The Indian Himalayas Climate Adaptation Programme (IHCAP) is a project under the Global Programme Climate Change and Environment (GPCCE) of the Swiss Agency for Development and Cooperation (SDC), and is being implemented in partnership with the Department of Science and Technology (DST), Government of India. IHCAP is supporting the implementation of the National Mission for Sustaining the Himalayan Ecosystem (NMSHE) as a knowledge and technical partner. The overall goal of IHCAP is to strengthen the resilience of vulnerable communities in the Himalayas and to enhance and connect the knowledge and capacities of research institutions, communities and decision-makers.

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Capacity Building for Climate Change Adaptation Planning & Implementation in the Indian Himalayas
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Recognizing the high vulnerability of the Himalayan region to climate change impacts and the lack of capacities and information, the Government of India launched the National Mission on Sustaining the Himalayan Ecosystem (NMSHE) focusing on a range of adaptation measures. NMSHE is the only mission under the National Action Plan on Climate Change (NAPCC) with a geographical focus.

The primary objective of NMSHE is to develop, in a time-bound manner, national capacity to continuously assess the health status of the Himalayan ecosystem and assist policy bodies in their policy-formulation functions and States in the Indian Himalayan Region (IHR) in the implementation of actions identified for sustainable development.

The National Mission for Sustaining the Himalayan Ecosystem (NMSHE) states that as a national mission, it will focus on the rapid generation of national capacities. This includes:

- Human and knowledge capacities
- Institutional capacities
- Building capacities for evidence-based policy building and governance
- Building capacities for continuous learning and pro-active designing of development strategies

A detailed assessment for identifying linkages between NMSHE objectives and of the various State Action Plans on Climate Change in IHR indicated that there is a clear need for capacity building in the States. Below is table indicating the same:

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Table 1: Comparing NMSHE capacity building linkages in IHR SAPCCs

The regional consultation workshop organized in 2013 for exploring synergies between NMSHE and SAPCCs in IHR further corroborated that capacity building for climate change adaptation planning and implementation was a major need.

Given the above context, it is clear that there is both a need and an explicit articulation for capacity building in climate change adaptation planning and implementation. The objective of this paper is to review and analyze the different activities that are being undertaken under the NMSHE for human and institutional capacity building, and subsequently recommend means for strengthening and scaling up these activities.

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1 Available online at: http://www.dst.gov.in/scientific-programme/NMSHE_June_2010.pdf
2 For detailed report, please contact: info@ihcap.in
Defining Capacity Building in the Context of Climate Change Adaptation Planning and Implementation

CAPACITY BUILDING

The United Nations Framework Convention on Climate Change (UNFCCC) defines capacity building as follows:

In the context of climate change, the process of developing the technical skills and institutional capability...to enable them to address effectively the causes and results of climate change

The above definition identifies capacity building as a process, thus emphasizing a systematic step-wise approach to the concept. It also states that both “causes and results of climate change” are a part. However, the current document restricts itself to the need for adaptation to climate change in the context of IHR.

The above definition also identifies capacity building as being at the institutional level and at the technical skill building level (individual/human). This document will explain both these levels using relevant examples.

Before we move forward, the concepts of climate science (data and information and assessment), climate change adaptation planning and implementation and their linkages need explanation. Thematically, capacity building is dealt with in terms of climate science, adaptation planning and implementation, i.e., the order in which they appear on the adaptation continuum. Although it will be arbitrary to identify climate science from adaptation, it is being attempted for the sake of articulation of the thinking behind the process rather than from being a technically sound classification system. Below is a representation of the continuum with a classification into two broad themes followed by short descriptions of each.

4 Source: http://bit.ly/2sf83PF
5 Adapted from: http://bit.ly/2rTUTHo
As indicated in the above diagram, data and information (both climatic and non-climatic) and assessment process (vulnerability assessment and hazards and risks assessment) form parts of climate science.

Lack of information and data in the context of Himalayas was highlighted for in situ snow cover measurement and its implications for assessment studies in a recent publication\(^6\). The issue of lack of information about the Himalayas has also been highlighted by NMSHE and seeks to build capacities at the institutional level and individual level for improving the status.

In the context of climate change adaptation planning and implementation in IHR, some of the key data and information which are required relate to both natural and socio-economic measures. While the data and information about natural attributes include climatological data, hydrological data, topographical data, land use data, data and information regarding socio-economic attributes include livelihood, income, demography, development indices such as infrastructure, nutrition and access to services (such as financial and information). Capacity building in this context would include imparting the ability to decide which data sets to be used, from where these can be procured/accessed and what is the quality of the data and information gathered.

