

ICIMOD

MTAP-IV
Medium-Term
Action Plan
2018-2022

International Centre for Integrated Mountain Development

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Preface

I take pleasure in presenting the fourth Medium-Term Action Plan (MTAP-IV) of ICIMOD for the period 2018 to 2022. This document has been prepared following the overall direction provided by our Strategy and Results Framework 2012, which was updated in 2017 (SRF 2017). The MTAP-IV provides ICIMOD with a road map for the next five years to implement our long-term regional programmes.

Rapid change in mountain societies and ecosystems, such as globalization, migration, urbanization, and climate change, sets the backdrop for ICIMOD's future work. While challenging, this change also brings new opportunities for mountains and people. Solutions at the nexus of livelihoods and environment are urgently needed to adapt to change, to support transformative change, and to build socio-ecological resilience for the benefit of mountain livelihoods, downstream people dependent on mountain resources, and overall sustainable mountain development. There is a need to mobilize science to build the evidence base for developing these solutions, to link knowledge with policy and practice, and to make sure that knowledge is put to use.

ICIMOD's key role as a regional organization is to work across boundaries. We share knowledge across borders about common mountain problems, and help mountain communities address transboundary environmental issues like climate change and disasters. This work is important to mitigate the possibility of conflicts at local and regional scales. We believe that regional cooperation will lead to better development outcomes, including peace and harmony in the Hindu Kush Himalaya (HKH).

At the centre of our work are the men, women and children of the HKH and their relationship with the mountain environment. Our mission is to promote sustainable and equitable mountain development, and to focus on gender equality and inclusive development to ensure equitable and productive access and use of mountain resources. Mountain voices and issues need more recognition in policy making at national, regional and global levels. While much of our work is on the ground, we must deliver impact from the community to a global scale.

The purpose of the MTAP-IV document is to provide clear direction on what ICIMOD will do over the next five years, and how we will do it. We have clearly defined our approaches and methodologies for operationalizing and implementing our regional programmes. The sections describing the regional programmes and the themes spell out the broad areas of work and the outcomes we aim for in support of our mission.

In this document, we also provide details on how ICIMOD works internally, including our guidelines for policy engagement, putting research into use, and impact pathways. We explain our leading principles and concepts such as resilience, natural resource governance, and human well-being. The pillars of ICIMOD are captured in the sections on gender transformative change, partnership, knowledge management and communication, private sector engagement, strategic planning, monitoring and evaluation, and finance and administration.

ICIMOD believes that integrated and transdisciplinary work is required to address complex mountain issues. Our themes house our key competencies over a broad range of fields covering the social and physical sciences. Our approach is to draw on these competencies to deliver the programmatic results by working in conjunction with our Regional Member Country partners, who assist us in developing knowledge and site-appropriate solutions through engagement with communities and policy makers.

ICIMOD has identified seven strategic results that will define the success of our work and all of our programmes are aimed at achieving these seven results. These results were drawn from our SRF 2017 and provide a means to document and monitor our performance.

Together, the MTAP-IV and SRF 2017 provide ICIMOD's comprehensive plan for the next five years, both in terms of what we will do, how we will do it, and the financial resources required to be successful. As you review these documents, we would appreciate support in terms of programme and core funding for the work presented.

As a final note, the MTAP-IV was put together building on our 30+ years of experience working on behalf of mountain people and mountain communities in the HKH. To assemble this vision and work plan, we relied heavily on consultations with our Regional Member Country partners and stakeholders. We are especially thankful to our Board of Governors and the ICIMOD Support Group who provided helpful leadership and feedback throughout this process.

David Molden, Ph.D
Director General, ICIMOD

1. Introduction

ICIMOD's work is aligned with its Strategy and Results Framework (SRF), which is periodically revised and translated into a five-year road map called the Medium-Term Action Plan (MTAP). The last plan, MTAP-III, described our work plan from 2013 through 2017.

ICIMOD's fourth Medium-Term Action Plan (MTAP-IV) for the period 2018–2022 has been prepared following the overall direction contained in the revised Strategic and Results Framework 2017. Over the past eight months, ICIMOD has conducted consultations with stakeholders from each RMC. Their suggestions and recommendations were collected to create an informed basis on which to draft our revisions to the SRF 2017 and MTAP-IV. We also solicited feedback from the ICIMOD Support Group, our Board of Governors, and collected external input from stakeholders who provided web-based evaluations.

