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Institutionalising  
Long-term Mountain  
Research: Using  
transects to coordinate  
data sharing



## Why is long-term mountain research important?

The Himalayan region is remote and isolated, but this does not protect it from the global ravages of climate change. Rising temperatures are a threat to biological diversity in this ecologically-sensitive region: its loss will threaten mountain livelihoods and regional security. Good research is needed to plan conservation and development strategies. By institutionalising long-term continuity in mountain research, the countries of the region can benefit from early warning indicators, from the results of global climate change science, and by having the heritage of their biodiversity secured as a resource for the world.

## What data are needed for a better understanding of how climate change impacts mountain biodiversity?

Monitoring change using climatic, physical, and biological parameters, as well as sociocultural and livelihood data, is essential to generate consistent, comparable, and representative data. Basic data requirements include a database of species and ecosystems; an inventory of the distribution range of plants and animals as well as the movement of alien, invasive species; critical landscape and land-use linkages to flagship species; adaptability of entities of biodiversity; and documentation of indigenous knowledge and practices for adaptation to climate change and understanding of ecological resilience. This is in addition to basic knowledge about factors related to climate and climate change per se.

Conservation initiatives active in the region need to be coordinated and policies reviewed to make them more sensitive to linkages between biodiversity and climate change. Economic and socioeconomic studies are also needed to assess what factors characterise community resilience to climate change. Capacity building will be needed to carry out specific research in taxonomy, conservation biology, impact assessment, and livelihood

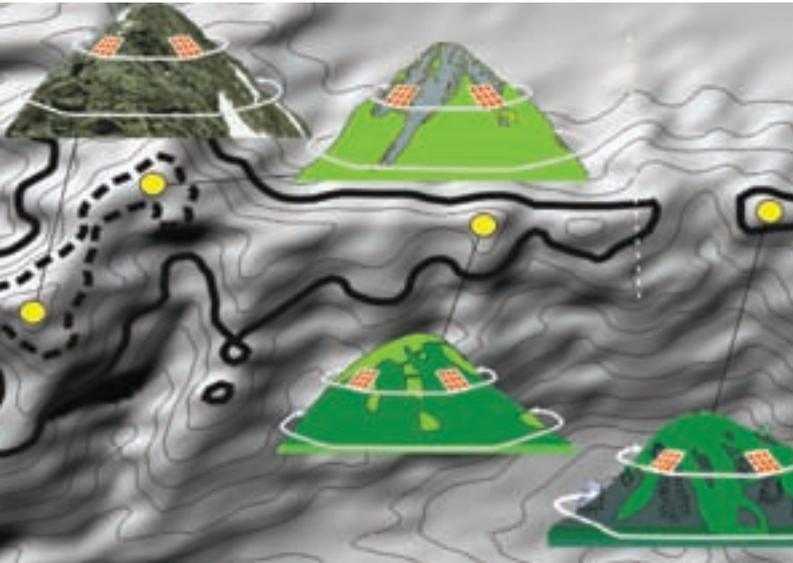
## How has ICIMOD promoted the collection and sharing of scientific data on biodiversity and climate change in the Hindu Kush-Himalayas?

ICIMOD has been a knowledge, learning, and enabling centre for the Himalayan region for the past 25 years. As such, it has fostered sharing of data and information among scientists and policy makers and has contributed to reducing scientific uncertainty about climate change in the region. The International Mountain Biodiversity Conference (IMBC), which took place at ICIMOD in November 2008, provided an opportunity for climate change experts and global programmes to come together to discuss issues with the countries of the Himalayan region and develop a common strategy for conservation of mountain biodiversity.



## What are the benefits of a regional approach?

Sampling design for a summit reference site



The Hindu Kush-Himalayan region is understudied and there is a dearth of information and knowledge about it. The central reasons for this are that research in the poorly accessible, poorly protected, and extreme terrain areas typical of the region is difficult, and that this mountain region is shared between eight different countries. A regional approach is more promising if progress is to be made. The mountain areas of the different countries share the same type of terrain, biological diversity, and climatic conditions and face the same challenges of global change: they also share the fact that none of them has fully benefited from the experiences gained by global institutions and programmes.