During the assessment process, the data and information are utilized to assess the vulnerability of the system or sector to climate change impacts. Although a number of frameworks have been proposed for assessing climate change vulnerability, there is a clear need for an integrated risks and hazards and vulnerability assessment particularly for mountainous regions such as the Himalayas.

The diagram below provides an outline of the framework for integrated risks and hazards and vulnerability assessment.

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**Figure 2:** Integrated risk framework based on IPCC SREX/AR5\(^7\)
The purpose of vulnerability assessment is to help in prioritizing sectors, areas or communities and the requisite adaptation actions. For example, an assessment exercise may bring out the critical need for adaptation action in the agriculture sector due to existing and/or projected state of soil moisture.

It is to be further stressed that the quality of the assessment is directly dependent on the quality of data and information available. Other pertinent issues while conducting assessments include the spatial and temporal scale of the assessment, which are in turn, at least in part, dependent on the planning departments and the procedures followed by the administration. Indeed, the aim of capacity building for conducting assessments is to develop the capacities for appropriately using the data and information available and to generate results which are meaningful and helpful in informed and evidence-based decision making.
ADAPTATION PLANNING AND IMPLEMENTATION

Capacity building for adaptation planning and implementation enables interpretation of the assessment results, whether they are in the form of indices or maps, identifying adaptation actions, prioritizing adaptation actions, designing and undertaking monitoring and evaluation of ongoing projects and programmes and developing capacities within institutions to undertake adaptation projects and programmes.

Adaptation planning and implementing adaptation measures (practice) is a major step which will be essential to build capacities at the national and state level. As mentioned, both climate science and adaptation planning and implementation are intricately linked. Quality data and information are an important prerequisite for assessing the climatic vulnerability, and then for prioritizing adaptation options. The link is further enhanced through monitoring and evaluation wherein data and information is collected for further strengthening of both climate science as well as adaptation planning and implementation.

As stated earlier, as per the UNFCCC system, capacity building is classified into the following:

- Institutional capacity building
- Individual capacity building

Figure 3: Diagrammatic representation of the various steps in adaptation planning and implementation
With regards to the institutional capacity building, NMSHE states that it will build institutional systems with long-term memories and organizational structures for long-term observations, studies, understanding and forewarning of changes in the Himalayan ecosystem. The objectives of NMSHE in this regard include a) better coordination among knowledge institutions and b) building new institutions in the areas of knowledge gaps in a time-bound manner. The areas identified for capacity building includes glaciology, traditional knowledge systems, Himalayan agriculture, eco-tourism and biodiversity.

At the institutional level, NMSHE proposes to set up a network of institutions in various key sectors of the Himalayas to lead to coherent database creation which is on par with global standards. The various sectors for which databases are being proposed include natural and geological wealth, water, ice, snow resources including glaciers, forest resources and plant biodiversity, micro flora and fauna and wild life and animal population, traditional knowledge systems, and Himalayan agriculture. Apart from database creation, the task forces under NMSHE will also take part in activities related to establishing monitoring networks, modeling and simulation and vulnerability assessment thus enhancing institutional capacities. Apart from this, as mentioned in the section on human capacity building, glaciologists are being trained with the objective of enhancing capacities in climate science. The tasks forces mentioned in the above section on climate science are also envisaged to take up activities on adaptation policy research and to conduct pilot studies for the purpose of revalidation. Therefore, this will entail institutional capacity building through collaboration.

Institutional capacity is a combination of capacities at various levels including:

- Individual level
- Organizational level
- National systems

At the individual level, capacities include skill and performance of the people. At the organizational level, capacities include managing projects, programmes and emerging situations. At the national level (or systemic level) this translates into networking capacities of organizations to get together on common platforms and to cooperate with each other.

As discussed earlier, capacity building has been described as a process. The figure below provides an outline of the basic steps which when applied to organizations and departments across a given geography contribute towards institutional capacity building.

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8 For details please refer to: http://www.oecd.org/env/cc/21018790.pdf

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Figure 4: Outline of the capacity building process
Under the Indian Himalayas Climate Adaptation Programme (IHCA\textsuperscript{P}) an institutional capacity building programme with the Department of Environment, Science & Technology (DEST), Government of Himachal Pradesh was initiated.

As part of this programme, a comprehensive Training Needs Assessment (TNA) had been carried out with identified key departments. Following review of literature and detailed interactions with various departments, gaps in the existing training programmes were identified.

Based on the identified gaps, a training programme was suggested for various target groups with an aim to integrate climate change concerns and hence adaptation planning in village planning, district planning and state planning.

