NITI Aayog

A Summary Report

Contributing to Sustainable Development in the Indian Himalayan Region

Key messages from five thematic reports and way forward

NITI Aayog, August 2018

Cover photo: Trisul mountain peaks, Himalayas, Kumaon, Uttarakhand, India
Facing overview: Nohkalika fall, Cherrapunjee, East Khasi Hills, Meghalaya

A Summary Report

Contributing to Sustainable Development in the Indian Himalayan Region

Key messages from five thematic reports and way forward

Revival of Springs
Sustainable Tourism
Shifting Cultivation
Skills and Entrepreneurship
Data for Informed Decision Making

Acronyms and Abbreviations

ATI	Advanced Training Institute
BBIN	Bangladesh, Bhutan, India, Nepal
BIMSTEC	The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation
CAMPA	Compensatory Afforestation Fund Management and Planning Authority
CDMA	Central Data Management Agency
FSI	Forest Survey of India
GBPNIHESD	GB Pant National Institute of Himalayan Environment and Development
GCF	Green Climate Fund
HIMAP	Himalaya Monitoring and Assessment Programme
ICIMOD	International Centre for Integrated Mountain Development
IHR	Indian Himalayan Region
IIT	Indian Institute of Technology
IPCC	Inter-governmental Panel on Climate Change
IT	Information Technology
ITI	Industrial Training Institute
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
MoEF&CC	Ministry of Environment, Forest & Climate Change
MoSPI	Ministry of Statistics and Programme Implementation
MSDE	Ministry of Skills Development and Entrepreneurship
MUDRA	Micro Unit Development and Refinancing Agency
NITI	National Institution for Transforming India
SDGs	Sustainable Development Goals
ToR	Terms of Reference
TSA	Tourism Satellite Accounts
WG	Working Group

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MESSAGE

The Indian Himalayan Region (IHR) that makes up our north and north-eastern borders, comprises 10 mountain States and four hill districts from States of Assam and West Bengal. The region and its communities are a pride of India but experiences a range of demographic, environmental and social stresses.

An estimated four million springs, which are the lifeline for meeting water requirements of millions of people across the region, are interestingly drying up or becoming seasonal, causing untold misery to both rural and urban inhabitants. Tourism related activities in the region are already generating about 23 thousand tons of solid waste every day. With the projected number of tourists expected to more than double by 2025, (reaching 240 million from the current figure of 100 million) — urgent actions are needed to address critical issues of waste management and water conservation.

In addition, the region has seen a slower pace of development as compared to the rest of the country, leading to economic stagnation. Employment and higher education opportunities have been concentrated in the urban centres in the plains, causing the aspirant youth to migrate out. It is necessary that any development activity to economically lift the region, besides being environmentally sustainable, should target the youth. This will also help check migration outflow. Thus a strong thrust on skilling and creating advantageous opportunities in the areas of goods and services is needed.

Five Thematic Working Groups contributing to Sustainable development in the Indian Himalayan Region set up by NITI Aayog in 2017 have presented a shared vision to foster well-being of the people in the region. These relate to improving water security in mountain towns and cities through revival of springs, developing responsible mountain tourism, increasing skilled workforce, transforming shifting cultivation in north eastern hill region to ensure ecological, food and nutritional security and making available required dataset and information.

I congratulate Dr. V.K. Saraswat, Member, NITI Aayog and Dr. Ashok Kumar Jain, Adviser, who led the process for bringing out this timely report. My compliments to experts from relevant Ministries. IHR States and other institutions who have contributed to the development of the road map for Sustainable Development in the Indian Himalayan Region. The next step is to ensure that the recommendations are considered by the concerned Ministries at the Centre and by the IHR States and translated into improved policies and action plans.

(Rajiv Kumar)

Dated: 3rd August 2018
Place: New Delhi

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MESSAGE

With its physical grandeur, natural splendor and spiritual aura, "The Himalayas" have shaped our civilization and cultural legacy that pervades through the lives of 1.3 billion people. However, uncontrolled demand driven economic growth has led to haphazard urbanization, environmental degradation with increased risks and vulnerabilities, seriously compromising the unique values of the Himalayas. Sustainability filter that accounts for environmental, socio-cultural & spiritual elements in addition to economic growth must be the bedrock for Sustainable Development Goals for the Himalayas. Underpinning environmental sustainability is must into all decision-making – be it for livelihood enhancement, urban development, tourism promotion or disaster risk reduction. Mountain specificity needs to be understood, we cannot simply work with pan India solutions for the Himalayas.

NITI Aayog has picked up 5 themes to address some of the key concerns in the Himalayas. Inventory and recharge of springs in the Himalayas for water security to be taken up as a National Mission; application of transformative approaches to short fallow cycle based shifting cultivation; minimizing the adverse impacts of tourism to enhance visitor satisfaction while creating conditions for enhanced local benefits; strengthening skill and entrepreneurship in IHR based on unique mountain products and services; and looking at data that provides for high fidelity scenarios and help in informed decision making.

Developing the roadmap for actions means bringing institutional collaborations at the highest level. It must support processes that bring full ownership of partners/stakeholders at different levels, engaging concerned Central Ministries as well as all the Himalayan States. An "Himalayan Authority", as proposed in the report merits consideration to bring this coordination with lead Ministries at Centre and Himalayan Slates, along with other key stakeholders for synergistic actions. It will also foster regional collaboration to address issues that have regional dimensions, for example, regional tourism circuits, regional markets of niche mountain products etc. to build upon 'Act East Policy' of the Government.

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Science and Technology will have a crucial role to play to address mountain issues. The need to develop a stronger consortia of knowledge centers in Himalayas for providing scientific and technological solution suited to the mountains can hardly be overemphasized. Life cycle and system approach is key to finding sustainable solutions. Scientific assessments like the one under Hindu Kush Himalaya Monitoring & Assessment Programme (HIMAP) need to be factored in. Coordinated by International Centre for Integrated Mountain Development (ICIMOD), a regional organization of eight member countries, the assessment brings out thematic outlooks, deeper understanding of drivers of change and provides for evidence based policy solutions.

A Central Data Management Agency (CDMA) for Himalayan region, proposed in the report needs to be considered for not only ensuring availability of consistent and reliable data having bearing on SDGs but also ensuring that the data sharing happens to help planning and decision making at different scales, from local to national and regional. This would strengthen Government of India's Data Sharing and Accessibility Policy.

Our policies must factor in mountain specificities. Therefore, the recommendations of 5 thematic reports merit consideration in both policy and action planning process. Lastly, given significance of the Himalayas and the challenges it faces today, there is a need to launch "Himalaya Calling", a massive awareness to action campaign that could harness people's energy towards a sustainable and secure Himalaya.

I congratulate Dr. Ashok Kumar Jain and his team at NITI Aayog, various thematic working groups and their leads, Central Ministries and IHR States who participated and contributed in various meetings and discussions. The report is the outcome of this engagement. I must mention role of ICIMOD, Kathmandu particularly Dr. David Molden, Dr. Eklabya Sharma and Shri Brij Mohan Singh Rathore whose presentation triggered the process, and continued engagement ICIMOD team of experts further enriched and supported the process.

(Dr. V K Saraswat)

New Delhi
03.08.2018

अमिताभ कांत
Amitabh Kant
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MESSAGE

Given the uniqueness of the Himalayas, utmost care has to be taken to achieve the growth that addresses environmental and social equity issues. I am happy to see the reports on five thematic areas, all of which are crucial to strengthen the sustainable development pathways in Himalayan States.

Tourism has potential to be an impressive engine of growth in the Himalayas. Projected tourists arrival figure of 240 million by 2025 in Indian Himalayan Region is highly encouraging. However it also brings challenge of managing solid waste and critical services like water, in addition to other environmental and social issues. The idea of ranking States on a composite tourism index covering environmental, social and economic parameters therefore would not only contribute to cooperative and competitive federalism, but also go a long way in contributing to responsible tourism in the Himalayas.

Mapping and revival of springs in Himalayas has to be seen in the larger context of composite water index. Role of spring revival in source augmentation (ground water) will be critical to ensure water security in Himalayas. It must go along with the demand side management. It is good to see that the spring revival protocols bring science of hydrogeology with management and water governance issues. Bringing springs monitoring for ground water source augmentation in mountainous regions will be a useful step to address water issues in Himalayas.

The Indian Himalayan Region has 12 aspirational districts. Actions on strengthening of skill and entrepreneurial landscape, responsible tourism, transformative approaches to shifting cultivation in the north eastern States, revival of springs and breaking data silos will greatly contribute to achievement of aspirational districts.

Guidance of Dr. V.K. Saraswat, Member, NITI Aayog with able facilitation by Dr. Ashok Kumar Jain, Adviser, NITI Aayog has resulted in bringing out these reports. I must compliment all the Ministries, Himalayan States and institutions to have made this possible. The next step is to get the key recommendations considered as part of action planning by the concerned Ministries and Himalayan States.

(Amitabh Kant)

New Delhi
09.08.2018

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PREFACE

The process of preparing five thematic reports started with a presentation made by the International Centre for Integrated Mountain Development (ICIMOD) team at NITI Aayog in June, 2016. The then Vice Chairman, NITI Aayog, Dr. Arvind Panagariya agreed that the process be facilitated by NITI Aayog under the overall guidance of Dr. V.K. Saraswat, Member, NITI Aayog. Five Working Groups were accordingly set up in five thematic areas namely, (i) Inventory and Revival of Springs in Himalayas for Water Security, (ii) Sustainable Tourism in Indian Himalayan Region, (iii) Shifting Cultivation: Towards Transformational Approach, (iv) Strengthening Skill and Entrepreneurship Landscape in Himalayas, and (v) Data/Information for Informed Decision Making by Multiple Stakeholders. These were seen as important areas contributing to sustainable development of Indian Himalayan Region (IHR). It was agreed that the Working Groups will be led by concerned Ministry/Department/Institution and have representation from other related Ministries, institutions and subject experts. The Working Groups used a range of methods including review of literature, consultations, questionnaires, meetings, and personal communications.

With the engagement and inputs from IHR States, concerned Central Ministries and subject experts, the Working Groups have developed the reports, detailing out recommendations in the five thematic areas. A summary report has been prepared that builds on the key messages from five thematic areas and shares a road map for actions built around institutions and processes, research and technology, awareness and capacity building, leveraging finance, and overall policy/planning.

I thank Dr. Akhilesh Gupta, Adviser, Department of Science and Technology for leading the Working Group I on 'Inventory and Revival of Springs in Himalayas for Water Security'; Mr. Vikram Singh Gaur, Joint Secretary, NITI Aayog for leading the Working Group II on 'Sustainable Tourism in Indian Himalayan Region'; Dr. R.M. Pant, Director, National Institute of Rural Development-North Eastern Region for leading the Working Group III on 'Shifting Cultivation: Towards Transformational Approach'; Dr. Jyotsna Sitling, Joint Secretary, Ministry of Skill Development and Entrepreneurship for leading the Working Group IV on 'Strengthening Skill and Entrepreneurship landscape in Himalayas'; and Er. Kireet Kumar, Senior Scientist, G.B. Pant National Institute of Himalayan Environment and Sustainable Development for leading the Working Group V on 'Data/Information for Informed Decision Making

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by Multiple Stakeholders'. They have devoted a lot of their time in preparing the reports. I also thank Dr. Himanshu Kulkarni, Advanced Center for Water Resources Development and Management, Pune, and Dr. B. K. Tiwari, Professor, North Eastern Hill University, Shillong for closely associating with the Working Group I and III respectively and providing their valuable inputs. The task would not have been possible without the engagement of concerned Central Ministries and Himalayan States. I must also thank Dr. David Molden, Director General, Dr. Eklabya Sharma, Deputy Director General and the team of experts from International Centre for Integrated Mountain Development, Kathmandu, Nepal led by Mr. Brij Mohan Singh Rathore, Chief Policy Adviser, ICIMOD along with Dr. Rajan Kotru, Dr. Dhrupad Choudhury, Dr. Aditi Mukherji, Dr. Soumyadeep Banerjee, Dr. Vishwas Chitale, and Dr. Suman Bist who contributed to the Working Groups and provided overall support to process facilitation. Also thanks to Mr. Samuel Thomas, Mr. Dharma Ratna Maharjan and Ms Laurie Vasily from ICIMOD for helping with editing, layout and design of the reports.

I will be failing in my duties if I do not mention my team in Rural Development Vertical at NITI Aayog, particularly Dr. Monika Singh, Senior Research Officer who has always been forthcoming and has remained engaged throughout the process. I also thank Mr. Neeraj Srivastava, former Director and Ms. Kratika Mittal, former Senior Research Officer in Rural Development Vertical at NITT Aayog for their contribution in taking forward this initiative. I am sure that these reports in five key areas will be very useful in guiding the process of planning and implementation of programmes and contribute to sustainable development in the Himalayan States of our country.

Finally, it was the overall steering and guidance of Dr. V.K. Saraswat, Member, NITI Aayog, and support of Dr. Rajiv Kumar, Vice Chairman, NITI Aayog, and Shri Amitabh Kant, Chief Executive Officer, NITI Aayog, which made the process of getting these reports in place. As the saying goes 'the proof of the pudding is in the eating', therefore, follow up on these thematic reports and building the road map for actions will be the key in taking this process forward.