ICIMOD's overall situation, internally and externally, has changed over the past five years. Regional institutions such as ICIMOD are receiving more attention in the context of meeting the challenges of climate change and sustainable mountain development. Mountain regions are being acknowledged as hotspots of climate change and recognized for the ecosystem services that they provide. However, poverty persists in mountainous areas and the rate of outmigration continues to increase, leaving behind women, children, and the elderly. Significant progress has been made to fill data gaps on these topics, but more research is needed.

ICIMOD is committed to improving the well-being of the men, women, and children in the Hindu Kush Himalaya (HKH). Lessons learned during MTAP-III have been summarized to form the basis of MTAP-IV. We will continue to focus on delivering impact through our Regional Programmes.

Accordingly, the 2012 SRF has been modified in 2017. MTAP-IV has been drafted based on the SRF 2017 and operationalizes our approaches to the Regional Programmes supported ICIMOD's core competencies. This MTAP-IV presents ICIMOD's operational strengths in the following categories:

- Operationalising the SRF
- ICIMOD approaches
- Thematic core competencies;
- Aligning ICIMOD regional programmes with RMC priorities
- Gender transformative change;
- Knowledge management and communication;
- Partnerships;
- Private sector engagement;
- Institutional development
- Financial strategy; and
- Planning, monitoring, evaluation and impact pathways.

In the chapters that follow, we carefully describe each of our Regional Programmes, our approaches, our core competencies, and how we align our programmes with the RMCs. We also note the various pillars of support on which we build our programmes, such as partnerships, finance, monitoring and evaluation, and knowledge management and communication.

MTAP chapters are written in a way that they stand alone in completeness for readers henceforth some intentional repetition has been made.

2. Operationalizing the Strategy and Results Framework through MTAP-IV

2.1 From our Strategy and Results Framework to Action Planning

Based on the MTAP-IV, ICIMOD will generate annual plans that contain more specific details on our activities. This five-year plan provides a vision and structure for organizing activities into action that will lead to specific Regional Programme outcomes and results, which fulfil the strategic aims of the Centre. Our Results Framework, which puts forth ICIMOD's outcomes and indicators for evaluating our work, are presented in Annex 1.

Our Regional Programmes are formulated to achieve several objectives:

- Developing long-term testing, monitoring, and generating finding solutions;
- Developing integrative approaches;
- Creating multi-disciplinary teams to address issues;
- Integrating gender into policy engagement, regional dialogue, and cooperation;
- Providing climate services and monitoring of innovative approaches;
- Building resilience in mountain communities, and the ability to adapt to change;
- Demonstrating transboundary cooperation on landscapes, river basins, and disaster risk reduction;
- Addressing common issues related to cryosphere and impacts downstream
- Addressing regional atmospheric pollution issues;
- Developing regional information and databases; and
- Meeting capacity building needs in the region.

ICIMOD relies on six Regional Programmes (Adaptation and Resilience Building, Transboundary Landscapes, River Basins and Cryosphere, Atmosphere, Mountain Environment Regional Information System, and Mountain Knowledge and Action Networks) to deliver impacts to the Regional Member Countries (RMC) of the Hindu Kush Himalaya (HKH). Our Thematic Areas provide human resources with specialized competence in four broad areas: Livelihoods, Ecosystem Services, Water and Air, and Geospatial Solutions. While our thematic competencies focus on developing knowledge on individual disciplines, the Regional Programmes focus on developing integrative knowledge products and delivering impacts (see Figure 2.1).

In MTAP-IV, specific efforts will be made to upscale the results and lessons learned from our work in the HKH during MTAP-III. Private sector partnerships for both innovations and upscaling will receive focus. Country specific priorities identified in this document will receive special attention in programming and implementation. Our results framework shall be operationalized through four pillars support: financial management, partnership management, monitoring and evaluations and Impact Pathways, and Communication and Outreach. ICIMOD will only take on new projects if they contribute to our Regional Programmes. However, new ideas will be groomed and promoted through various means such as our innovation fund. ICIMOD's work in the HKH will be used to advocate for causes and investments in international fora on behalf of mountain people.

Our programme design, implementation and monitoring will be based on ICIMOD's strategic orientation principles of integration, policy, private sector partnerships, national ownership, gender integration, and regional cooperation.

