network of scientists, researchers and innovators designed to provide the knowledge needed to support transformation towards sustainability. Future Earth was officially announced in June 2012 at the UN Conference on Sustainable Development Rio, to be created as a global initiative to strengthen the interface between policy and science and to repair a broken relationship with nature in order to build a sustainable and equitable world for all.
Future Earth supports 27 global research networks that explore the interaction among humans and the planets, land, air, water, and biodiversity. It engages with low- and middle-income countries. It engages with early career professionals from a range of disciplines and sectors. And the support for these engagements is provided by a distributed network of five old secretariats based in Canada, France, Japan, Sweden, USA and three new Global secretariat hubs based in Africa, China, and India. These hubs function as a single entity with well-defined roles for each secretariat.

Together, Future Earth builds and mobilizes a network. These networks link policy, business, and civil leaders with researchers to address themes like water, energy, food, Nexus, global mountain biodiversity assessment, one health, urbanization, natural assets, and more.

Future Earth shapes the narratives, helps incorporate the latest science into global decision-making, and engages in conversations on sustainability solutions. For instance, the 10 New Insight into Climate Science report is one such report that has been launched at every COP alongside the UN Climate chief since 2017. 65 researchers from 23 countries prepared the 10 New Insights into Climate Science Report 2022 and delivered essential research findings for Policy Guidance to Informed Decisions. The same was presented to the honorable delegates and participants.

With the transition of Future Earth in 2019, realizing the need for a future Earth community in the Global South and after acceptance of a bid proposed by the Divecha Centre for Climate Change, a South Asia Global Hub was established at the Indian Institute of Science. Major secretariat roles related to global science communication, IT support, and capacity building with the roles of regional networking with SAARC countries, Myanmar and Indian Ocean Island countries of Mauritius, a global hub South Asia Regional Program on Tackling Malnutrition, Coastal Risk is being established at the Divecha Centre for Climate Change.

Professor Satheesh, Director of the global hub South Asia presented the Future Earth Coffee Table booklet to the Honourable Minister for release. The booklet reflects the past activities carried by Future Earth Regional Office, which has now transitioned into a global hub.

Presentations on the thematic discussions of Day 1

THEME I: PLASTIC WASTE MANAGEMENT - EPR IMPLEMENTATION IN THE IHR

Roshan Rai, Councilor IMI

Extended producer responsibility in the IHR - Current status

- Implementation of EPR is limited and not functional especially in the North East states.
- Limited understanding and awareness of EPR within ULB, PRI and People- EPR has a complicated mechanism and is highly centralised
- Infrastructure for waste management is limited in the IHR states and segregation at source is not taking place making it challenging for EPR implementation
- Linkage to recycling and processing is poor in the IHR and extremely challenging in the North East states limiting EPR implementation.
- Non compliance and even irregularity of reporting in EPR by WMAs were presented
- Only high value plastics are collected leaving out MLPs and Tetrapak in the environment
- SPCB, ULB, PRI and other stakeholders convergence is limited

What is needed?

- Acknowledgement that mountains need special focus in terms of policy sensitivity and resource allocation..
- Revisiting the EPR framework with a mountain lens (setting up a task force/ committee/ round tables)

- EPR targets for companies that are mountain specific.
- Industry within the states should fulfill their targets from within state
- EPR rates to be made viable considering the ecological importance, fragility and geography of IHR
- Invest in processing Infrastructure (MRFs/ PWPs)

- Awareness and build capacities of ULB and PRIs to implement EPR
- ULB and PRI made more inclusive stakeholders of EPR
- Strengthen coverage of rural areas

THEME II: AGROECOLOGY IN THE HIMALAYAN REGION 'RESURGENCE WITH MILLETS'

Dr. G S Rawat, Vice President SDFU

- Himalayan regions are one of the highest diversity areas as far as agriculture and traditional crops are concerned since there are 12 crop varieties in the Indian region and 5 of them are located in Himalayan region which are largely organic.
- Traditionally in the Himalayan regions mixed cropping systems are practiced. Millets, cereals,pulses are an integral part of agriculture.
- Women have been the backbone of agriculture in the hills. He gave the example highlighted speaker Ms. Alethea Kordor Lyngdoh from Meghalaya - "if there is no woman, there is no Krai".(Krai is millet in Khasi)
- Farming is the important socio-cultural and community based activity which is closely linked with festivals, songs and rituals from birth to death.