(Ashok Kumar Jain)

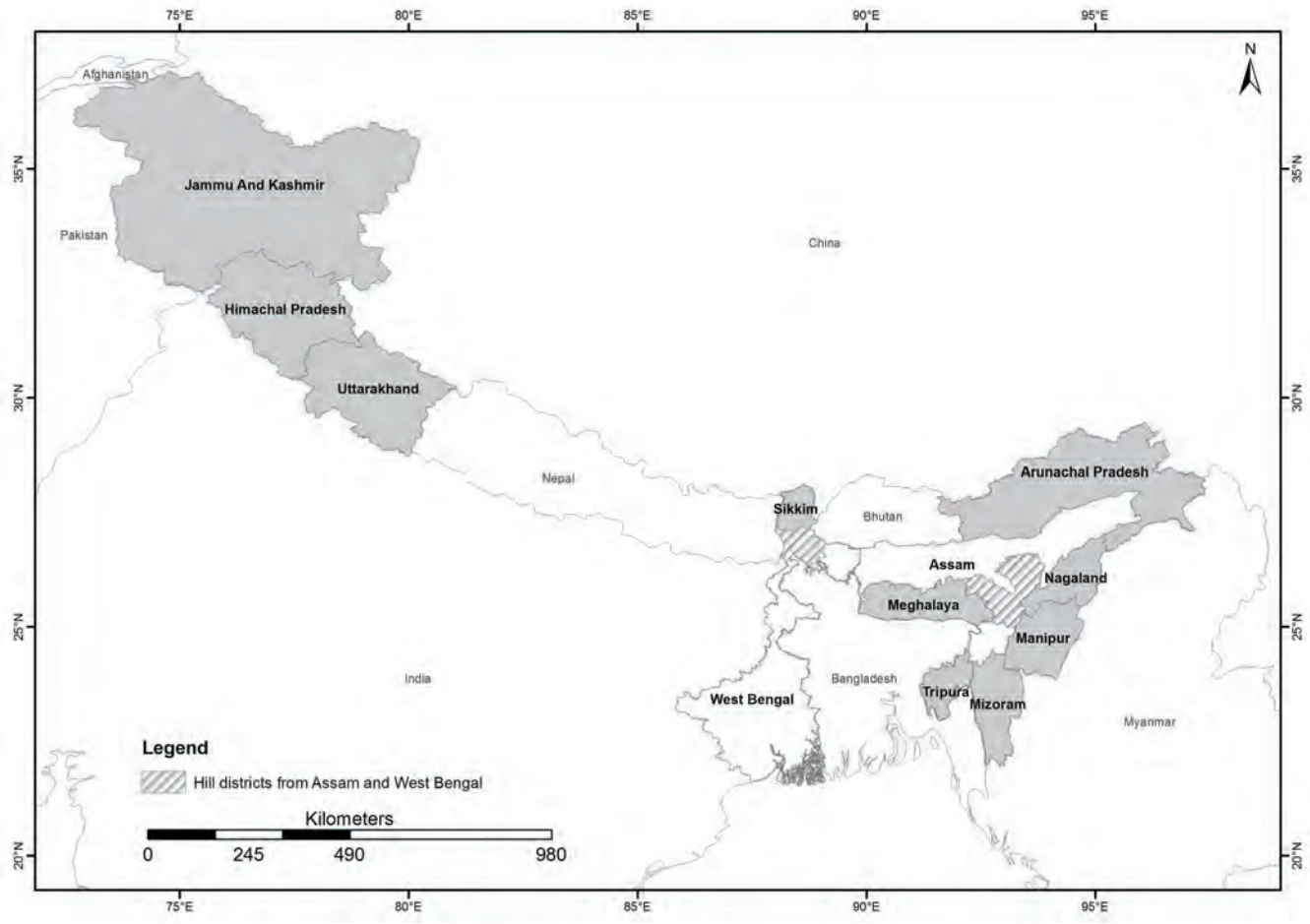
New Delhi
09.08.2018

Contents

1. Overview

The Indian Himalayan Region (IHR) covers 533,000 sq.km. across 10 mountain States and four hill districts of India that make up our north and north-eastern borders (Figure 1). The region stretches from the mountains in the northern States of Jammu & Kashmir, Uttarakhand, and Himachal Pradesh to the north-eastern States of Sikkim, Arunachal Pradesh, Meghalaya, Manipur, Mizoram, Nagaland, and Tripura, and also covers the hill districts of Dima Hasao and Karbi Anglong in Assam and Darjeeling and Kalimpong in West Bengal. IHR shares borders with 6 neighbouring countries with upstream-downstream geographical connect.

Figure 1: **Indian Himalayan Region (IHR)**



1.1 Unique IHR

The Himalayas have been revered as the abode of well-being for humankind from time immemorial. However, the well-being of the Himalayas too has been of equal concern since the time of Atharvaveda.

Pleasant be thy hills, thy snow clad mountains and thy woods

On this Earth, I remain, un-slain, unhurt and unvanquished.

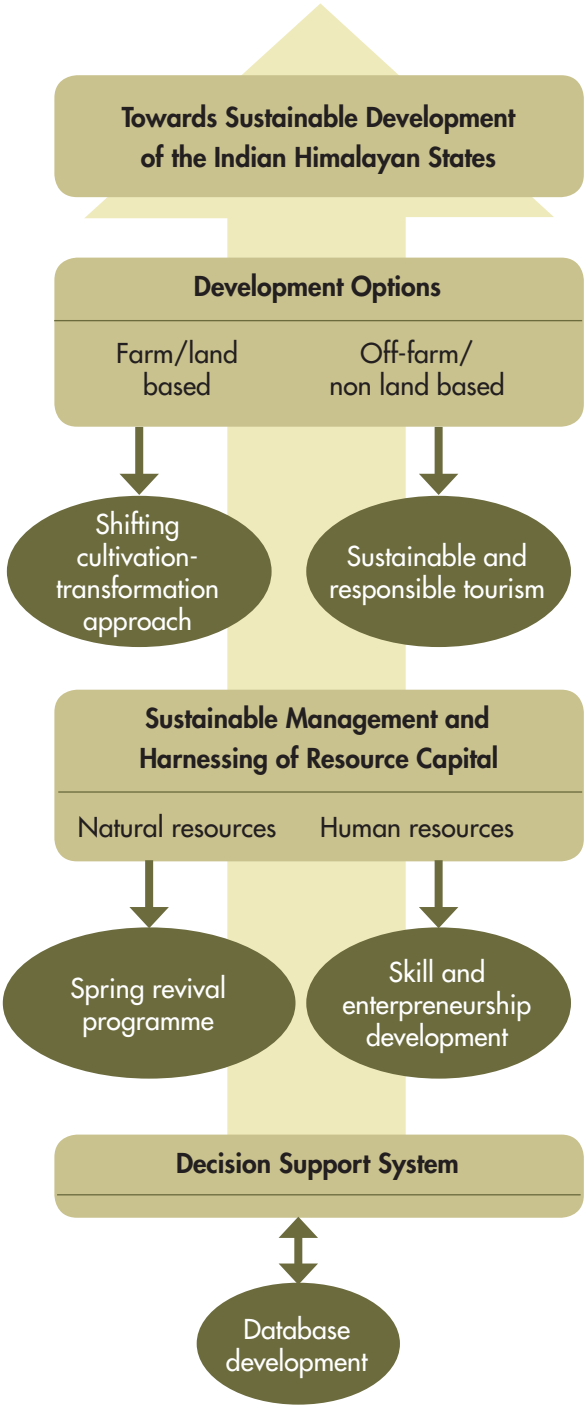
– Hymn to Mother Earth: Atharvaveda

As the loftiest mountains on the planet, the Himalayas embody our highest ideals and aspirations. Their physical grandeur, natural splendour and spiritual aura are unparalleled. However, these geologically young mountains face serious challenges. The mountains and mountain-dwelling communities are experiencing a range of demographic, environmental, social, and political stresses. Mountain specificities are important conditions characterising mountain areas, which - for operational purposes – separate mountain habitats from other areas (Jodha, 1990). The three important mountain specificities, which directly affect the livelihoods of mountain people in the Himalayas are inaccessibility, fragility and marginality. Deteriorating environmental assets, out-migration and the rapidly eroding cultural fabric and social value of collectivism unique to the IHR have become causes of concern. Climate change has further accentuated the situation. Generally, drivers of migration – which may include fast changing demographic, economic, environmental, political and social aspects – and their combination with individual and household characteristics shape decisions to migrate. However, it is the economic drivers that will continue to be the most influential among these drivers. The aspirations of youth, the concentration of higher education opportunities in urban centres, the progressive development of transportation infrastructure and digital communication will further contribute to the influence of the economic driver (Siddiqui et al., forthcoming).

1.2 Himalayas Call for a New Development Narrative

Development in the Himalayas must be fully embedded in the environmental, socio-cultural and sacred tenets that have been the hallmark of the Himalayas since time immemorial. Uncontrolled demand-driven economic growth has led to haphazard urbanization, environmental degradation and increased risks and vulnerabilities, seriously compromising the unique values of Himalayan ecosystems. In addition to a focus on economic growth, the roadmap for sustainable development of the Indian Himalayas needs to be in sync with the relevant Sustainable Development Goals (SDGs). The road map for actions needs to be governed by sustainability approaches within environmental, economic, socio-cultural arenas for the ultimate well-being of people in the region and beyond.

2. Five Thematic Areas and Key Messages



Recognising the uniqueness of the Himalayas and the challenges for sustainable development, NITI Aayog set up 5 Working Groups (WGs) to draft a roadmap for actions in 5 thematic areas. While these thematic areas are quite significant for the Himalayas, they are not exhaustive by any means. Mountain specificities require specific solutions for resilience building that address socioeconomic and environmental challenges in the mountain setting. The reports from the five groups discuss the significance, the challenges, the ongoing actions and a future roadmap.

Process Map and Timelines

- **15th June, 2016:** Meeting on Sustainable Mountain Development focusing on the Indian Himalayan Region; International Centre for Integrated Mountain Development (ICIMOD) makes a presentation; the key areas of concern discussed.
- **7th May, 2017:** Meeting at NITI Aayog and the decision to set up 5 Working Groups with draft ToRs.
- **2nd June, 2017:** Constitution of 5 WGs and ToRs
- **3rd July, 2017:** Meeting of Inter-thematic Group to discuss ToRs and methodology.
- **23rd October, 2017:** Review of progress by NITI Aayog.
- **24th May, 2018:** Draft reports circulated to IHR States/Central Ministries for comments.
- **27th June, 2018:** Meeting of IHR States, Central Ministries and thematic leads convened by NITI Aayog.
- **15th July, 2018:** Revision of reports; development of Summary Report.
- **27th July, 2018:** Circulation of Summary Report.
- **10th August, 2018:** Thematic Reports and Summary Report review and revisions, NITI Aayog.

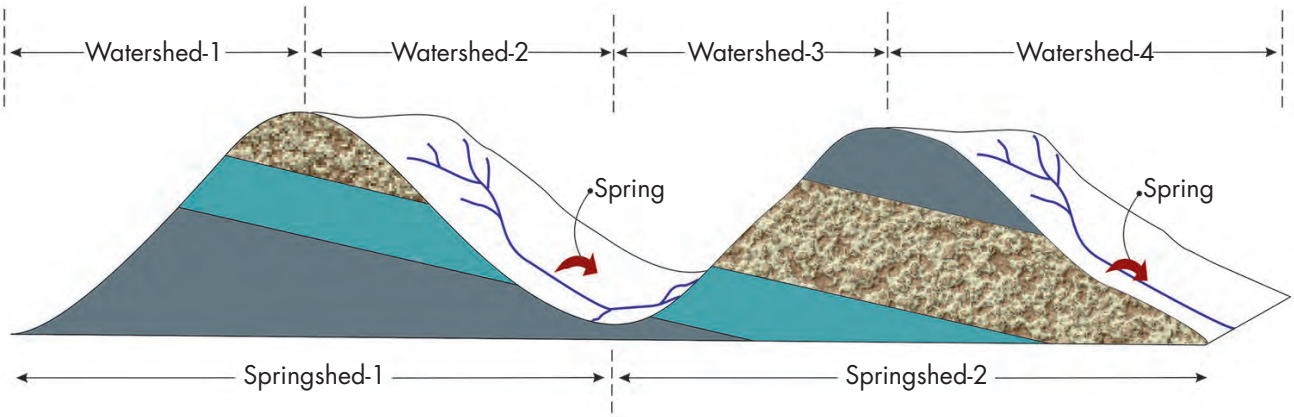
In addition to the meeting convened by NITI Aayog, the respective Working Groups had multiple meetings. The Working Groups have largely used secondary data, and consultative meetings/ workshops in the development of the reports. Limited use of questionnaire-based responses have been solicited in 2 reports.

The key messages from these reports are highlighted below.