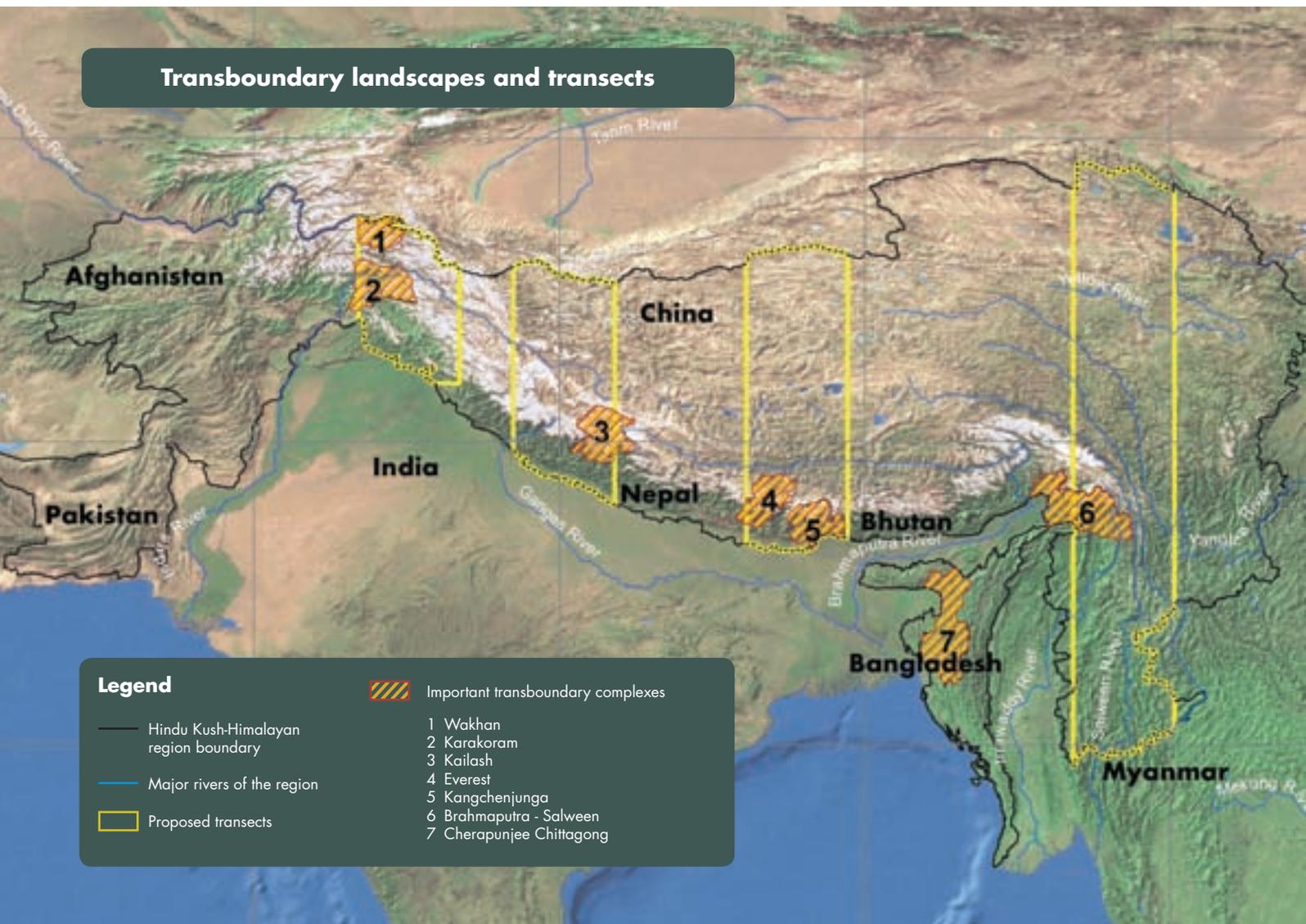
The response of global agencies has often been bilateral and, consequently, fragmented. Global institutions can improve their own knowledge on the specific challenges of mountainous regions by engaging regional institutions which have an in-depth understanding of the underlying issues. Both global and regional institutions stand to benefit from interacting more closely with each other and working together to share, exchange, and develop strategies for comprehensive solutions to the challenges of global change in mountain areas.