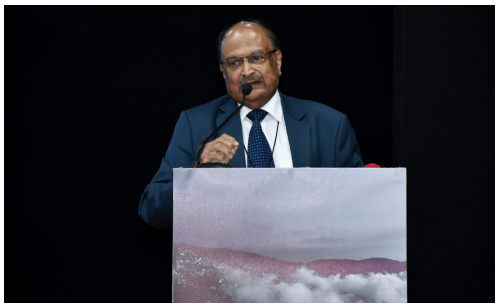
- He also highlighted some of the major key issues from the discussion.
  - Rapid decline in local millets and crop varieties
  - Rapid decline in the net area of farming. Many parts are abandoned by people due to migration. As a result those places have turned into ghost towns.
  - Non availability of seeds holding and competing nature of human in agriculture.
  - Lack of incentives and interest in agriculture among the young generation because of the other interests and lack of knowledge.
  - Crop damage by wildlife and pest in many parts of Himalayan region.
  - Lack of technical backstopping and policy support.

- In conclusion, summarized recommendations emerging from the discussions were presented.
  - **Need to adopt a holistic approach to farming for the conservation of agro-biodiversity through institutional and policy support.**
  - **Need to take initiative from agro-entrepreneurship and farmer's federation.**
  - **Identify gaps in science policy and practices. Document a traditional knowledge on different farming systems. Form Himalayan agro-ecological strategies. Identify map and green pocket areas of traditional crop varieties and revive them.**
  - **Establish seed banks and exchange programmes in agro-climatic criteria.**

Special session with Divecha Center for Climate Change

“Reflection, Opportunities for Innovation and Collaboration between DCCC and IMI”

Moderator: Mr. Sushil Ramola, Former President, IMI



Invited speakers from Divecha Centre for Climate Change presented the research on glaciers, one health and millets and included keynote talk by Professor Anil Kulkarni on the ‘Challenges to mountain communities under changing climate’;

Co-notes were presented by Dr. H Paramesh who emphasized on the need to engage with local communities and healthcare providers in the development of sustainable healthcare systems;

Dr Rohini Mattoo reiterated the importance of agroecology in Indian Himalayas with an emphasis on the gluten free and calcium rich property of millets, its long shelf life of 5 years, and an adaptive food crop that can sustain on varying soil including high-altitude climate.

Dr Smriti Basnett on behalf of DCCC expressed the need for further collaboration with continued efforts between IMI and DCCC through a three-year road map, to build on the Science-Solution-Policy dialogues and plan activities that will look into science-policy and involve researchers and policy analyst from DCCC to create solution pathways and recommend policies for the Indian Himalayan Region on the topics discussed at various annual Sustainable Development Mountain Summits (SMDS).

Reflections from Legislators/ Policy makers

Moderated by Shri PD Rai, President IMI

Shri Ram Muivah, MLA, Manipur

- EPR session was important to have agreement on the responsibility of the producers, generator and manufacturer of plastics.
- Producers should take responsibility for establishing management units in all the district headquarters, if possible.
- Suggestions for banning problematic plastics due to the challenges faced by the people working on waste management needs to be considered.
- Himalayan Declaration to incorporate some good practices and suggestions.
- Millets as a fermented food was a part of tradition in ancient times. In Nagaland, it was probably due to the consumption of millets that ancestors had an average height of about 5 '11 which was comparatively more than the average height of man today reflecting the strength and vigor of millets. During the 19th century, a number of foreign missionaries from Scotland, USA, UK, etc promoted in Nagaland prohibited the consumption of millets. However, its revival is of utmost importance.
- Because millets are mostly cultivated by small farmers in villages support from the Government of India in terms of incentives and subsidies is needed

Shri Sonam T. Venchunpa, MLA, Sikkim

- There are limited solutions for the plastic waste in the hills.
- Alternative of plastic must be promoted and and there must be some research going on in some laboratories in our country that needs to be brought to the mountains.
- Sikkim was a frontrunner in banning single use plastic, and water bottles below 2 liters.
- Local governing councils in North Sikkim (Lachen and Lachung) had also banned tourists from bringing plastic water bottles in the village, showing that empowered local bodies could take positive decisions.
- Tourism and waste have a close interlink and with increasing tourists, there is more waste.
- SHGs could be trained in managing and recycling plastic waste
- At national level, to deal with big corporations, some legislation has to be done in terms of reuse of plastic or reverse logistics so that companies are more responsible and take back what they have thrown away not only in Himalayan regions but also in other states.
- A multi-dimensional approach would be appropriate to resolve the plastic issue.
- Legislation was an important aspect, but buy in from the people would also be necessary to ensure that the legislation is followed through for implementation.