2.1 Inventory and Revival of Springs in the Himalayas for Water Security

- Springs are groundwater sources in the mountains and are the lifeline of millions of people across the Himalayas. These are increasingly drying up, or becoming seasonal, causing untold misery to both rural and urban inhabitants. The water problems of Shimla and other hill towns in India are a direct result of drying of springs. According to one estimate, of some 4 million springs in the Himalayas, at least one third are drying up and more than half have witnessed decline in water discharge.
- The traditional watershed approach does not include aquifers (groundwater) and hence there is a need for a new paradigm that combines watersheds and aquifers to form a spring-shed. In the Himalayan context, where there has been intensive folding and faulting, surface water flow direction (as defined by watershed boundaries), can and does differ from sub-surface geological boundaries that determine spring water movement. So, very often, the recharge area of a spring located in one watershed lies in another watershed and therefore there is a need to look beyond a single watershed and instead identify recharge areas of springs correctly using hydrogeology (Figure 2).
- Building on best practices, (e.g., Dhara Vikas in Sikkim and others), the report lays out a roadmap for implementing spring revival programmes across the Himalayan States in a mission mode. This includes mapping, inventory and rejuvenation of springs across the Himalayas using a generic spring revival protocol. The spring revival protocol uses field geology and community knowledge to demarcate recharge areas of springs. Appropriate interventions are then undertaken in those areas to enhance recharge. In addition, it emphasizes community approaches to spring management.
- A programme of this scale will not be possible without collaborative actions across related

Figure 2: **Two watersheds form one springshed**



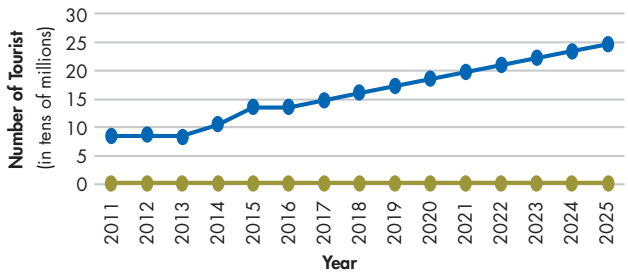
Source: Shrestha et al., 2018.

Central and State Government Ministries, scientific institutions, communities and civil society organizations. A massive thrust on developing a cadre of para-hydrogeologists will build the skills of community youth for gainful skilled employment.

2.2 Sustainable Tourism in the Indian Himalayan Region

- Tourist arrivals in the Indian Himalayan States are projected to reach 240 million by 2025, which is 2.5 times the current tourist arrivals at 100 million (Figure 3). The environment performance index of the Himalayan States on tourism currently includes only two IHR States in the top ten.
- Current forms of tourism in the IHR are unsustainable. They replace traditional eco-friendly and aesthetic architecture with inappropriate, non-aesthetic and often dangerous constructions, and compound other challenges such as poorly designed roads and associated infrastructure, inadequate solid waste management, air pollution, degradation of watersheds and water sources, loss of natural resources, biodiversity, and ecosystem services.
- The cultural fabric and social values of collectivism – which have historically been hallmarks of mountain communities – are fast eroding. Mass tourism is already causing ecological degradation and social disharmony.
- Key elements towards developing sustainable and inclusive tourism in the Himalayas include an assessment of the carrying capacity of tourist destinations across existing and potential tourism sites; development of tourism satellite accounts to comprehensively measure contributions of tourism to the State and national economy; cess or higher user charges/levies on service providers and consumers; developing, implementing and monitoring tourism sector standards (e.g., hospitality, hotel and tour operators compliance standards); building skills and entrepreneurship in the tourism sector using a value chain approach and resultant greater engagement of local work-force; potential business sector reinvestments in conservation and local skill and entrepreneurship development; sensitization of visitors; and online information on real-time carrying capacity and local implementation of safety and security norms to decongest tourist destinations or host visitors as per the local carrying capacity.
- IHR States need to promote inclusive community-based management models based on principles of fair and equitable benefit sharing. The engagement of local communities in various forms needs to be highlighted and reinforced in promoting public-private partnership models. Business plans for "Smart Mountain Tourism Destinations" could be prepared on the lines of Smart Cities and the private sector encouraged to invest in responsible tourism. Environmental auditing – based on environmental efficiency, carbon footprint and certification – that is part of eco-labelling, can enhance the application of social and environmental safeguards in the tourism industry. Such business plans need to integrate disaster risk management (e.g., floods/droughts, earthquakes, safety and security standards), water conservation, and waste management. The concept of incentivizing best practices should be based on meeting eco-

Figure 3: **Tourist arrival forecast by 2025**



Source: Compiled based on the Tourism Master Plans of the IHR States

labelling and other standards and use of these incentives for equitable and fair benefit-sharing or reinvestments in local development.

2.3 Shifting Cultivation: Towards A Transformational Approach

- While different programmes to address shifting cultivation claim drastic reduction both in the practice and in the area under shifting cultivation, large scale forest cover loss in Northeast India is still attributed to shifting cultivation (FSI, 2015). There is lack of updated and authentic data on the area under shifting cultivation as well as the total number of households currently practicing shifting cultivation. About 8,500 sq. km of area in northeast India is shown under shifting cultivation (MoSPI, 2014), but there is data inconsistency between agencies. There is an urgent need to update data on the area under shifting cultivation as well as the total population still involved with the practice.
- Managing transformations in shifting cultivation areas is fundamental to agricultural development in the uplands of Northeast India and is a contributing element of the Act East Policy. Transformation of shifting cultivation is therefore key to agricultural transformation in the region.
- Managing transformational change that ensures optimized production and protection in the context of shifting cultivation requires the active involvement of multiple Ministries and agencies, posing a challenging task for coordination and synergistic action. For ensuring effective coordination and strong synergistic action, setting up a Mission on managing transformations s in shifting cultivation is proposed under the highest authority.
- Some key elements of the road map to manage transformation in shifting cultivation recommended for action are:
  - ◊ Updating the information on shifting cultivation (area under cultivation/fallow and households involved); encouraging States and Central Ministries to recognise home gardens as a distinct agricultural land use category with dedicated schemes for promotion of home gardens, promote niche crops and other products that provide income and entrepreneurship development opportunities for shifting cultivators; and, village level perspective land use planning and zoning to improve land use, resource conservation and tenurial security.
  - ◊ Amendment of credit guidelines to allow group guarantee (from village/clan authorities) for loans instead of land title deeds in the shifting cultivation areas; categorization of shifting cultivation lands as distinct land use, recognising that it is both an agricultural and forest management practice conducted on the same plot of land but at sequentially separated times.
  - ◊ Adopt a 'landscape' or 'systems' approach for planning and capacity building programmes. Integration of various land use elements at the landscape level is fundamental to the success of transformation of shifting cultivation in Northeast India. This is fundamental for building up a strong, technically capable cadre of scientists, agricultural officers and extension workers to deal with transformation efficiently and appropriately.

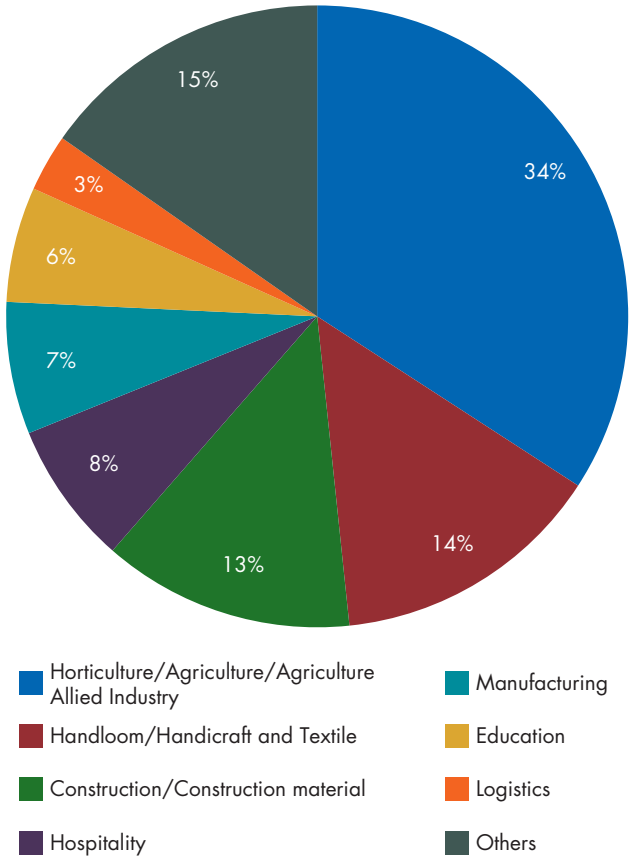
2.4 Strengthening the Skill and Entrepreneurship Landscape in Himalayas

- It is estimated that only 4.69% of the total workforce in India has undergone formal skill training as

compared to 68% in UK, 75% in Germany, 52% in the US, 80% in Japan and 96% in South Korea (MSDE, 2015). It is likely that the percentage of workforce with formal skill training in many IHR States is even less than this national average. According to the National Skill Development Corporation, horticulture/agriculture/allied industries, handloom/handicraft and textile, construction/construction material, hospitality, education and manufacturing are major sectors in the IHR that would have considerable human resources requirement between 2017 and 2021 (see Figure 4).

- There are several challenges to skill and entrepreneurship development in the IHR, such as: inadequacy of training centres; lack of quality assessors and trainers; lack of synergy between quality of training and prescribed industry standards; limited awareness regarding skill and entrepreneurship development programmes among youth; difficult terrain; weak infrastructure; low economies of scale; limited local demand; and, lack of market access.
- The Ministry of Skills Development and Entrepreneurship (MSDE) has the overarching mandate for developing skills and entrepreneurship in the country. These activities are also supported by several Central Ministries, State Departments and private sector entities. While this enhances opportunities for skilling and entrepreneurship, it also creates challenges for coordination, collaboration, monitoring and evaluation at various levels.
- The report identifies five priority sectors for improving skills and entrepreneurship. These include: agri-entrepreneurship in niche mountain products (e.g., off-season vegetables, medicinal and aromatic plants, spices, health food, food processing, and handicrafts); sustainable mountain tourism with its wide range of products; ecosystem-based employment opportunities; IT enabled services; and skilling for construction projects (particularly green infrastructure).
- Key actions include: developing a cadre of trainers and assessors; developing a network of skill centres; better integration of vocational training in school and undergraduate education; skilling of migrant workers and entrepreneurship development among returnees; strengthening of public-private partnership (e.g., apprenticeship model); and development of qualification packs and national

Figure 4: **State Sector-wise Human Resource Requirement, IHR States, 2017-2021**



Others include: Sericulture and rubber, food processing, banking, healthcare, mining, automobile, real estate, postal and communication, hydropower/power, IT/ITES, border trade, motor repair and maintenance, forest-based industry, unorganized, and miscellaneous.

occupational standards for unconventional sectors that are relevant for the IHR.

- This must be supported by the empowerment of skill missions at the Centre and within the IHR States to ensure convergence of Central and State schemes, programmes, projects and missions that could boost skill and entrepreneurial initiatives.

2.5 Data/Information for Informed Decision-Making by Multiple Stakeholders

- A comprehensive database on the IHR needs to be developed for informed decision-making.
- Current challenges related to data management include: sharing of available data; authenticity; compatibility and comparability; validation; access charges; archiving; the non-availability of unpublished data; and, policies regarding time-frame for bringing unpublished data to the public domain.
- There is a need to set up an accredited Central Data Management Agency (CDMA) for the IHR, which will focus on digitizing and harmonizing the data on IHR for scale, formatting it and making it available in the public domain on the national data portal. Given the mandate for sustainable development of the Himalayan region, GB Pant National Institute of Himalayan Environment and Sustainable Development can be tasked to be the CDMA.
- To ensure the sustainability and regular update of data from this database, implementation of National Data Sharing and Accessibility Policy (NDSAP) through regular feedback from the designated State and Central agencies is crucial.

3. Road Map for Actions

Building on the key messages from the five thematic reports, as well as from discussion/agreement reached in the meetings, an overarching roadmap for actions, with connections to the SDGs is shared below.

Global sustainable development priorities and aspirations for 2030 are enshrined in the 17 SDGs and 169 targets. The SDGs seek to mobilize global efforts to end poverty and hunger, promote prosperity for all human beings, protect the planet from degradation and foster inclusive societies. Since these goals are interconnected, the success in one thematic area is likely to play an important role in addressing issues that are commonly associated with another thematic area. For example, the proposal to develop a cadre of para-hydrologists by the Skill and Entrepreneurship thematic area, which is closely associated with SDGs 4 and 8, would support the Revival of Springs, and in turn contribute to SDGs 6, 13 and 15. Similar reinforcing connections could be identified between different thematic areas in the context of the SDGs. Further details on the interlinkages between the five thematic areas and the SDGs are provided in Annex 2.

3.1 Shared Destination/Goals

A road map contributing to sustainable development in the Himalayas built around five themes, requires shared destinations/goals, developed through inclusive processes of stakeholder engagement. While the overall vision would be to foster the well-being of the people in the Himalayas and beyond, the indicative destination/goal for each of five themes, to be achieved on or before 2030 (in sync with relevant SDGs) is listed below:

- Improving water security in mountain towns and cities through a full inventory of Himalayan springs and revival of springs where water quantity and quality has deteriorated;
- Promoting responsible tourism (at scale) in the IHR that fosters socio-economic development while natural and cultural legacy is preserved;
- Building a skilled workforce in the Himalayas that is at least 3 times higher than the current baseline;
- Managing transformations to ensure ecological, food and nutritional security of households currently involved in shifting cultivation; and
- Ensuring that required datasets and information are freely available to users at different scales for informed decision-making.

3.2 Institution and Processes

Achieving these goals will need the highest level of collaboration among institutions at different levels. Suggested actions under each theme and across the themes require engagement of multiple stakeholders including the concerned Ministries/departments, the private sector, communities, research and training institutions, civil society organizations, and others. Inter-institutional coordination, collaboration and synergy therefore become crucial for making an impact.