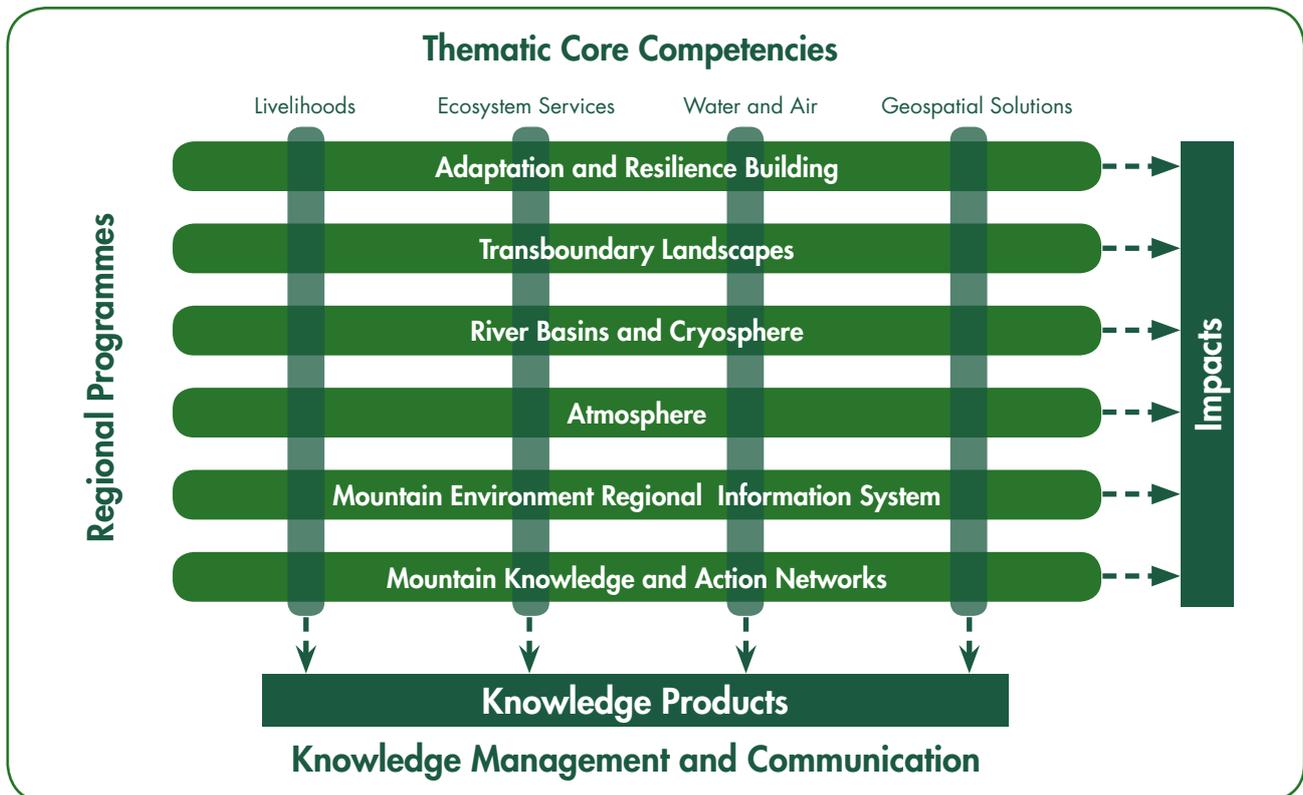


Figure 2.1: ICIMOD thematic core competencies integrated across our regional programmes

2.2 Building on the Learning and Experience from MTAP-III Implementation

ICIMOD seeks to continually improve its standing as a learning organization adapting to a changing environment. ICIMOD's Strategy and Results Framework 2017 and MTAP-IV were built upon the Centre's experiences and lessons learned the five years of MTAP-III and its 34 years working in the HKH. We summarize those lessons here.

We have learned from self-reflection, guided and facilitated by input provided by our RMC partners, Board of Governors, and the ICIMOD Support Group (ISG). As well, we applied recommendations from our quinquennial review (QQR) and external gender audit of 2016 to develop our plans for the next five years. The write-ups in this MTAP document are based on that cumulative experience.