Shri Ninong Ering, MLA Arunachal Pradesh

- Tourist footfalls have grown tremendously in all mountain states and there is a need for their sensitisation.
- Swachh Bharat Mission initiated by the Government needs to be taken forward in true spirit.
- Some cities like Gangtok had better management systems in places and this needed to be appreciated and replicated.
- Most focus was on bigger towns (Tawang and the Mechuka area) in Arunachal Pradesh, but smaller towns were not given priority.
- People can suggest proper solutions to the legislators so that these issues can be handled.
- Arunachal Pradesh is a frontrunner in cultivating millets.
- Three varieties of millet are being grown in Arunachal Pradesh and use for different purposes, such as making local liquor.
- Millets benefits for diabetic patients are also well known.

Shri Munna Singh Chauhan, MLA Uttarakhand

- Plastic issue is a catch 22 situation, as there is big dependency on plastics and on the other hand the use of plastic is a serious threat in the ecosystem of the Himalaya.
- The data that large volumes of plastic coming from food packaging has to be taken serious note of.
- For EPR, IMI should make a final recommendation and this can be carried forward.
- Panchayati Raj Institutions and other local bodies can be leveraged to draft local laws. Whatever companies are selling, it must be collected back and also get remunerated. State can make a legislation GoI can consider to make a legislation
- Like CSR, producers must be directed by law on allocation of funds to ensure EPR implementation.
- Segregation is a big problem in the mountains and has made existing projects to fail with communities complaining about waste management plants.
- Banning production may not be practically possible in today's times but we can call the scientific communities to take up this challenge.
- Plastic waste is causing a chain of disastrous effects, one is choking the water waste, people dumping waste in valleys, finally comes down with the floods completely devastating the infrastructure downwards, so it is a cascading effect.
- Millets are synonyms of seed variety in Himalayan region especially Uttarakhand. The reason for the decline in seed variety and the disappearance of millets from our food agenda is due to large attention on wheat and rice production.
- Higher MSP should be fixed for millets along with market support and launch of special missions to encourage millet farming and marketing with IHR.
- International Year of Millets 2023 was a great initiative for bringing the issue of millets to a global scale.

Dr. Lorho Pfoze, MP, Lok Sabha, Manipur

- Issues that IMI has raised on plastic pollution are very critical and important,
- There is more awareness around plastics, and social audits have been conducted but still more intervention is required.
- Involvement and participation of the government is topmost to support the work being done by the non government sector.
- The balance between development and preservation of the mountain ecosystem is important. Activists and experts should provide inputs and work in coordination with the policymakers.
- Cultivation of millets decreased mostly because rice cultivation was much easier than millet cultivation.
- Though now its productivity is much lesser than rice with the new trends in millet cultivation, millets are on the rise. He expressed his gratitude to the Government of India for having taken various initiatives for the reintroduction of millets.

Address from Guest of Honour

Shri Rajkumar Ranjan, Hon'ble Minister of State External Affairs and Education

Shri Ranjan began his talk with reference to the landslides that had occurred in some districts of Manipur, stating that these unfortunate events highlight the urgent need for planning and stringent regulations for the fragile mountain economy and ecology. Mountains can be described as islands of biodiversity surrounded by oceans of monoculture and human altered landscape, he said further adding that human activities were leading to biodiversity loss. For a sustainable mountain ecosystem, policies should focus on conservation, management and support for local communities. Resources and ecosystems in mountainous areas should be conserved and protected while also supporting human wellbeing and development with a well struck balancing of environmental, social and economic factors. The balancing act is most complicated and platforms like MoMs should be used to bring forth diverse viewpoints. One of the key outcomes of the MoMs should be to create solution pathways to address sustainability problems of mountain states and that it will throw some light on the way forward.