The following actions will be useful:

- **The concerned Ministry/Department/Institution** at the Centre and similar such agencies in the States will need to engage multiple stakeholders, foster collaborative partnerships and build synergy for planning, implementation and monitoring of the

missions/programmes related to the five thematic areas. Annex 1 shows the list of suggested Ministries/departments/institutions to facilitate the follow up actions.

- A **"Himalayan Authority"** as an overarching institution may be set up to coordinate integrated and holistic development of the Himalayan States, to ensure convergence and synergy, to provide strategic guidance, to commission assessments of the programmes and to monitor fulfilment of the SDG goals. It would also foster regional collaboration to address issues that have regional dimensions (e.g., regional tourism circuits, regional markets of niche mountain products etc.) to build upon the Act East policy of the Government. Overall, this authority could have the mandate of setting frameworks of inclusive development of the IHR and also set performance standards and indicators that could be monitored and evaluated in alignment with SDG targets. This authority could regularly assess and rank IHR states based on their performance and provide recommendations for incentives. This Himalayan Authority may be housed in the NITI Aayog. The Chief Secretaries of the IHR States, Secretaries of concerned Ministries at the Centre, subject experts and think tank representatives could be members of the authority.

3.3 Awareness and Capacity Building

Recommendations from each theme underscore the critical significance of awareness and capacity building across a range of stakeholders to achieve desired goals.

- **A Network of Centres** in the IHR aimed at meeting increasing demand for a skilled workforce in the IHR will require capacity development on scale, in terms of hands-on training, new skills, knowledge and entrepreneurial opportunities. This will be key to translate many of the recommendations from the thematic reports, be it developing a cadre of para-hydrogeologists to help in mapping and rejuvenation of springs, developing new age agri-entrepreneurship, harnessing opportunities to promote responsible tourism value chains, getting households to adopt transformative approaches to shifting cultivation, or data collection/ generation and effective data utilization by users. Establishing such a network of centres will need proactive engagement of the respective line agencies at both the Centre and State levels, private sector entities, research/training institutes, ITI/ATIs, vocational courses in schools and colleges, business incubation centres, field schools for farmers, and technology centres to create a pan-Himalayan skills and entrepreneurship landscape that harnesses and augments mountain goods and services. The capacity building endeavour needs to be positioned as one that is driven by demand, rather than supply.
- **"Himalaya Calling"** – an awareness-to-action campaign. Sharing the uniqueness of the Himalayas, addressing the multifarious challenges faced in the Himalayas, and harnessing opportunities for sustainable development in the Himalayas will require a massive awareness-to-action campaign which will engage multiple stakeholders at different scales. The campaign will be about listening to the mountains, mountain people and downstream populations and bringing larger societal awareness for actions. This could evolve as a people's movement to foster resilience building throughout the Himalayan region. The campaign could be a collective endeavour of the concerned Central Ministries and State Governments in the IHR along with multiple agencies and stakeholders from civil society, academia, research and training institutions,

schools/colleges, people's representatives, community leaders, private sector, media, regional organisations, and donor agencies. Ministry of Environment, Forests and Climate Change in collaboration with relevant Ministries at the Centre and other key institutions will be uniquely placed to visualise and facilitate the campaign till 2022. The initiative could use a range of best practice learning, and innovative communication tools and processes to identify multiple stakeholder interests and priorities and people at large to support integrated and holistic planning, implementation and monitoring at various levels.

3.4 Research and Technology

The significance of scientific research and innovative technologies has been underscored in all five thematic reports. This includes bringing hydrogeological understanding to spring revival work, research in product development using niche mountain resources for skilling and entrepreneurship, new ideas/research in carrying capacity assessments for new tourist destinations and developing standards for certification of tourism products and services. Research and technologies need to focus on opportunities offered by mountain specificities. One key area where research needs to be strengthened is the blending of traditional knowledge on resource management and use with state-of-the-art science and technology.

The recommendations on research and technological innovation in the thematic reports can be supported by the following actions:

- A consortium of institutions of higher education like IITs, universities in the IHR, the National Innovation Foundation and other research institutions for mass promotion of resilience-building research and technology solutions that are simple, affordable and replicable. The Department of Higher Education, Ministry of Human Resources Development could play a lead role in developing this consortium.
- Curricula in the IHR institutions need to strengthen research and education in appreciating mountain specificities, as well as the challenges to and opportunities for developing sustainable solutions. The India chapter of the Himalayan University Consortium facilitated by ICIMOD could take this responsibility.
- Link with Hindu Kush Himalaya Monitoring and Assessment Programme (HIMAP), which is coordinated by ICIMOD. The programme assesses various threats/challenges that these mountains face and the overall response needed to address them. This is an assessment – similar to the IPCC – but which focuses on the Hindu Kush Himalayan region, and links with SDG consistent mountain priorities and targets. The first assessment report will be released by November 2018.

3.5 Finance

To take and translate many of the recommendations from the five thematic reports into actions, the agencies will require enhanced financial outlays and financial support. Some of the actions include:

- **Convergence and Leveraging:** Proposed institutional mechanisms should help in the convergence of schemes/programmes/priority actions suggested under the five themes with related ongoing programmes/schemes/missions supported by the Centre and the States. Similarly, the key schemes identified for leveraging of financial resources in the reports could be harnessed. An assessment of all the relevant public schemes and business investments can be made for convergence and leveraging (e.g., CAMPA, MGNREGS and the National Clean Energy Fund could be leveraged for programme on spring rejuvenation). Similarly,

schemes and programmes drawn from the five thematic reports and taken up as a National Programme in Mission mode (such as a National Programme on Spring Water Management) will need support from the coordinating Ministry in terms of enhanced financial outlay, in addition to harnessing opportunities from convergence and leverage with related ongoing schemes.

- **Incentive to States for Sustainable Practices:** The 15th Finance Commission in its Terms of Reference has provisions to consider incentives to States based on performance measurement in key areas – including solid waste management and sanitation – and achievements made against SDG targets. On similar lines, it would be useful to consider incentives to mountain states for sustainable tourism practices.
- **The Tourism Satellite Accounts (TSA)** as recommended in the Sustainable Tourism report will help in capturing contributions of the sector to the state GDP and a case for enhancing state investment in tourism which currently is meagre, the highest being in the State of Sikkim (1.9% of total state expenditure).
- **Introduction of a Green Cess:** The uniqueness of the Himalayas in terms of nature's bounty, as well as its cultural, recreational, rejuvenation and spiritual values make it a desirable destination for people from all walks of life. However, the very values of the Himalayas that make it a unique destination have come under tremendous stress in terms of water, solid waste, forests and biodiversity, cultural heritage, and increased loss of life due to disasters. With tourist arrivals projected to double by 2025, and various other factors, many of these destinations will no longer be sustainable. Introduction of a green cess – in the form of payments from service consumers – can increase tax revenue and help maintain and enhance critical services. However, there is need to learn from the green cess introduced in Delhi and elsewhere, and provide for transparent use of revenue from such a cess.
- **Easy access of institutional finance:** Easy availability of institutional finance through banks, financing under MUDRA, Skill India, Start Up India, Stand Up India and other institutional mechanisms will greatly assist in strengthening the skill and entrepreneurship landscape in the Himalayas for identified priority sectors.
- **Enabling credit guidelines** be put in place to allow group guarantee (from village/clan authorities) for loans, instead of land title deeds for sustainable land-use practices in shifting cultivation areas (transformative approaches).
- **Green Climate Fund (GCF)** may be leveraged for launching a pan-Himalayan programme of spring revival, transformative approaches to shifting cultivation, sustainable tourism, and support to skill and entrepreneurship.
- **Fund for Pan Himalayan Database management:** There should be a specific fund or financial support to the Central and State agencies that will promote data collection/generation and also its hosting at CDMA for effective dissemination.

3.6 Policy Environment

The need for IHR mountain-specific policies has been highlighted in the recommendations across the five thematic areas. Such policies need to factor in mountain specificities while addressing the SDGs. The following actions could contribute to providing an enabling policy environment:

- **Informing ongoing policy processes:** There are ongoing policy processes which could benefit from the recommendations of the five thematic reports. For example, the Draft National Water Framework Bill can ensure that springs are considered as groundwater resources and give high priority to springs revival. The role of spring revival as source augmentation (ground water)

will help in improving the performance of IHR States on the composite water index. The Draft National Forest Policy can consider the recommendation that jhum areas are managed as distinct land-use on the principle of landscape management and use of transformation approaches to ensure ecological security, as well as food and nutritional security. Shifting cultivation fallows must be legally perceived and categorized as 'regenerating fallows' which may, given sufficient time, regenerate into secondary forests. Similarly, as suggested, establishment of a Central Data Management Agency for the IHR can provide easy data availability and user accessibility, as well as boost the implementation of the National Data Sharing and Accessibility Policy.

- **Strengthen regional dimension in policy and planning:** All the thematic issues can be better addressed by strengthening regional cooperation. On the issue of springs, the recharge areas for many springs may not follow national boundaries. Shifting cultivation is a regional phenomenon in Northeast India, Bangladesh, and Myanmar. Similarly, mountain tourism can immensely benefit from transboundary circuits and many product value chains can tap sub-regional markets. Sharing of transboundary data through institutional mechanisms can help better manage disasters and effective transboundary management of biodiversity. The regional dimensions of the five thematic areas is also in sync with the thrust of the Government of India's Act East policy and regional/sub regional initiatives like BBIN and BIMSTEC, which emphasize increased connectivity and cooperation. Existing policies, policies currently under review or revision and the planning processes therefore should factor in regional/sub-regional dimensions.
- **Commission new assessments and framework policy guidelines:** Given the uniqueness of the Himalayas, the proposed Himalayan Authority under the NITI Aayog may commission assessments in other key areas critical for sustainable development in the Himalayas, such as disaster risk management, energy and infrastructure, transport, forests and biodiversity, urbanization, health, education, etc. One of the key outcomes from all these assessments would be to evolve framework guidelines for supporting sustainable development of the IHR. These framework guidelines would further help the concerned Ministries/Departments/sectors to improve policy, regulation, planning, and implementation.

3.7 Action Planning, Implementation and Monitoring

- Recommendation of the thematic reports and the Summary Report need to be considered by the IHR States and concerned Ministries/Departments/lead agencies at the Centre for developing programmes and action plans. For example, the recommendation of the Working Group on revival of springs for launching a National Mission on Spring Water Management for IHR would mean developing a detailed project report under the leadership of the Ministry of Water Resources, River Development and Ganga Rejuvenation. Similarly, a Mission to transform shifting cultivation could be led by the Ministry of Agriculture. The Ministry of Tourism could look into recommendations of the Working Group on Sustainable Mountain Tourism and ensure that key actions related to tourism destination plans, destination carrying capacity, tourism satellite accounts, promoting regional transboundary tourism circuits and the development of IHR specific certification standards for tourism products and services are integrated in the action plans. The Ministry of Skill Development and Entrepreneurship at the Centre and Skill Missions

at the State level are uniquely placed to lead strengthening of skill sets and entrepreneurship in the IHR, particularly in the identified priority sectors. GB Pant National Institute of Himalayan Environment and Sustainable Development could to develop a detailed project proposal for establishing a Central Data Management Agency for the Indian Himalayan Region.

- Consistent monitoring and evaluation of performance indicators annually can be used to monitor progress and better performing States can be incentivized accordingly.
- Setting up an institutional platform like a "Himalayan Authority" at the national level will help in bringing the desired coordination, convergence and synergy and also help in monitoring progress.