Achieving strategic results

Overall, ICIMOD has made significant progress on six strategic results outlined in MTAP-III. Some of the lessons learned are as follows:

- Many innovations through action results and piloting have emerged in the past five-years. However, upscaling and streamlining these innovations with RMCs are major challenges for the future. The piloting approach needs to keep local benefits in mind while aiming for regional learning and upscaling, both horizontally and vertically (see section 3 for more detail on our approaches).
- As a strategic result, we emphasize putting generated data, information and knowledge into "use." We have improved our skills in this regard but more effort is required to link that action to the results level through the "use" of data. Continuous user engagement and capacity building will be extremely important in coming years. For this reason, ICIMOD needs to keep abreast of the latest innovations and emerging technologies that will enhance our capabilities. We are adding climate services as a dimension of our work that includes significant emphasis on user needs and priorities, and mechanisms to meet user needs.
- ICIMOD's stakeholders are diverse and capacity building in the programmes should reflect this diversity. We recognize the training alone is insufficient; there must be institutional development and

institutional capacity building to enhance uptake as well as demand for our work. To accomplish this, ICIMOD will continue to refine its approach for understanding its users and partners and their needs.

- Policy engagement received special attention in the last MTAP. There were some good policy level interventions in the RMCs, but policy inputs in MTAP-IV will require an improved systematic approach and engagement of policy champions in each of the RMCs will be helpful. We need to continue strengthening our work in this area, and engaging new actors such as Ministries of Finance and Planning Commissions in each country (see section 3 for more detail on our approaches).
- With assistance from ICIMOD's programmes, regional cooperation has improved on topics such as transboundary landscapes, and regional flood information system and regional assessments. However, initiatives focusing on local activities should develop more clear strategies for how such activities are linked to regional cooperation dimensions.
- Mountains received some recognition in SDGs, CBD, IPBES, GEO-6, and UNEA during the past decade. However, these global mechanisms have not been successful in bringing more resources and investments to mountain regions, particularly the HKH. More advocacy work will be required with regional governments to draw investments to our region.

Bringing gender transformative change

During MTAP-III, ICIMOD integrated gender considerations into all its programmes and initiatives, and we will strengthen this focus in future programming with the view of achieving strategic results for gender and inclusive development. However, we recognize there is a long way to go for transformative change and gender equality. To address this, ICIMOD has made the significant step to include gender and inclusive development as a strategic result that we promise to deliver.

In addition, ICIMOD will:

- Enhance its analytic capacity on gender during the next framework;
- Integrate gender across programmes, and make sure that gender issues are included in policy engagement; and
- Continue our institutional gender audits as a recognized good practice.

ICIMOD's strategic positioning

In MTAP-IV, we will continue work to position ICIMOD as a regional institution to meet diverse national priorities and to support the mountain agenda. While ICIMOD has made great strides, certain challenges remain:

- Achieving regional solidarity around mountain issues
- Rising expectations from ICIMOD
- Availability of long-term flexible funding to meet needs as they arise

For this MTAP, ICIMOD will take several approaches to strengthen its niche as a regional organization, including

- Strengthening HKH regional activities, networks, and programmes that include all countries, such as HUC and HIMAP. We have modified our sixth regional programmes to address this need;
- Developing regional cooperation processes and bodies such as the HKH Science-Policy Dialogue, and the HKH Partnership for Sustainable Mountain Development.
- Continuing to develop and apply regional frameworks across different countries within programmes; and
- Following up on past success in enhancing transboundary cooperation when dealing with topics such as floods, biodiversity and protected areas, while other topics such as water sharing remain difficult. ICIMOD can use the topics where we have had success to develop partnerships and networks to build trust to help address the more difficult topics.

Bring HKH issues to global mountain discussions

ICIMOD needs to engage in global dialogues to place mountain issue on the global agendas such as UNFCCC, CBD, and the SDGs. While the QQR commended ICIMOD on its global outreach, we feel it can be better. Moreover, we found that attending meetings like UNFCCC COP requires significant resources, and does not produce commensurate returns on the investment.

We will address these concerns by:

- Being more strategic in our engagement and messaging at global meetings and dialogues.
- Engaging our regional partnerships more strongly to bring these messages forward and build global partnerships.

