Joint BMUB-ICIMOD Expert Consultation Workshop on Hindu Kush Himalayan Mountain Soils

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Kathmandu, Nepal

Background

Soil management and conservation are critical interventions. They are integral to the delivery of multiple ecosystem services and, in this sense, pillars of wellbeing and co-existence. From a political perspective, they are crucial to achieving the relevant Sustainable Development Goals and from a scientific perspective, there is an increasing acknowledgement of the crucial role soil plays in ecosystem functioning (Adhikari and Hartemink, 2016). The multiple benefits produced from the soil are called soil functions (Blum, 2005).

The Hindu Kush Himalaya (HKH) are the youngest mountain range in the world. Its southern slopes are marked by fragile geology and high sediment rates, while in the Hindu Kush and Tibetan regions, the soil organic matter turnover and mineral mineralization rates are much slower.

While the HKH region has evolved into a landscape of striking beauty, unique and rich in biodiversity, the setting also presents high stakes for the people who live here. The geographical factors of the HKH lead to low productivity across the region and difficult farming conditions. There is decreasing soil biodiversity, with soils demanding wise management. To address these challenges, the International Centre for Integrated Mountain Development (ICIMOD) is teaming with Germany's Bundesministerium fur Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMUB) to organize an Expert Consultation Workshop on HKH Mountain Soils.

Sustaintable Development Goals (SDGs) related to Soil Issues

SDG 2 on Zero Hunger: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.

SDG 13 on Climate Action: Take urgent action to combat climate change and its impacts.

SDG 15 on Life on Land: Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

There are numerous factors that contribute to declining soil fertility in the HKH—landslides, erosion, overgrazing, poor soil management practices, intensified droughts and rainfall, and unplanned urbanization and construction, among others. These lead to serious global challenge for food security and maintaining ecosystems sustainability (Adhikari and Hartemink, 2016). Also the conversion of forestland to other land uses in HKH region is quite high, which results in a decline in soil nutrient content (Sharma, Rai, Sharma, and Sharma, 2004).

The organic carbon stored in soils is assumed to contain twice the amount stored in all terrestrial plants and more than three times that in the atmosphere. Carbon preservation and sequestration in soil thus offers an effective means for offsetting greenhouse gas emissions, while also producing other benefits such as increased agricultural production and improved ecosystem services.

In the post-Paris Agreement phase, the scope of mitigation strategies has widened from an earlier focus on curbing fossil fuel emissions to acknowledging the ameliorative importance of soil carbon sequestration. Thus, soil interventions require better understanding of the carbon cycle, how carbon is emitted from the soil, and how it can be sequestered through reversal processes. This knowledge is particularly lacking today in the HKH, where adverse impacts of climate change are felt more acutely at higher altitudes compared to the lowlands.

Objective

This expert consultation intends to bring together soil experts from the entire HKH region to forge a common pathway for securing soil functions in the mountains. Lessons from this consultation can be linked to ICIMOD's work on mitigation, mountain resilience, and adaptation to climate change. Furthermore, ICIMOD wants to seize the

opportunity to develop its expertise on mountain soils, an issue that is becoming more relevant throughout ICIMOD's regional member countries.

The specific objectives of the consultation are the following:

- To assess the status of soils in the mountain regions of ICIMOD's eight regional member countries;
- To collect best practice examples for reversing land degradation and enhancing soil functions for improved ecosystem services;
- To highlight the role of soil conservation in mitigation and adaptation actions; and
- To demonstrate how soil conservation can lead to fulfilling national and global commitments and conventions (NDCs, UNCCD, UNFCCC, and SDGs 2, 13 and 15).

The consultation will have four thematic areas, all of which are equally important to meeting the objectives stated above:

1. **Carbon sequestration:** Climate change assessment and monitoring; adaptation and mitigation;
2. **Infiltration and recharge services:** Water cycles; eco-hydrology of forests, rangelands and wetlands; upstream and downstream linkages;
3. **Nutrient provision**: Sustainable mountain agriculture; geography of soil nutrients in mountains; conserving soil nutrients—best practices and indigenous knowledge; effects of chemical fertilizers and pesticides; and
4. **Soil degradation and erosion**: Watershed protection; soil degradation and erosion triggered by natural and human factors (landslides, mudslides, earthquakes, climate warming, frozen soil melts, deforestation, overgrazing, intensive agriculture, desertification, and land use change); soil conservation based on ecosystem management.

Expected outcome

This consultative workshop will develop a strategy with a set of action plans to move soil management and conservation from science to practice. Together with representatives and experts from ICIMOD's member countries, the gaps in current scientific research will be identified and pathways developed for ICIMOD to support national and transboundary initiatives on land management and soil conservation.

The consultation will also provide a platform to discuss soil management practices and explore how they can help meet related SDGs while addressing climate change and stipulations from the Paris Agreement. We expect to develop a set of actions specific to

the HKH that will delineate current mitigation and adaptation needs. Outcomes from this workshop will be used as input to develop a full-scale soil proposal for the region, possibly as early as 2019.

Furthermore, we expect this consultation to dovetail productively with ICIMOD's Hindu Kush Himalayan Monitoring and Assessment Programme (HIMAP), which will publish its first HKH-wide comprehensive assessment report in autumn of 2018. The First Assessment Report took inspiration from the IPCC, which cites several data gaps for which improved environmental and socio-economic indicators are needed. The HIMAP assessment includes research and analysis of 15 topics from more than 300 researchers, and we expect it to be just the first of future five-year assessments on the region. In addition, HIMAP will organize thematic assessments in the coming years, as inputs to the second comprehensive assessment round. In the future, we expect soils and related issues to occupy a central place in these assessments.

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