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Annex 1

Thematic Areas and Ministry/Department/Institution

Thematic Area/Subject	Suggested Ministry/Department/institution
Inventory and Revival of Springs in the Himalayas	Ministry of Water Resources, River Development and Ganga Rejuvenation
Sustainable Tourism in Himalayas	Ministry of Tourism
Shifting Cultivation: Towards A Transformation Approach	Ministry of Agriculture
Strengthening Skill and Entrepreneurship Landscape in Himalayas	Ministry of Skill Development and Entrepreneurship
Pan Himalayan Databases for Informed Decision-Making	GB Pant National Institute of Himalayan Environment and Sustainable Development

Annex 2

Link with Sustainable Development Goals

Goals	Relevant targets		Working Groups
SDG 1: *No poverty*	1.4	Equal rights to economic resources and access to basic services	Shifting cultivation; Skill development and entrepreneurship; Sustainable tourism
	1.5	Build resilience of the poor and those in vulnerable situations	
SDG 2: *Zero hunger*	2.1	End hunger	Revival of springs; Shifting cultivation; Skill development and entrepreneurship; Sustainable tourism
	2.2	End all forms of malnutrition	
	2.3	Double agricultural productivity and incomes of small-scale food producers	
	2.4	Implement resilient agricultural practices	
	2.5	Maintain genetic diversity of seeds, cultivated plants and farmed and domesticated animals	
	2.a	Increase investment in agricultural research and extension services	
SDG 4: *Quality education*	4.3	Access to affordable and quality technical, vocational and tertiary education	Skill development and entrepreneurship
	4.4	Increase the number of youth and adults who have relevant skills including technical and vocational skills	
	4.5	Eliminate gender disparities in education and vocational training	
	4.7	Ensure that all learners acquire the knowledge and skills needed to promote sustainable development	
	4.c	Substantially increase the supply of qualified teachers	
SDG 5: *Gender equality*	5.a	Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land … … and natural resources	Revival of springs; Shifting cultivation; Skill development and entrepreneurship; Sustainable tourism
SDG 6: *Clean water and Sanitation*	6.1	Equitable access to safe and affordable drinking water	Revival of springs; Shifting cultivation; Sustainable tourism
	6.3	Improve water quality	
	6.4	Substantially increase water-use efficiency	
	6.6	Protect and restore water related ecosystems	
	6.b	Support and strengthen participation of local communities	
SDG 8: *Decent work and economic growth*	8.2	Diversification, technological upgrading and innovation	Shifting cultivation; Skill development and entrepreneurship; Sustainable tourism
	8.3	Support decent job creation, entrepreneurship, creativity and innovation	
	8.5	Achieve full and productive employment and decent work for all women and men	
	8.6	Reduce the proportion of youth not in employment, education or training	
	8.8	Protect labour rights and promote safe and secure working environments for all workers, including migrant workers	
	8.9	Devise and implement policies to promote sustainable tourism	

Source: UN, 2015

SDG 10: *Reduced inequalities*	10.7 Facilitate orderly, safe, regular and responsible migration and mobility of people	Skill development and entrepreneurship
SDG 11: *Sustainable cities and communities*	11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage 11.6 Pay special attention to air quality and municipal and other waste management 11.7 Provide universal access to safe, inclusive and accessible, green and public spaces	Sustainable tourism
SDG 12: *Responsible consumption and production*	12.5 Substantially reduce water generation 12.6 Encourage companies to adopt sustainable practices 12.8 Relevant information and awareness for sustainable development 12.b Develop and implement tools to monitor sustainable development impacts for sustainable tourism	Sustainable tourism
SDG 13: *Climate action*	13.1 Strengthen resilience and adaptive capacity 13.2 Integrate climate change measures into national policies, strategies and planning 13.3 Improve education, awareness-raising and human and institutional capacity	Revival of springs; Shifting cultivation; Skill development and entrepreneurship; Sustainable tourism
SDG 15: *Life on land*	15.1 Ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services 15.2 Promote the implementation of sustainable management of all types of forests 15.4 Ensure the conservation of mountain ecosystems 15.5 Take urgent and significant action to reduce degradation of natural habitats 15.6 Promote fair and equitable sharing of the benefits arising from the utilization of genetic resources 15.9 By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts 15.a Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems	Revival of springs; Shifting cultivation; Sustainable tourism; Data and Information
SDG 17: *Partnership for Goals*	17.7 Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries 17.18 Enhance capacity-building support to developing countries … … to increase significantly the availability of high-quality, timely, and reliable data	Revival of springs; Shifting cultivation; Skill development and entrepreneurship; Sustainable tourism; Data and Information

Annex 3

No. P. 12018/12/2016-RD
Government of India
NITI AAYOG
(Rural Development Division)

Sansad Marg, New Delhi
June2, 2017

ORDER

Subject: Constitution of Working Groups on Sustainable Development in Mountains of Indian Himalaya Region

With the approval of competent authority, five Working Groups are hereby constituted along with Lead Institutions as Conveners of the Working Groups for Sustainable Development in Mountains of Indian Himalaya Region (IHR) to achieve the identified action points of each thematic area. The terms of Reference of Working Groups are as follows:

SL No.	Working Group (thematic area)	Terms of Reference	Lead Institutions and Members
1.	Inventory and Revival of Springs in Himalayas for Water Security	• To take stock of the magnitude of the problem (drying of spring, quality of water from springs). • To review related policies across IHR to ascertain its adequacy and gaps. • To review existing initiatives and best practices including inventorisation and spring revival by different agencies across IHR. Ascertain to what extent learning from best cases and 8 steps methodology is being integrated into spring work and ways to strengthen it. • To assess challenges faced by the existing initiatives. • To suggest policy and practice actions in short, medium and long term.	Lead Institution-Convener Department of Science and Technology (Dr. Akhilesh Gupta) **Members:** Representative form: Department of Land Resources, Government of India Ministry of Environment, Forest and Climate Change Central Ground Water Board Rural Management and Development Department (Government of Sikkim) Dr. Himanshu Kulkarni, ACWADAM, Pune (NGO) International Centre for Integrated Mountain Development (ICIMOD), Kathmandu

2.	Sustainable Tourism in Indian Himalayan Region(with emphasis on heritage tourism)	To review of tourism & related policies and practices of center & mountain states. To identify best initiatives (policy and practice). To identify policy and regulatory frameworks, financial and institutional incentives and capacity building focus areas that will support sustainable tourism development. To recommend short, medium and long term actions.	Lead Institution-Convener NITI Aayog (Shri Vikram Singh Gaur, Joint Secretary, State Coordination & Tourism) Members: Representatives from: Ministry of Tourism Ministry of Environment, Forest and Climate Change Ministry of Culture Department of Tourism of Himachal Pradesh, Uttarakhand and Sikkim Kanchenjunga Conservation Committee, Sikkim WWF India (Dr. Sejal Worah, Director Programmes) UNESCO, India India Tourism Development Corporation Ltd. (ITDC) International Centre for Integrated Mountain Development (ICIMOD), Kathmandu
3.	Shifting Cultivation: Towards transformation Approach	To consolidate the learning on magnitude of the problem To identify viable best practices having upscale potential To assess of Institutions (Formal and traditional one's) and needs for their transformation to adopt sustainable practices To ascertain to what extent and which "Co-Benefits" could be delivered (to Jhumias and State agencies) To suggest ways to promote transformative approach to shifting cultivation, which combines eco-restoration, food and cash incomes through participatory land-use planning taken up on a scale. Suggest actions in short, medium and long term.	Lead Institution- Convener National Institute of Rural Development and Panchayati Raj NIRDPR-NERC, Guwahati (Dr. R.M. Pant, Director) Members: Representatives from: North Eastern Region Community Resource Management Project (NERCORMP) Ministry of Environment, forest and Climate Change Ministry of Development of North Eastern Region (MDoNER) Ministry of Agriculture International Centre for Integrated Mountain Development (ICIMOD), Kathmandu

4.	Strengthening Skill and Entrepreneurship (E&S) Landscape in Himalayas	To assess magnitude of the problem including youth unemployment and migration, with due consideration of gender. To review policy/best practices built around unique/niche mountain goods and services to build E&S landscape. Also assess new industrial policy to see how it address mountain specificity. To identify potential unconventional areas for skilling and entrepreneurship in Himalaya for scaling up to address issue of migration and unemployment. This may also include software/IT based options in addition to unique mountain goods and services. To suggest strategies/actions for development of Qualification packs and National Occupation Standards (NOS) in niche mountain goods and services. To identify ways of strengthening Public- Private Partnership and Networks of skill/entrepreneurship centers across Himalayas. To articulate comprehensive strategy/ actions building on institutional, policy, market, technology and financial resources (including leveraging of resources) in short, medium and long term to address the issue.	Lead Institution- Convener Ministry of Skill Development And Entrepreneurship (Dr. Jyotsna Sitling, Joint Secretary) Members: Representatives from: Ministry of Environment, Forest and Climate Change, Ministry of Rural Development Ministry of Development of North Eastern Region (MDoNER) North Eastern Region Community Resource Management Project (NERCORMP) Entrepreneurship Development Institute of India, Ahmedabad International Centre for Integrated Mountain Development (ICIMOD), Kathmandu

5.	Data/Information for Informed Decision Making by Multiple Stakeholders	To assess data requirement & availability across multiple sectors/ institutions and gaps for monitoring of key conservation and development issues including climate change, cryosphere, disaster, biodiversity and socio-ecological dimensions, and ways to address the same through cross-sectorial and interdisciplinary institutional collaboration and data sharing.	Lead Institution-Convener G.B Pant National Institute of Himalayan Environment & Sustainable Development (GBPNIHESD) Members: Representatives from: Department of Science and Technology Forest Survey of India, Dehradun Wildlife Institute of India, Dehradun India Meteorological Department Wadia Institute of Himalayan Geology, Dehradun National Remote Sensing Centre, Hyderbad International Centre for Integrated Mountain Development (ICIMOD), Kathmandu

2. The working Groups may co-opt other members as deemed fit to best suit the overall objectives of the Sustainable Development of IHR. They may also utilize the existing data available with the government organizations/universities/research organizations/international organizations etc. as enough data is available rather than doing fresh research for collecting data sets.

3. The Working Groups will submit their report within a period of three months to NITI Aayog. It include one month time for inter-thematic consultations also.

(Neeraj Srivastava)
Director (RD)

(नीरज कुमार श्रीवास्तव)
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To,

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10. Ms. Jyotsna Sitling, Joint Secretary, Ministry of Skill Development and Entrepreneurship, Government of India, New Delhi.
11. The Principal Secretary, Department of Tourism, Government of Himachal Pradesh, Shimla.
12. The Principal Secretary, Department of Tourism, Government of Uttarakhand, Dehradun.
13. The Principal Secretary, Department of Tourism, Government of Sikkim, Gangtok.
14. The Principal Secretary, Rural Management and Development Department, Government of Sikkim, Gangtok.
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Annex 4

Executive Summaries of Five Thematic Reports

Annex 4

Working Group I – Inventory and Revival of Springs in Himalayas for Water Security

Executive Summary

Springs are the main source of water for millions of people and their livestock in the 10 States and 4 hill districts of the Indian Himalaya Region (IHR). Both rural and urban communities depend on springs for their livestok and for their drinking, domestic, and agricultural water needs. There is increasing evidence that springs are drying up or their discharge is reducing throughout the IHR, and indeed, throughout the entire Hindu Kush Himalayan (HKH) region stretching from Afghanistan all the way to Myanmar. Erratic rainfall, seismic activity and ecological degradation associated with land use change for infrastructural development are impacting mountain aquifer systems. It is reported that half of the more than three million perennial springs in IHR States have either already dried up or become seasonal, resulting in acute water shortages across thousands of Himalayan villages. There are also concerns about the quality of spring water. There is dearth of scientific studies that estimate contribution of springs to base flow of large Himalayan rivers. It is evident that springs contribute a large share of base flow, and possibly more than glaciers, ice and snow.

In the past, most water conservation programmes in the IHR and elsewhere were based on the concept of watershed. A watershed is a unit of land where the rain that falls drains out through a common point; in other words, a watershed separates two drainage units. Watersheds are easy to demarcate and hold great appeal for policy makers and implementers alike. However, the watershed concept only accounts for surface water movement over slopes, while movement of spring water, which is groundwater, is determined by underlying geology, and the nature and slope of such rocks underneath the surface. The concept of watershed, therefore, cannot account for water, which travels outside watershed boundaries, through rock beds that slope towards an adjoining watershed. For spring revival, the appropriate unit is the springshed – the unit of land where rain falls (recharge area), and then emerges at discharge point, the spring. Given the folded and faulted nature of Himalayan geology, springsheds often cover more than one watershed; in other words, the recharge area of a spring in one watershed, may lie in an adjoining watershed and spring revival programmes have to be cognisant of this. This calls for a paradigm shift from watershed to springshed as an appropriate unit of intervention in the IHR. This misunderstanding of what constitutes springs, and how they are recharged, led to overall policy neglect of springs, and overall focus of India's groundwater policy remained focused around development of water sources like wells and tubewells in the plains.

In recent years, there has been an upsurge of studies and initiatives to address spring management in India, given the seriousness of the emerging crises around springs. These have been mostly community-centric

initiatives that have looked at distribution rather than regeneration, although they have helped in mitigating the rural water crises to some extent. The concept of springshed management – that is management of the area of recharge of springs, down to the area of discharge, is now getting increasingly well-ingrained in the form of pilots of varying scales across the Himalayan States, and more recently in Bhutan and Nepal. The first systematic initiative was undertaken through the Dhara Vikas Programme by the Rural Management and Development Department (RM&DD), Government of Sikkim, even as smaller pilots using the same concept were being undertaken across States like Himachal Pradesh, Nagaland and Uttarakhand as part of Forest Panchayats constituted under the Forest Act. The concept of springshed management entails that recharge areas be correctly identified through the use of simple field based hydrogeology and community knowledge and appropriate recharge measures are then undertaken to recharge springs. This report summarizes the step-wise methodology that has been developed and tested by various NGOs across the IHR. First developed as a planning tool under Dhara Vikas, the eight-step methodology is increasingly being used and customised through a variety of processes, e.g. the protocol of springshed management in different parts of the HKH through the ICIMOD-ACWADAM partnership.

The Working Group deliberated at length on the terms of references and expected outcomes of the group as outlined in the NITI Aayog's notification No.P.12018/12/2016-RD dated 2nd June, 2017 and came out with several general and specific recommendations. The most important recommendation of the group is to launch a National Programme on Regeneration of Springs in the Himalayan Region. The programme will entail several short, medium and long-term actions.