The TNA Report is available at: http://ihcap.in/media/TNA_HP_Report.pdf
The NMSHE document, within its broader aim of developing India’s capacities for monitoring the Himalayan ecosystem, specifically deals with the issue of human capacity building. This is clearly articulated in the deliverables of the NMSHE as it envisages creating a pool of:

- 100 experts in areas relevant for sustaining the Himalayas
- 25 trained glaciologists within the country.

Human capacity building forms the very core around which the institutional capacities are built. Even while implementing the institutional capacity building programmes for climate change adaptation it is the individuals which need to be trained.

While designing human capacity building programmes in climate change adaptation for the Himalayas, there are a few points which need to be considered. These include:

- Selection of thematic areas for which capacity building is required. This may be guided by assessments and by strategic interests
- Selection of participants for the capacity building programme. This should also focus on geographic representation and gender balance
- Development of course curriculum which is appropriate for the participants and is in line with the expectations of the programme
- Focusing on a balance between classroom teaching and field work in the Himalayas
- Providing opportunities to the participants to enhance their skills further beyond the capacity building programme, which would contribute to institutional capacity building

DST undertook the Indo-Swiss Capacity Building Programme on Himalayan Glaciology jointly with jointly by Swiss Agency for Development and Cooperation (SDC) under the Indian Himalayas Climate Adaptation Programme (IHCAP). The Capacity Building Programme was conducted for two years (2013 and 2014) and consisted of Level I and Level II. The programme was hosted by Jawaharlal Nehru University (JNU), New Delhi. The target group for the training programme was Indian researchers with experience and exposure in the field of glaciology and related areas.

The programme consisted of class room teaching and exercises and was jointly conducted by faculties from Swiss and Indian Universities/Institutions. Based on the assessment, a subset of these students was selected for Level II training programme which along with classroom teaching includes a two week field visit to a selected glacier for hands on training. Faculties from 22 Universities and Institutions in India and Switzerland conducted the programme.

For more details please refer to: http://ihcap.in/glaciology_prog.html
The above report has attempted to highlight some of the various initiatives being taken under NMSHE for capacity building both at the institutional and human levels leading to adaptation planning and implementation. The following recommendations seek to provide suggestions for further strengthening the capacity building component under NMSHE.

- **Promoting Collaborative Research**
  Establishment of an exchange programme with mountain countries having relevant experience, including workshops, trainings, and research activities for Himalayas will aid in sharing expertise, knowledge, experience, skills and technology. There is also a need for collaboration among Indian scientific and academic institutions for climate change adaptation research in the Himalayas. This will contribute to enhanced state-of-the-art research capabilities for monitoring the Himalayan ecosystems.

- **State-Level Capacity Building in Himalayan Region**
  Lessons have been learned in Himachal Pradesh while organizing the Training Programme for Adaptation Planning and Implementation. Taking advantage of this, there is a need to take the state-level capacity building programme to other Himalayan states following adaptation of the content to local context. The support provided to the Himalayan state governments by NMSHE is an existing window of opportunity for this. Building capacities in the Himalayas at the state-level is important for adaptation actions.

- **Deepening Capacities for Glaciology Research**
  The Indo-Swiss Capacity Building Programme on Himalayan Glaciology, consisting of Level 1 and 2, was organized for two years. There is now a need to institutionalize the curriculum, which has been generated as a result of this programme, in the existing courses of the Universities in India. While this has happened to a certain extent in Delhi University and Kashmir University, it needs to be institutionalized in other universities of India as well. This is important as Himalayas continue to remain a region about which scientific understanding is still developing.

- **Promoting young researchers for studies in the Himalayas**
  Himalayas are understudied, partly because of its rough terrain. Against this background, there is a need to promote young researchers working in the Himalayan region and their capacities. The capacity development may include scientific methodologies, developing proposals and writing quality scientific papers for publication in peer reviewed journals. Promoting young researchers and enhancing their capacities needs to be viewed as a long-term approach for creation of knowledge base on the Himalayan ecosystem.

- **Strengthening Platforms for Dialogues between Scientists, Practitioners & Policy Makers**
  There is a clear need for enhancing dialogue opportunities between policymakers, scientists and researchers. These platforms will give an opportunity to scientists to inform policymakers about the latest research, and at the same time, enable policymakers to communicate to the scientists, topics relevant to them and to the society at large.
Capacity Building Through Collaborative Research

Need for collaborative research was highlighted by a research paper which provided the following information:

- India contributes nearly 50% of published scientific peer reviewed articles on issues related to Himalayas
- However, their impact was only a third of the papers published worldwide
- The impact of papers which Indian institutions published in collaboration with foreign partners was much higher than without

Source: http://www.currentscience.ac.in/Volumes/108/06/1053.pdf