Fostering partnerships

ICIMOD relies on partners to achieve its strategic results, and a significant portion of our expenditure goes to our partners through which we achieve our shared objectives. In the MTAP-III, ICIMOD developed partnership strategy and guidelines. To improve our partner relationships, we established a unit specifically to focus on that aspect of our external relations: the Strategic Cooperation Unit. We learned many lessons over the past five years and ICIMOD plans to build on the following lessons during the MTAP-IV:

- We recognize that we can become more effective through our partnerships. Programme implementation demands an integrated approach of strategic partnering, monitoring and evaluation, communication and outreach, and financing.
- Partnerships can be complex. We engage institutions of many types – research, academic, governmental, and non-governmental. This variety requires that we acknowledge all our partners may not share our approaches to gender, impact pathways, regional orientation, field implementation, and financial management. We recognize that we may have lessons to learn from their individual orientation to these issues and we remain open in that regard.

To address these concerns, we will increase our efforts to create more effective partnerships during MTAP-IV through:

- Adopting an approach to partnering that includes methods like partnership brokering;
- Developing initial investments in partnership building at the initiative level. Doing this will set the stage for effective initiative implementation, and improved monitoring and evaluation of partner relations;
- Increasing our engagement with partners in the field;
- Providing training to our partners, as necessary on topics like partnering, gender analysis, and financial management; and
- Continuing to build and improve our due diligence and financial control systems related to partners.

Increasing scientific credibility for evidence-based policy

During the past decade, there have been many controversies in relation to the HKH, such as the controversy on 'glacier melting'. The general conclusion is that good scientific information is lacking for the region. The lesson learned from the debate is that ICIMOD and its partners should increase their scientific credibility to support evidence-based policy-making in the RMCs and interface with relevant global agencies. There has been good progress in the MTAP-III on enhancing scientific quality, credibility, and inputs to policy; however, this needs to be continued with greater emphasis in MTAP-IV.

Integration and multidisciplinary approaches in regional programmes

In MTAP-III, regional programmes evolved in response to the need to address complex issues with holistic approaches that required integration for achieving results. We also realized that the interfaces between natural and social sciences, science and policy, policy and practice, mountains (upstream) and plains (downstream), and national and local benefits of development could only be addressed by adopting

transdisciplinary and multidisciplinary approaches. ICIMOD developed and implemented regional programmes during last five years that follow transboundary, regional, multiple-scale, multidisciplinary/transdisciplinary, and people-centred approaches. This approach requires us to work across various ministries and with various stakeholders. This situation poses both challenges and opportunity to promote shared understanding and cooperation.

Regional documentation and knowledge sharing

Climate change, disasters, the impacts of climate change on the cryosphere, water availability, and biodiversity losses have become topics of regional concern especially in past decade for the HKH. Regional information and metadata availability have come to the forefront as issues that need immediate attention. Baseline information and regional-level information were lacking. In recent years, ICIMOD has generated regional information on glaciers, snow and ice cover, and glacial lakes and state-of-the-art reports on climate change impacts, protected areas, the biodiversity policies, and practices of its eight RMCs, mountain poverty, and migration. More comprehensive and systematic information is needed for the region and beyond, and in MTAP-III, the Centre worked on HKH Monitoring and Assessment Programme to meet this need. To fill the regional data and information for regional understanding and learning ICIMOD in MTAP-IV shall continue to emphasise on regional data generation, synthesis, and sharing. Data sharing in transboundary poses challenges but improving particularly with entry points like – disasters, climate change and so on.

Theory of change and impact pathways

During MTAP-III, ICIMOD realized the importance of capturing impacts more systematically in order to assist in the development of future programmes by the RMCs and for effective monitoring and evaluation. The concept of theory of change and impact pathways planning has been executed for all initiatives during the past three years. Identifying and demonstrating the changes resulting from ICIMOD's work is extremely important, however more efforts are required to embed impact pathway approaches in partner M&E systems. ICIMOD will give more attention to partner's capacity building in partners M&E system with impact assessment capacities.

Impact of exchange difference in fund management

One of the major lesson in the area of fund management during the current MTAP-III period has been the impact the foreign exchange difference in the amount of US dollars actually realized in different contracts. As the US dollar has risen against almost all major currencies, ICIMOD fell 11% short of its funding target in MTAP-III. In the new MTAP-IV period, we will ensure that necessary measures are put in place to minimize such impacts currency exchange. For one, the treasury function will maintain diversity in currencies at the HQ level. Secondly, we will enter into contracts with implementing partners in the same currency in which the contract with the funding partner is signed, so that the exchange difference, if any, will be shared by the implementing partners as well. Third, we will request our funding partners for contracts in US Dollars as far as possible. And four, all funding proposals will ensure provisioning of required flexibility to address such unforeseen differences.