Short-term actions: Phase I – for first 4 years

The intensive phase (first four years) will essentially include launching the spring revival programme in one vulnerable block in each of the mountain States. This phase will include partnerships and collaborations designed to provide technical, financial and institutional support while building local capacity with the objective of adapting the programme to the local context and enable scaling up from this resource block from the fourth year onwards. Vulnerability will be defined on the basis of spring depletion in spring-dependent regions that are not supplied through piped water supply schemes, e.g. regions in the middle Himalayas with higher population density are likely to be more vulnerable than the higher Himalayas. Strong monitoring and evaluation with proper scientific instrumentation, with the involvement of local Block Development staff, educational institutions and NGOs, must be ensured so that the learnings from the programme are well documented. The outputs of the first phase would be trained manpower, experience in instrumentation, costing templates, training manuals with expertise and experience at the local level. These outputs must converge with specific requirements of the State as well as identifying national level policies needed to scale up such projects. This phase will involve the following broad set of activities:

- Systematic mapping of springs across the IHR States. As the process of springshed management unfolds in one block in every State, basic inventory of all springs must begin and be completed in the first phase itself. Survey of India, Forest Survey and Revenue Survey maps and satellite imageries will be used to develop digital maps and data base with a clear mandate on sound 'ground truth' evidence. The data base

mandate should be very clear and apart from geotagged referencing, must include clear information on the discharge of the spring, water quality and dependency on the spring. A historical narrative on spring sustenance or depletion may also be provided.

- Creation of a web-enabled database/web portal on which the springs can be mapped/tagged. All State government departments, Research and Development (R&D) institutions and NGOs working on springs and spring-shed management will upload data on the web-portal. The software will provide for reconciliation of the data and identification of problem sites and will enable access by the public.
- Capacity building activities, focusing on creation of a cadre of para-hydrogeologists will be needed and can be taken up through Skill India Initiative. Creating trained manpower through multiple partnerships and collaborations will form part of the first phase. The programme could be integrated with National Mission for Sustaining Himalayan Ecosystem (NMSHE) implemented by DST and National Mission on Himalayan Studies (NMHS) implemented by MoEF&CC, scientific institutions and Climate Change Cells in the Himalayan States set up under NMSHE.
- Organising a national level workshop for policymakers and decision-makers in order to sensitize them on the issue of drying-up of springs and the crucial role of spring-shed management in the overall development of the communities must become an annual event during this phase. International participation of experts from ICIMOD and other HKH countries like Bhutan, which are implementing similar programmes should be considered to share experiences.
- Awareness and education of communities regarding spring water management under a changing climate can play a crucial role in springshed management.

Medium-term actions: Phase II – 5th – 8th years

The knowledge – network phase of the following four years will involve handing over the programme to the State governments who can use existing funds (State budget, plus funds generated through Compensatory Afforestation Fund Management and Planning Authority (CAMPA)) to scale up this initiative to other larger areas, making it possible to reach as many springsheds as possible. Some States such as Himachal Pradesh, Uttarakhand, Sikkim, Meghalaya and Nagaland are already piloting spring-revival through a variety of programmes. This work could be leveraged for achieving some scale during the medium-term phase. Such initiatives could be integrated in land use plans that are suggested by other Working Group.

The programme should be integrated with the on-going development activities of the States, whether through dedicated springshed programmes or through a strong link-up with allied programmes such as Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS). The programme would continue to provide scientific inputs and analysis, organize coordination workshops, exposure visits, documentation and function around the short-term pilots, as a knowledge and learning process under the programme. The detailed design and planning will have to be State specific and may therefore deviate from the broad aspects/ guidelines given below.

- Mainstreaming and convergence of springshed management with other developmental programmes will be required to facilitate greater synergies with government schemes at this stage. For instance, a focus on

forest quality in critical water recharge zones of springs is of great significance and such zones have to be protected. In such areas, where aquifer recharge is high, special efforts should be made to provide local communities with access to fuel for cooking (through better implementation of Ujjwala and other schemes) so as to reduce forest degradation. This will benefit recharge in these critical zones, while ensuring effective convergence. Similarly, recharge zones of most critical springs should be protected from infrastructure development through appropriate policies.

- A digital atlas of springsheds could be developed as a clear output in the second phase. This would also help in the periodic assessment of groundwater resources in the country.
- Awareness and education of communities regarding spring water management.

Long-term actions: Phase III – Beyond 8th year

All springs and springsheds would need to be covered during the long-term phase, the duration of which can be decided at the end of the medium-term action plan. Standardisation of the springshed management process would be more or less established by the end of Phase II. However, resources will have to be mobilised for scaling up and reaching out to diverse geographies and communities in a challenging landscape. Hence, the idea of developing a proposal for the Green Climate Fund (GCF) on springshed management covering the IHR is suggested here, in order to access financial resources required for implementation on a large scale. Bhutan is preparing a similar proposal on springshed revival for the GCF. There are newer financial opportunities including development bonds that could be explored. Further, there is scope for mobilisation of resources through instruments such as NMSHE where spring-water conservation could also have a bearing on India's commitments under the global climate change regimes. Moreover, given the dependence of mountain communities on spring water for meeting their drinking water needs, springshed revival contributes to meeting commitments under the Sustainable Development Goals (SDGs), especially SDG 6 (including safe water). The link to SDGs could facilitate multi-stakeholder collaborations required for effective implementation of springshed management.

Indicative actions would involve:

- Linking the livelihoods of communities with interventions related to revival of springs in ensuring the sustainability of such interventions beyond the lifespan of the project.
- Building local institutions and institutional mechanisms for springshed management would include capacity building of communities to undertake such activities in the long-term and also equipping them to take up operation and maintenance. Establishment of a national registry for springs in the form of a Spring Health Card (SHC), to periodically evaluate the health of the springs in time and space could become an established practice to ensure sustained flow of information from one side and crucial guidance, facilitation and hand-holding from the other.
- Awareness and education of communities regarding springwater management.

A Detailed Project Report (DPR) would be needed for developing a National Programme as outlined above. A national level brainstorming will also be required for taking up such an initiative.

Working Group II – Sustainable Tourism in the Indian Himalayan Region

Executive Summary

With its towering peaks, majestic landscapes, rich biodiversity and cultural heritage, the Indian Himalayan Region (IHR) has long drawn visitors and pilgrims from the Indian sub-continent and across the world. The IHR attracts those who seek vistas, adventure, cooler climates in the summer, sport, spiritual solace, peace, and the many cultural assets of mountains. These dynamics have turned tourism into a key driver of socio-economic development. For local mountain people, tourism provides valuable economic and business opportunities and jobs, and for state governments and private entrepreneurs it brings revenues and profits. The 11th Five-Year Plan of India's Planning Commission states, "Tourism is the largest service industry in the country. Its importance lies in being an instrument for economic development and employment generation, particularly in remote and backward areas (e.g., in IHR)". Tourism and hospitality sector directly contributes about US$ 71.5 billion to the GDP (www.ibef.org). Moreover, the 12th Five-Year Plan clearly recognizes pro-poor tourism for inclusive growth.

The IHR encompasses several sensitive and fragile human-environment systems and ecological carrying capacities are a critical factor for tourism development. Tourism development and promotion in IHR should therefore be built around the principles of sustainable tourism as opposed to mass tourism. The prevailing model of tourism in IHR is viewed as a source of environmental damage and pollution, a threat to socio-cultural heritage, a heavy user of scarce resources, and potential cause of negative externalities in society. These internal tourism development dynamics, coupled with the impacts of climate change, are important drivers of change affecting sustainable tourism development in IHR.

Specific negative impacts linked to the current form of tourism in IHR include the replacement of traditional eco-friendly and aesthetic architecture with inappropriate, unsightly and dangerous construction, poorly designed roads and associated infrastructure, inadequate solid waste management, air pollution, degradation of watersheds and water sources, and the loss of natural resources, biodiversity and ecosystem services. Cumulatively, they are affecting long-term tourism development prospects of IHR.

While there is great potential for tourism growth in IHR it must be managed so that it is inclusive (focusing also on marginalized areas and groups) and sustainable (ensuring jobs, promotion of local culture and tourism product) and contributes to achieving the Sustainable Development Goals (SDGs), particularly SDGs 8 and 12. However, the mounting challenges in IHR link to many other SDGs (e.g. SDGs: 1,13,15). On the other hand, sustainable aspects of tourism development in IHR, including carrying capacity of potential destinations, do not find enough resonance in planning long-term investments.

A desk-analysis was conducted to develop a "Framework for Analysis and Actions" for sustainable tourism. The application of this framework allowed us to review the current tourism and key cross-cutting policies, tourism plans and best practices in IHR, existing assessments on socio-economic status and environmental

threats, and finally to build a basic understanding of enabling and disabling trends due to tourism in IHR. Barring a couple of mountain states (Sikkim and Himachal Pradesh), the environmental performance index of IHR is very low. Corroborating this finding, a World Bank survey in 2015 using criteria such as "Ease of doing Business" and "Environmental compliance" found that none of the IHR states figured in the first 10. This suggests that the conditions may not necessarily be favourable for tourism businesses in IHR and that despite the fragility of IHR environmental compliance may have been compromised.

Socio-economic development and conservation of IHR is increasingly challenged by the mass-tourism scenario, which has also a cross-border connect and faces massive climate change related challenges, as well as the conventional problems of huge fiscal deficits, gaps in environmental compliance and very minimal investments to promote sustainable tourism. These problems can get worse if the envisaged tourist load of 240 Million by 2025 becomes a reality. Even states with best practice in tourism (like Sikkim) are equally threatened by mass tourism and its fall-outs, apart from losing forest cover to development.

While some of the advanced states in IHR are already implementing state-of-the-art policies and selected few actions, but mainstreaming and cross-sectoral coherence is yet to be achieved. Given below are the primary set of actions that are recommended based on six categories emerging from 27th June meeting at the NITI Aayog as follows: 1) Institutions and Processes, 2) Capacity Building, 3) Research/Science & Technology, 4) Finance and market, Planning, 5) Implementation and Monitoring and 6) Policy and Regulations.

According to the analysis and the endorsement of the all-state meeting held on 27 June, conceptual, operational and impact-orientation aspects of Sustainable Tourism keeping the increasing trends of tourist flow, management challenges and associated investments in IHR key action agenda points in alignment with above categories are:

- State Planning Commissions must ensure and oversee convergence within the tourism departments and between different sectors to assess and guide on plethora of sustainable tourism aspects and related information viz. Capacity Building, Marketing and Promotion including product development, Standards, Certification and Guidelines, Data Management & Research, and Integrated Destination and Infrastructure Planning and Implementation;
- Updated capacity building packages and follow-up systems promoting sustainable tourism and its packages (Homestays, Rural Tourism, Heritage Management) need to be blended within the curriculum and delivery design of trainings/education institutions (e.g. vocational centres, universities, schools) serving the host of actors and public/private sectors;
- IHR specific awareness and sensitization package for different actors and sectors, including all key service providers and producers and unleash this information through a proactive media campaign and existing travel related websites; all-inclusive Tourism Satellite Accounts for the IHR must be made available as "One window On-line Information" (e.g. information on number of hotels/rooms, tourist sites, parking places, traffic surveillance, waste quantum, number of tour guides, expenditures/impacts made on promoting sustainable tourism);
- Introduction of a "Green Cess" based on eco-certification and in the form of payments from service consumers/state should contribute to increased tax revenues and equitable sharing of that revenue.

Payments for environmental services (PES) such as charging entrance fees might also offer a valuable long term solution within the tourism industry, as tourism relies heavily on the existence of sound natural environments;

- Multi-year destination strategy and associated Business Plans (e.g. Land Use Plans with Landscape zoning concepts, Carrying Capacity assessments and Environmental Auditing of Tourism Service Providers) must be made mandatory and should include a focus on sustainability and sustainable tourism that consists of environmental, economic, social, cultural, quality, health, and safety issues.
- This is extremely important as tourist destinations in IHR are also increasingly known for very disturbing trends such as drug abuse among youth, prostitution, exploitation of labour and uncontrolled land sales, despite states having put in stringent norms for outsiders.

The implementation strategy should be IHR state specific and must be based on business plans that clearly relate to eco-labelling parameters, investment planning, monitoring and evaluation.

The integrated implementation of above business plans and the performance on composite sustainability indicators could then be used to assess the performance of IHR states and incentivize them accordingly. These business plans must also serve as the basis for outscaling and upscaling the learning harnessed from best practices.

Working Group III – Shifting Cultivation: Towards a Transformative Approach

Executive Summary

Managing transformations in shifting cultivation areas is fundamental to agricultural development in the uplands of northeast (NE) India and an important element of the Act East Policy. Transformation of shifting cultivation is therefore key to the thrust for agricultural transformation in the region. While different programmes designed to address the management of shifting cultivation have claimed drastic reductions, both in terms of area under cultivation as well as number of households involved, the Forest Survey of India's reports over the years continue to attribute large scale deforestation and loss of forest cover in NE India to shifting cultivation (FSI, 2015). This suggest a lack of updated and authentic data on the area under shifting cultivation as well as the total number of households practicing shifting cultivation. About 8,500 sq. km of area in northeast India is shown under shifting cultivation (MoSPI, 2014), but there is inconsistency in the data of various agencies. There is an urgent need for accurate and up to date information on shifting cultivation as the design and scale of all future programmes/projects depend on this. Managing transformative change in the context of shifting cultivation requires the active involvement of multiple ministries and agencies.