The balancing act of environmental, social and economic factors calls for deepened collaboration between government agencies, conservation organizations, local communities and businesses. He said that there is a need to get the policies in order not only for the 50 million people residing in the 13 Himalayan states and territories, but also for the hundreds of millions staying in the Gangetic and Brahmaputra plains. Needless to say, the sustainability of the mountains and management of the mighty rivers originating in the mountains is key to economic stability. The management of the mountain systems merits the utmost and serious attention. Increased instances of flash floods, prolonged droughts, receding snowlines and ever-changing rainfall patterns necessitates the sustainable management of the Himalayan rivers. Stakeholder dialogue in policy making is the only way to bring forward the issues of the mountains.

Address from Chief Guest

Shri Bhupender Yadav, Hon'ble Minister, MoEFCC

Hon'ble Minister congratulated IMI for bringing the issues of the mountains in front of the legislators. He brought forward the efforts put forward in the fight against climate change; The aspect of considering the livelihood of those in the mountains, plastic waste management and building sustainable mountain cities. He said that he attended the SMDSXI in Leh in the year 2022 and that he wished to attend more such summits. He said that he is happy to be able to take forward the deliberations made during these conferences towards tangible actions that have an impact on the mountain states. He talked about how the EPR rules would have an impact on the plastic pollution in the mountains. He also talked about how this year being the international year of the millets have brought forward many schemes to accelerate the growth and use of millets. He said that Neeti Aayog has made many key recommendations to bring development in the Himalaya.

He said that for the Himalayas there are four key recommendations:

1. Conservation of landscape
2. Community engagement (designing, delivery and development of local initiatives such as carbon neutral model of tourism in Ladakh and promotion of local livelihood, skills and other Himalayan states also))
3. Maintaining the cultural legacy of Himalaya in terms of Heritage preservation and assessment of mega investment
4. Commerce linked to economic products keeping the local and with equitable sharing along with good scope for sustainability and promotion of a circular economy, linkage of local products to carbon natural tourism, value chain etc.

Vote of thanks

Ms. Priyadarshinee Shrestha, Secretary IMI

On behalf of IMI and DCCC, Ms. Shrestha expressed her gratitude to Hon'ble Minister, MoEFCC Shri Bhupender Yadav for joining in as the Chief Guest of MoMS 2023. She thanked Shri Raj Kumar Ranjan, Hon'ble Minister of State for External Affairs and Education, Guest of Honour for their presence at the event. She acknowledged the thought behind the multi-disciplinary mountain science forum which Shri Ranjan had expressed and hoped that the association would be continued. She added that the IMI family was highly grateful to all the Honourable Legislators, their presence gives the energy to drive the mountain agenda forward. She thanked them for their inputs on millets and plastic issues, which would be captured in the outcomes of the MoMS.

She acknowledged Shri Ashwini Chaubey, Minister for State, MoEFCC and Shri Ajay Bhatt, Hon'ble Minister for State, Tourism as well as CEC, LAHDC Adv. Tashi Gyalson from Ladakh for their presence in the inaugural day.

She thanked all the speakers, panellist, participants from various institutions and organisations and mentioned their insights and inputs for plastic waste and millets sessions had given fruitful and positive outcomes that IMI hope to take forward.

She thanked all the GC members and the ex GC members of IMI for the guidance in the process of planning and coordination of the event. She thanked all the members and other state delegates from all the states viz. Sikkim, Nagaland, Tripura, Manipur, Mizoram, West Bengal, Uttarakhand and the NCR members.

She thanked the Divecha Centre for Climate Change for their support and especially for the planning and coordination and co-creating the sessions where all the team of DCCC headed by Prof Satheesh and Dr. Smriti Basnett were highly proactive. She acknowledged the support of note takers from Divecha Centre for Climate Change (DCCC) which included young career researchers Joshita S, Suman B. M; Rae Anne, Jency Maria, Harshita Rathore, Adheesh Rao, Office support from Mamatha G.

She thanked Shri Jikmet Takpa, PCCCF, Ladakh and also the President of SDFL, for his efforts and insistence, that enabled IMI to organise the MoMS 2023 in MoEFCC, New Delhi. She also acknowledged the contribution of the MOEFCC officials and the IT team for all their support in organising MoMS 2023.

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