Learning from the quinquennial review

In 2016, The ICIMOD Board and Support Group commissioned an independent five-year review called the quinquennial review (QQR). The review generated ten major future recommendations, all of which inform our plans in MTAP-IV:

- Strengthening its country engagement through detailed partnership and communication strategies (see chapters 8 & 9 on communications and partnerships);
- Working closely with its member country focal points to further strengthen its alignment with national priorities through continuous consultation and engagement (see the country priorities in chapter 6);

- Developing a framework for scaling up our regional programmes, which would include internalisation of these ideas by staff and operationalization through joint planning with country partners (see section 3.3 in chapter 3);
- Strengthening ICIMOD’s programmatic cooperation through strategic alliances with multinational organisations for leveraging knowledge, developing capacity, and integrating innovations into development processes in the HKH (see chapter 9 on partnerships);
- Monitoring trends and statuses in regional mountain conditions and linking these observations to policy making processes in the HKH (see section 2.6 on HIMAP and section 5.5 on MENRIS);
- Fostering effective private and public sector engagement with relevant actors who are mandated to promote appropriate technologies to address challenges to mountain people in various sectors (see chapter 10 on private sector engagement); and
- Working closely with the ICIMOD Support Group (ISG) to develop a business plan for attracting more flexible core funding.

2.3 Linking Programmes to Strategic Results and Impact Areas

For MTAP-IV, ICIMOD will work through six Regional Programmes to achieve its seven strategic results, which are expected to make positive impact in three areas: reduced poverty, reduced physical and social vulnerabilities and improved ecosystem services. The current SRF identifies seven strategic results, which provide a clear translation of ICIMOD’s mission for achieving its long-term objectives. These strategic results are linked to strategic impacts supported by outcomes from the Regional Programmes (Figure 2.2).

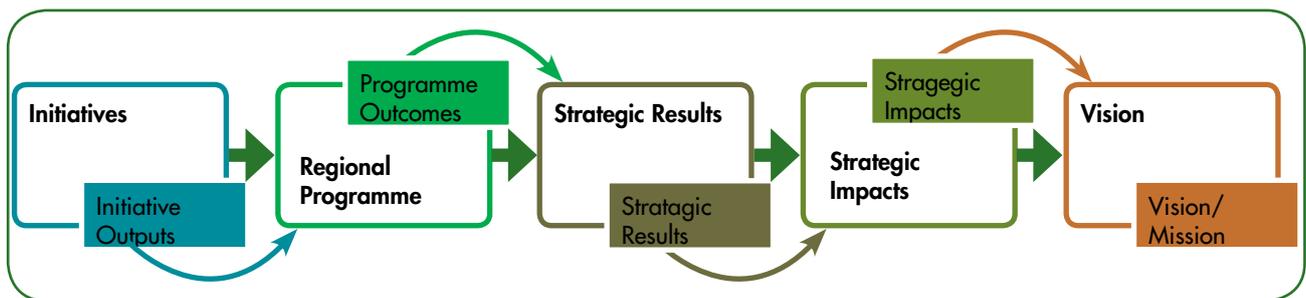


Figure 2.2: ICIMOD results pathway

Regional programme outcome indicators are mapped in relation to each strategic result. Key measurement indicators (KMIs) will be introduced to capture the regional programmes contributions to the strategic results. The initiative level result framework and Theory of Change, developed at the operational level, will be aligned to the corresponding regional programme results and their potential contribution to the regional programmes outcome indicators will be mapped. Through strategic monitoring and evaluation, data will be systematically collected, compiled, analyzed, and reported to determine how these contributions enable higher level results.

2.4 Stakeholder Consultations Process

Over the past eight months (July 2016-February 2017), ICIMOD has conducted consultations with stakeholders from each RMC. Their suggestions and recommendations were collected to create an informed basis on which to draft our revisions to the SRF 2017 and MTAP-IV. We also solicited feedback from the ICIMOD Support Group, our Board of Governors, and collected external inputs from stakeholders who provided web-based evaluations.