At the field level, promotion of home gardens (and extended home gardens) by the North Eastern Region Community Resource Management Project (NERCORMP) has resulted in positive outcomes, improving food and nutritional security and incomes for women, while gradually reducing dependency on shifting cultivation. Such initiatives must be encouraged and further supported. Home gardens presently do not figure as a land use category and therefore there are no specific schemes/programmes to promote home gardens. Central and State agricultural agencies must recognize home gardens as a distinct land use category and develop dedicated schemes and programmes for promotion of home gardens, and allocate adequate funds for each rural household in shifting cultivation areas, specially for women. Products from shifting cultivation fields and fallows have market demand and are being sourced for trade through the unorganized sector. State agencies – agricultural marketing, forest development corporations – of concerned states should take steps to formalize, promote and organize marketing of such products. Steps should also be initiated in full earnest for value addition of such products, ensuring opportunities for large scale involvement of rural youth and women. Under-utilised crops from shifting cultivation have potential for being developed and promoted as health foods. Products from fallows can be used for the development of vegetable dyes and other high value products linked to weaving, a strength of upland women. This will address income generation and youth employment while providing a comparative advantage for such products, contributing to several Sustainable Development Goals (SDGs).

The promotion and expansion of settled agriculture such as terrace farming and plantations have come at the cost of regenerating fallows, which would otherwise have regrown into secondary forests. The resultant land use change has long-term implications, leading to loss of vital ecosystem services and land degradation.

Drying of water sources and depletion of soil fertility (and the ramifications thereof) and reduced availability of fuel wood, fodder and wild edibles are serious concerns related to agricultural intensification. Any land use change suggested for transformation of shifting cultivation, therefore, needs to consider its impact on ecosystem services in general and hydrology in particular. Village level perspective land use planning and land zonation must be initiated and each land use plan ratified and honoured by all concerned authorities for future land based activities. A close collaboration on revival of springs can be developed, and the suggested Mission on Spring Water Management (working group I) could include the selected blocks in their first phase of implementation.

Specific actions need to be initiated to facilitate and accelerate the process of transforming shifting cultivation systems. The more salient needs and actions are outlined below:

Capacity building

- As pointed out under capacity building, research needs to focus on opportunities offered by mountain specificities. An area where research needs to be strengthened is in blending traditional knowledge on resource use and management with modern scientific approaches. For instance, building upon traditional agriculture in NE India and understanding their strengths while seeking to find solutions to address challenges brought about because of change. The approaches for transformation – and supportive research and development (R&D) – should not summarily dismiss traditional land use, but try to blend the traditional with the modern and, wherever possible, improve the productivity of existing practices through locally acceptable technological interventions.
- Research should also focus on technology and approaches for value addition of typical or niche products found in shifting cultivation systems. In addition, research should also include development of appropriate farm and processing machineries suitable to upland systems.

Research and technology

- As pointed out under capacity building, research needs to focus on opportunities offered by mountain specificities. An area where research needs to be strengthened is in blending traditional knowledge on resource use and management with modern scientific approaches. For instance, building upon traditional agriculture in NE India and understanding their strengths while seeking to find solutions to address challenges brought about because of change. The approaches for transformation – and supportive research and development (R&D) – should not summarily dismiss traditional land use, but try to blend the traditional with the modern and, wherever possible, improve the productivity of existing practices through locally acceptable technological interventions.
- Research should also focus on technology and approaches for value addition of typical or niche products found in shifting cultivation systems. In addition, research should also include development of appropriate farm and processing machineries suitable to upland systems.

Finance and markets

- Access to credit for shifting cultivators is denied because they are unable to offer shifting cultivation land as collateral for loans in the absence of land titles. Credit guidelines should be amended to allow group guarantee (from village/clan authorities) for loans instead of land title deeds in these areas.
- Products from shifting cultivation fields and fallows have market demand and are being sourced for trade through the unorganized sector. State agencies – agricultural marketing, forest development corporations – of concerned states should take steps to formalize, promote and organize marketing of such products. Steps should also be initiated in full earnest for value addition of such products, ensuring opportunities for large scale involvement of the rural youth and women. Under-utilised crops from shifting cultivation areas have potential for being developed and promoted as health foods. Products from fallows can be utilized for developing vegetable dyes and other high value products linked to weaving, a strength of upland women. This will address income generation and youth employment while providing a comparative advantage for such products, contributing to several SDGs. The Working Group on Skill and Entrepreneurship Development has to develop close synergies in this respect and promote this as an agenda for action in the NE region.

Policy Environment

- Shifting cultivation lands fall under the purview of agriculture during the cultivation phase, but come under Forests during the fallow phase – the same piece of land under two subjects at different time periods. This causes such land to be subjected to different laws, regulations and management, many of which often become self-contradictory and negatively affect the upland farmers, restricting their control, decisions and investments on such plots. This ambiguity needs to be addressed and shifting cultivation lands with long fellow cycle should be categorized as a distinct land use, thus removing their categorization as 'abandoned land', 'wastelands' and 'Unclassed State Forests'. All government departments should consider jhum land as a distinct land use, with an exceptionally long fallow phase. A review of all relevant legal regulations and frameworks should be initiated immediately to develop a solution acceptable to all and respecting the rights of access and management of the recognized tenure holders.
- Shifting cultivation fallows must be legally perceived and categorized as 'regenerating fallows', which may, if given sufficient time, regenerate into secondary forests. Such regenerating fallows add to the forest cover of an area. The practice of shifting cultivation, therefore, could increase forest cover through the regenerating fallows. This fact must be duly recognized and due credit accorded to the practice. The forest cover and forest cover change assessments, in future, need to acknowledge the additional forest cover resulting from regenerating fallows. Relevant authorities also need to categorise shifting cultivation fallows as 'arable, regenerating fallows' instead of the present practice of categorizing such fallows as 'abandoned wastelands' and as 'Unclassed State Forests'.
- Managing transformative change in the context of shifting cultivation requires the active involvement of multiple Ministries and agencies posing a challenging task for coordination and synergetic action. For ensuring effective coordination and strong synergistic action, setting up a "Mission on Shifting Cultivation: Towards Transformative Changes" is proposed under the Agriculture Ministry. The proposed mission should be set up in collabotation with the Ministry of Environment, Forest and Climate Change (MoEF&CC) and

Ministry of Development of North Eastern Region (MDoNER).

- Finally, some of the key elements of the road map to manage transformation in shifting cultivation are:
  - ◊ Launching a mission and setting in motion steps to update and authenticate data/information on shifting cultivation (area under cultivation/fallow and total number of households/population involved),
  - ◊ Encouraging States and relevant Central Ministries to recognise home gardens as a distinct land use category with dedicated schemes and programmes for promotion of home gardens and the promotion of niche crops and other products found in shifting cultivation systems. This will provide income generation and entrepreneurship development opportunities for upland farmers,
  - ◊ Initiating village level perspective land use planning and land zonation and ratification with the objective of improving land use, land use zonation, resource conservation and tenurial security,
  - ◊ Amending credit guidelines to allow group guarantee (from village/clan authorities) for loans instead of land title deeds in shifting cultivation areas, and
  - ◊ Categorizing shifting cultivation lands as distinct land use, recognising that it is both an agricultural and forest management practice conducted on the same plot of land but at sequentially separated times.

Working Group IV – Strengthening The Skill and Entrepreneurship Landscape in The Indian Himalayan Region

Executive Summary

The Indian Himalayan Region (IHR) covers 10 mountain states and four hill districts of India that make up our north and north-eastern borders. It stretches from the mountains in the northern states of Jammu and Kashmir, Uttarakhand, and Himachal Pradesh, to north eastern states of Sikkim, Arunachal Pradesh, Meghalaya, Manipur, Mizoram, Nagaland and Tripura, and the hill districts of Dima Hasao and Karbi Anglong in Assam and Darjeeling and Kalimpong in West Bengal. The IHR is characterised by diverse demographic, economic, environmental, social and political systems.

The IHR presents both challenges and opportunities for skill development and building an entrepreneurial culture. The region has distinct advantages of forest and biodiversity richness, sacred destinations, landscapes of unparalleled beauty, diverse languages and cultures, crafts, agro-ecosystems and niche products that present opportunities for nurturing sustainable development and entrepreneurship. The youth in the IHR aspire for dignified employment. Nevertheless, providing gainful and sustainable employment to these youth continues to be a challenge. Utilisation of mountain specific resources, with a focus on women and youth, can vitalize mountain economies and create new opportunities for entrepreneurship and employment of skilled youth. Skill and entrepreneurship development contribute to achieving the Sustainable Development Goals (SDGs).

It is estimated that only 4.69% of the total workforce in India has undergone formal skill training (MSDE 2015), and possibly less in the IHR states. Mountain specificities of inaccessibility, fragility and marginality creates several challenges for skill and entrepreneurship development in the IHR. These include the inadequacy of training centres, lack of quality assessors and trainers, variance between quality of training and prescribed industry standards, limited awareness of skill and entrepreneurship development programmes, difficult terrain, weak infrastructure, low economies of scale, limited local demand, and lack of market access. Moreover, the National Occupational Standards and Qualification Packs are yet to be fully developed for many of the emerging priority sectors for the IHR as they fall in non-conventional domains.

The Ministry of Skill Development and Entrepreneurship has an overarching mandate to develop the skill and entrepreneurship landscape in the country. Skill training and entrepreneurship development are also supported by several Central Ministries/Departments. In addition to the support from the Central Government, various State Governments in the IHR have launched skill and entrepreneurship development programmes. This creates challenges for coordination, collaboration, monitoring and assessment at various levels. Skill and entrepreneurship development in the IHR needs to focus on supporting emerging priority sectors and suitably empower the executive committee of Skill India Mission at the Centre and similar committees of the IHR States to ensure convergence of central and state schemes/programmes/projects/missions that could boost skill and

entrepreneurial initiatives.

Priority sectors in Himalayas for skill and entrepreneurship development

Based on secondary research and inputs received from IHR states on gaps in skill and entrepreneurship, the working group has identified five priority areas:

- **Agri-entrepreneurship:** This could be developed as a sub-sector within the larger agriculture sector, building on niche mountain products and reinforcing traditional skills with modern technology needs. The products could include off-season vegetables, medicinal and aromatic plants, spices, health food, and mountain handlooms and handicrafts.
- **Sustainable mountain tourism:** Support skill development and entrepreneurship associated with adventure tourism, culture and heritage tourism, wildlife tourism, and rural tourism, including craft circuits and religious/sacred circuits.
- **Ecosystem services based employment:** Afforestation, eco-restoration, use of wood as construction material, new wood based products and assessment of various ecosystem services could provide opportunities to blend traditional skills with state of the art technological innovations to develop an ecosystem services based skill and entrepreneurial landscape.
- **Information Technology enabled services and digital health:** There is a huge potential for creation of skilled employment opportunities for the local youth by promoting ITES in banking, e-commerce, insurance, financial services, healthcare, mobile applications, storage, security and telecommunication.
- **Skilling in construction sector:** Skilled construction workers are needed in large numbers for projects associated with urban development and renewal (e.g. smart cities and public transportation), development of major infrastructure (e.g. hydropower, road transport, power stations and railways), and rapidly expanding real estate sector within the IHR and other parts of India.

Building capacities for skill and entrepreneurship

- **Strengthen network of skill centres across the IHR, including setting up of regional centres:** Develop regional training centres in IHR based on geographical contiguity and standardised training curriculum. Explore strategic partnership between private sector, international development agencies and skill centres in building skills and capacities.
- **Assessors and trainers:** Encourage private and public universities to establish facilities for training of assessors and trainers in the region. Training of trainers in the state-level skill centres will ensure that the trainers are certified for the job roles, which may be either specific to the state or in demand in labour markets that are popular among migrant workers from the state. The States could gain from a structured trainer's programme developed for IHR. The regional training centres could play a key role in developing a training programme for trainers from IHR states.
- **Creating enabling conditions for skilling and entrepreneurship training:** Make relevant Qualification Packs and National Occupational Standards aligned skill based programme as mandatory credits for high school and college students. Increase the number of apprenticeships, scholarships or interest-free loans

for the trainees. This would help them to cover training expenses. Promote higher-order skill training on project management (e.g. managers and supervisors) for candidates with diplomas and graduate degrees. Provide skill training to women – who often find employment in low-skill category – to facilitate their transition to high skilled category.

- **Developing Qualification Packs and National Occupational Standards for mountain specific job roles:** Based on the comprehensive gap assessment, public and private institutions could jointly formulate Qualification Packs and National Occupational Standards for identified priority sectors in IHR. Develop qualified human resources necessary for the development of mountain specific Qualification Packs and job roles.
- **Skilling for migrant workers and returnees:** In places where the local labour absorption capacity is limited, the employment opportunities in other places (i.e. within IHR, other parts of India or abroad) need to be considered. To ensure safe and favourable conditions for workers moving from rural areas to urban centres, it is important to create opportunities for them to transition from unskilled or semi-skilled workers to skilled workers. Moreover, there is often limited scope and several challenges for returnees to use their skills or pursue entrepreneurial ventures in migrant sending communities.

Demand and supply

- Monitor and evaluate training ecosystem on a regular basis to ensure relevance of training curriculum for workers and employers. Conduct a comprehensive gap assessment and forecast of skill and entrepreneurship in the IHR. Strengthen dissemination of labour market information through digital platforms.

Finance

- Raise awareness, strengthen implementation and improve access to schemes such as Skill Development Initiatives of Government of India, Startup India, Pradhan Mantri Mudra Yojana, state level flagship schemes launched by Chief Ministers of Himalayan States, and the schemes of various financial institutions. Incentivize investments in skill and entrepreneurship development by public, private and development organizations, with particular focus on enhancing capacities of vulnerable groups (including smallholder farmers, women headed households and the differently abled) and supporting micro, small and medium enterprises.