# How can 'transboundary corridors' and 'transects' be used to support systematic collection of data in the Hindu Kush-Himalayas?

Seven critical landscapes from east to west, wet to dry, and with low to high-altitude regimes have been identified by ICIMOD as transboundary landscapes. Comprehensive conservation and development strategies have also been developed for some of these complexes at national and regional levels by focusing on biodiversity status and management aspects. Study of a wider range of parameters related to climate change and latitudinal perspectives is not included, however, and additional transboundary areas are needed covering north-south and altitude aspects in 'transect' approaches.

At the IMBC, ICIMOD proposed investigation of the Hindu-Kush Himalayan region by focusing on four representative 'transects' and studying typical test sites within these. These results could then be extrapolated to represent the region. The four transects represent different geoclimatic zones and latitudinal variations essential for studying climate change; and will also serve as a framework for transboundary cooperation in biodiversity conservation. As shown in the figure, six out of seven critical transboundary landscapes are nested within the transects; they account for 32% of the Hindu Kush-Himalayan area. Running from west to east they are the Wakhan, Karakoram, Kailash, Everest, Kangchenjunga, and Brahmaputra-Salween areas. The transects include attributes such as ice and snow cover, wetlands, river basins, hotspots, eco-regions, PAs, IBAs, World Heritage sites, and GLOFs; and include the Global 200 eco-regions found in the Hindu Kush-Himalayas.



## What attributes do transboundary landscapes and transects bring to monitoring? How will the approach be implemented?

The transboundary landscapes and transects include most of the biophysical and sociocultural dimensions: altitudinal (foothills to alpine), latitudinal (north-south), and longitudinal (east-west) coverage; dry and wet situations; and all major types of farming systems. They also include mountain cryospheres, wetlands, potential glacial lake outburst floods, and biodiversity rich areas. Since these areas cover all the eight countries of the Hindu Kush-Himalayan region, they provide an opportunity for cooperation.

Typical test sites will make use of and add to the existing protected areas, national parks, important bird sanctuaries, Ramsar sites, World Heritage sites, critical eco-regions, and transboundary areas. Many of these straddle national and international boundaries and ICIMOD can provide the crucial link between international technical support and national institutions in Himalayan countries. Global programmes have also indicated their willingness to provide the needed technical and infrastructural back-up.

## What are some of the additional benefits of the approach?

Transboundary landscapes and protected areas use regional cooperation to achieve the goal of conservation of global biodiversity. Over the last decade conservation efforts have moved away from enforcement measures towards a more participatory approach. Transboundary approaches provide opportunities to strengthen socioeconomic development among neighbouring countries, facilitating their fulfillment of obligations under international agreements such as the CBD.

## What essential variables should be measured at transect sites?

Interdisciplinary assessment of the impacts of global change on mountain environments did not exist even 10 years ago. The Global Change Mountain Research (GLOCHAMORE) Strategy was created to redress this lacuna in research and to study and monitor the impact of global change in major mountain ranges of the world using a coherent and coordinated approach. The GLOCHAMORE Research Strategy is a blueprint for managers of mountain biosphere reserves and scientists for implementing research on the impacts of global change in mountain areas. It is comprehensive in its aims to study the impacts of global change on the biophysical environment and the socioeconomic conditions of mountain people: in its entirety, it is composed of 10 themes, and 41 sub-themes. The GLOCHAMORE strategy could be the basis for the transect-related research initiatives in the region.

## What role can ICIMOD play?

Currently ICIMOD is engaged in a dialogue with GLOCHAMORE to explore and pursue areas of common interest. Also, since the approach using 'transects' and 'transboundary landscapes' crosses national and international boundaries, cooperation with countries of the Hindu Kush-Himalayan region and global actors can be promoted by ICIMOD by proposing trans-Himalayan transects as venues for coordinated and concerted efforts of data collection, research, and knowledge development. ICIMOD's long history in the region can provide the needed continuity.

Following the IMBC conference, ICIMOD hopes to convene a committee of experts and partners to establish research priorities for funding. The focus will be on those aspects most relevant for understanding and developing responses to long-term change, especially change related to climate and ecosystems. A concept note will be prepared in collaboration with ICIMOD's regional member countries and strong national institutions to agree upon a minimum protocol. ICIMOD will make all the information produced available for everyone to use.