Strengthening of institutions, processes and policies

- Empower the executive committee of Skill India Mission at the Centre and similar committees in the IHR states for policy exchange and development, information and knowledge sharing, and concerted support to national actions. This will ensure convergence or leveraging of central and state schemes, programmes, projects or missions that can boost skill and entrepreneurial initiatives. Strengthen cooperation among various stakeholders, including through public-private partnerships, for research and development on skills and entrepreneurship, with particular consideration for priority sectors identified for the IHR and needs of women, youth and marginalized populations.

Planning, implementation and monitoring

- Provide support to IHR states to collect data and establish baselines, in particular disaggregated data. Promote and support gender-sensitive and gender-responsive actions on skill and entrepreneurship development, including improved access to government schemes and programmes. Explore possibility of creating an institutional platform for providing strategic directions and oversight mechanisms for implementation of state action plans.

Working Group V – Data/Information for Informed Decision Making by Multiple Stakeholders

Executive Summary

Mountain ecosystems play an important role in shaping the sustainable development of India. Realizing the importance of the Indian Himalayan Region (IHR) as a unique treasure of environmental goods and services and a rich repository of biodiversity and cultural diversity, and considering its sensitivity to natural disasters and climate change, the Government of India has accorded the highest priority to IHR and safeguarding of Himalayan ecosystems. Sustainable development planning and decision making in the IHR needs information and access to data on important conservation and development issues.

Consultations with member organizations was organized and data and information available with them were obtained. Additionally, information was collected from the websites of various organizations. A structured questionnaire was circulated to 96 institutions and departments of IHR states. Additionally, another questionnaire was circulated to Chief Secretaries of 12 IHR states for obtaining information on state-specific issues and data required for informed decision making to address these issues. Based on the synthesis of the information received/collected from different organizations sector-wise issues, data requirement, availability and gaps were identified. The report is structured into different chapters covering the important sectors/subject areas in individual chapters. The recommendations of the Working Group for different sectors are:

- In the climate change, cryosphere and disaster sectors the report recommends: (i) data collection by increasing number of observational stations, particularly in high altitude areas for better forecasting; (ii) promoting use of space-based observations in the harsh high altitude areas and areas inaccessible for instrumentation; (iii) improve collection of real time data on glacier melt and associated hydrological processes; (iv) documentation of diverse climate change adaptation practices for mitigation of climate change impacts; (v) development of pan-Himalayan disaster vulnerability maps (landslides/forest fire/flood/seismic zone) at block and district level for disaster preparedness; (vi) improvement in IT infrastructure for real time data collection and dissemination for better disaster preparedness; and, (vi) augmentation of facilities and development of a network for recording low magnitude earthquakes.
- In the biodiversity sector the report recommends: (i) collection of location-specific and geocoded data on habitat ecology, population dynamics of biodiversity elements (particularly rare, threatened and endemic species) with edaphic, environmental and climatic attributes; (ii) preparation of biodiversity distribution data at spatial (grid basis) on lower scale/resolution as input for integrative analysis along with related climate, topography, soil, socio-economic data for effective decision making; (iii) documentation of ethnobotanical/traditional knowledge on best practices in biodiversity conservation and sustainable use; (iii) mapping of biodiversity rich (having endemic elements) areas earmarked for their conservation values;

(iv) quantification and valuation of bioresources (such as NTFPs) and their use patterns for estimation of ecosystem services and to promote sustainable use.

- The major recommendations in the socio-ecological sector are: (i) promotion of development research in universities/institutions through involving inter-institutional and inter-departmental collaborations and patronage to institutions mandated for such research so that the decision making on conservation and development issues is facilitated with appropriate information/database; ii) prioritization of key conservation and development issues of IHR and promotion of multi/inter-disciplinary focussed sponsored research on such issues in time-bound/mission mode manner by transforming the existing research culture; (iii) inventory and documentation of the existing TIK on health care, and NRM practices at village/village clusters/and eco-cultural zone levels; (iv) safeguarding IPRs/patent issues and simplified procedures to implement access and benefit sharing of the practicing/custodian community; and, (v) capacity building of planning agencies for optimal use of such data through the specialized nodal institutions.
- The report also highlights constraints related to use of available data, authenticity, compatibility, validation, user charges, archiving paid data, non-availability of unpublished data, and policy regarding time-frame for bringing unpublished data to public domain. Convergence of existing analogue data into digital form suitable for data collection, compilation and access was emphasized. Need for appropriate benefits for data sharing, standardization of data formats, user-friendly data submission tools, formats for different types of data, and compatibility of databases was underscored. Issues such as willingness to share the data, quality of data, and need to overcome duplication of data to utilize the intellectual/capital/material resources in the best interests of the region were raised as major concerns. In this context the Working Group recommended a citizen science approach, which ensures participation of a range of stakeholders for data collection, data compilation and public interface.

The Working Group has provided following recommendations:

(i) The National Data Sharing and Accessibility Policy (NDSAP), Government of India needs to be fully utilized through regular feedback from the designated State and Central agencies; for this purpose a nodal point in the NITI Aayog may be considered to ensure implementation and follow up of NDSAP with amendments as deemed appropriate;

(ii) There is a need to create a "Data Centric Architecture" for IHR to address data gaps, data quality control, data management and data access to end-users for sustainable development planning and decision making. GBPNIHESD has been proposed as an accredited Central Government organization to act as Central Data Management Agency (CDMA) for IHR and given the responsibility to maintain dedicated data centre on IHR. It will receive regular data from sector-specific designated state and central agencies. The linkages with other R&D organizations/universities/voluntary organizations to augment the data through participatory and incentive based approach should be strengthened through funding agencies.

(iii) Harmonizing and digitization of data in terms of scale and formats for its effective use in their planning and decision making is required and accordingly a clause to this effect may be added to NDSAP guidelines.

(iv) Skill and capacity building of various stakeholders including youth be promoted for systematic data generation in gap areas.

Action Points

The actionable points from the Working Group exercise are:

Policy

- There is a need to promote data centric developmental research across universities and research organizations on key prioritized issues in a time-bound and mission mode through inter-departmental/ inter-institutional collaborations by appropriately changing their mandate and academic policy for awarding Ph.D. to a group of students for such projects.
- Decision making requires multidimensional visualization of scenarios and alternatives, and therefore there is a need for promoting a culture of science based policy planning at the State level.
- A mechanism should be built to pool data/information particularly traditional knowledge available at the community level into the central data pool (CDMA at GBPNIHESD) after giving due benefits to data owner.
- Some incentive mechanisms such as incorporating the credit system in assessment policy of researchers should be evolved in institutional policies to bring this primary data/information to public domain and encourage its compilation for various decision making contexts.

Institutions and Processes

- The GBPNIHESD is proposed as the lead agency in IHR responsible for data/information housing, compilation, and access; a separate centre under GBPNIHESD (as CDMA-IHR) could be created for this work and strengthened with adequate trained manpower.
- All the departments, institutions and universities should also have a dedicated data cell to act as a repository of all the data available in their domain; data from such cells could be housed at a state level cell, which would provide information/data to CDMA-IHR through web-linked network. CDMA-IHR at GBPNIHESD would archive the data/information/metadata from different organizations/institutes or otherwise would facilitate the data dissemination to the end users through mutual agreement of data dissemination with other nodal agencies. Moreover, for archiving and hosting the data collected by community/voluntary organizations, GBPNIHESD would also act as the collaborating agency including for traditional knowledge.

Capacity Building

- A large number of the actions suggested focus on capacity building, which would involve training of the decision makers, planners and implementing agencies for optimal utilization of the cross sectoral data/ information for informed decision making.
- Also training of the researchers, other stakeholders and also the community will be required through subject specific programmes and workshops on collection/generation and quality check of field data. In this regard, synergy with Working Group 4 on Skill Building would be essential and beneficial. Some premier institutes of IHR and the country such as NRSC, WIHG, NEERI, IEC, ICSSR, NIH, BSI/ZSI, ICFRE, GBPINHESD, and ICIMOD can also be involved in capacity building.

Research, Science and Technology

- RS-GIS is a very useful planning tool that can help in scenario visualization and guiding decision making on complex conservation and development issues; therefore, there is a need to strengthen the RS-GIS wing in all R&D institutes and universities, and higher courses on the subject should include enhanced application of RS-GIS information/data for decision making. ICIMOD can greatly help by bringing in latest technology for the Centre.
- Establishment of the CDMA-IHR would require setting up Linux based data centre protected by firewalls facilitated with high end server for faster data dissemination. Also the data centre would be equipped with sufficient space using Solid State Drives (SSD) for faster data archival and distribution. A data dissemination geo-portal would be required to link the data centre for carrying out the data management through friendly user interface, for data archival, hosting and dissemination.

Finance and Market

- Setting up of dedicated data centre (CDMA) in GBPNIHESD would require special funding in the form of one time corpus and minimal recurring costs. A project can be submitted to MoEF&CC and other agencies for funds and manpower. ICIMOD being a regional agency can provide help in generating financial support to GBPNIHESD. The state level data centres can be funded by state governments and UGC can leverage funds for university data cells; the respective ministry/state government can also provide fund support to departmental data cells. User charge may be levied for data supplied under the approved benefit sharing mechanism.
- Considering the strong need to make the research more data centric, useful for problem solving and amenable to policy and decision making, all funding agencies like DST, MoES, DBT and MoEF&CC should fund such exploratory research in IHR through existing missions and schemes like NMSHE and NMHS.

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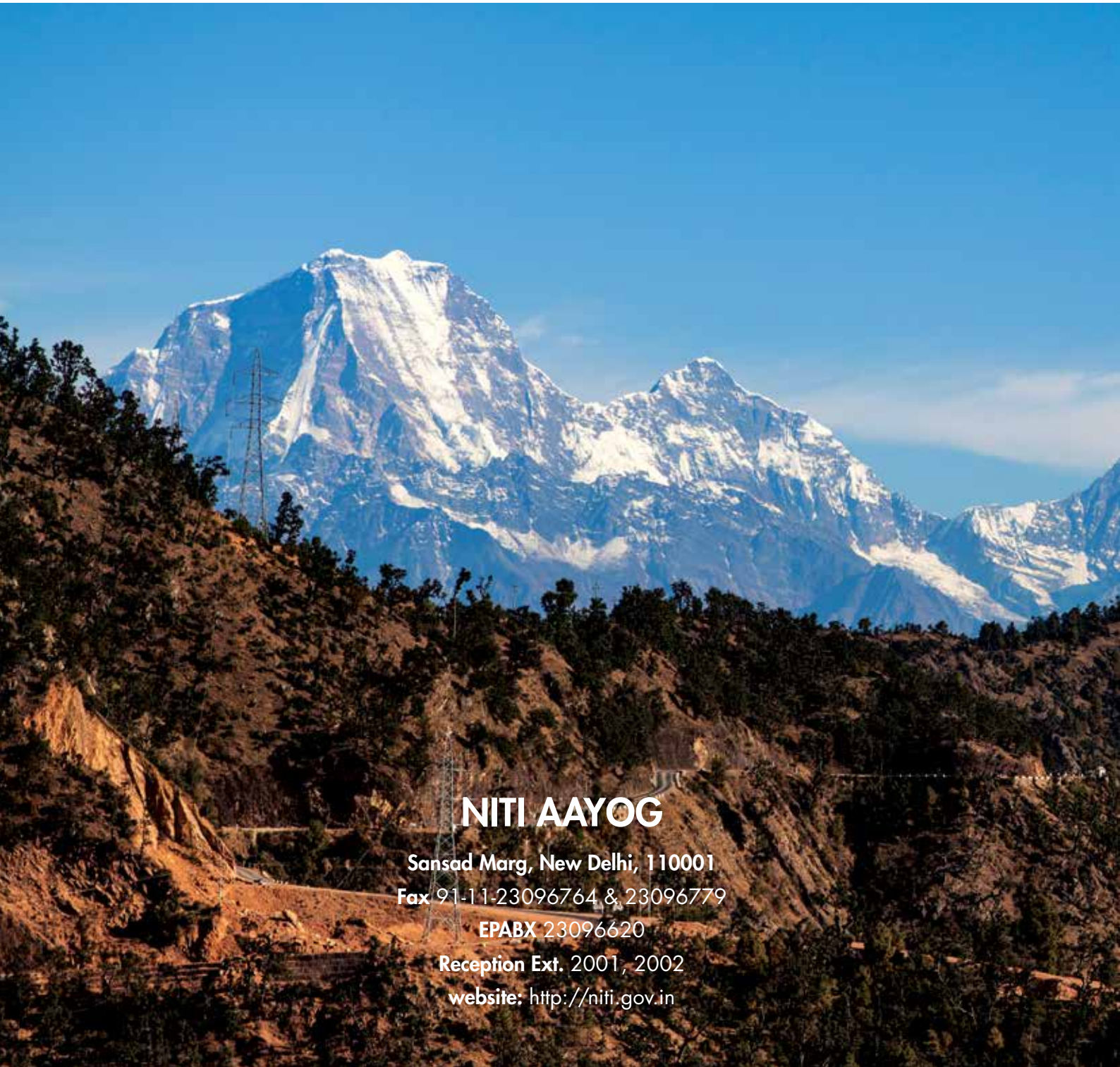

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