Inputs from the ICIMOD Support Group were received in combined form and individually. Members of the Programme Advisory Committee and full Board provided input to the first draft of the Strategy and Results Framework and MTAP-IV outlines. The process was helpful to build confidence among our supporters, partners, and RMCs. ICIMOD staff participated extensively in the process and was involved in internal strategic discussions.

ICIMOD conducted an online survey soliciting feedback on for the SRF 2017 from its network of partners around the world. Ninety-one organisations completed the survey.

The inputs of the consultations and comments were used to revise SRF 2017 and in the preparation of MTAP-IV.

In the section below, we summarize the country consultation process. ICIMOD has conducted country consultations for preparation of revision of “Strategy and Results Framework 2017” and MTAP-IV to seek input and guidance from regional governments and a diverse network of partners in all of its eight RMCs. Given the rapidly changing development scenarios both at the regional and global contexts, these consultations were initiated to identify opportunities for ICIMOD interventions that are of regional significance, to appraise the validity of on-going programmes and lessons learned, and to ascertain the most appropriate levels of effective partnerships for the implementation of the next plan. The main objective of the country consultations were as follows:

- To consult on revision of the ICIMOD’s Strategy and Results Framework and get inputs of its current and future potentials of regional programmes and capture country priorities;
- To develop better understanding of relevant national policies and programmes and RMC’s positioning in the emerging global context such as UN-SDGs and Paris Climate Change Agreement;
- To determine areas for collaborative action of mutual and regional significance, and enhance systematic cooperation and closer interactions with national partners; and
- To provide a platform to engage with existing and new partners and explore ideas to strengthen partnerships including the private sectors.

The country consultations were held jointly with the focal ministry or agency in each RMC. This partnership reaffirmed the ownership of ICIMOD by stakeholders in the region. The country consultations were attended by government agencies, non-governmental organizations, academic and research organizations, development organizations, community-based organizations, civil society groups, and private sector entities involving 314 institutions and 535 participants.

The participatory consultation process with the RMCs aimed to enhance ownership by our stakeholders and further concretize the ICIMOD’s engagement with a diverse network of partners in the region. The country consultation programme was designed to receive feedback and input from a network of partners including (a) key priorities, opportunities and national perspectives, (b) on-going programmes and future outlooks, and (c) key messages for ICIMOD for its Strategy and Results Framework and MTAP-IV.

2.5 Principles of Engagement

ICIMOD adheres to key principles of engagement in order to be an effective regional organization that facilitates evidence-based sound policies and practices for sustainable and resilient mountain development in the HKH. To ensure a consistent alignment of RMC priorities and opportunities, the principles of engagement underpin the major programme activities of ICIMOD in the region. They are:

- **To build on existing institutional mechanisms and partnerships** by capitalizing on strengths, interests, capacities and value addition;
- **To focus strongly on policy orientation** by engaging decision-makers for policy uptake for mountain and downstream communities;
- **To develop synergies for greater developmental impact**, including partnerships with national investments projects;
- **To build private sector partnerships** for up-scaling potentials to ensure sustainability, innovations and impact of the activities;
- **To communicate effectively and increase the visibility** of ICIMOD in all RMCs;
- **To generate principles of social inclusion and gender equity** followed by all engaged at all levels;

- To provide open access to information as a public good commodity to influence mountain development; and
- To maintain a zero tolerance policy towards corruption and fraud.

ICIMOD works with and through diversified networks of local, national, regional, and international partner organizations. The principles of engagement are needed to ensure actions and messages are effective and sustained, have a strong policy and practice impact, and leverage the capacities of the RMCs based on the key partnership principles. ICIMOD has adopted the Partnering Approach that provides the basis of programme operations for delivering impacts, managing partner relationships and minimizing institutional risks. ICIMOD believes that partnerships, if they are to be successful, must be grounded in the key principles of synergy, equity, transparency and mutual benefit.

Synergy means ICIMOD and its partners pursue a shared vision and that the partnership is designed on the assumption that the sum is greater than its parts. It also means for ICIMOD, that its innovation, knowledge, and best practices are most effectively upscaled in synergy with national policies and programmes.

Equity means a commitment to justice, fairness, and even-handedness. For ICIMOD, this means that all partners of ICIMOD, irrespective of the transaction volume, have equal right to be heard and to contribute. It means that ICIMOD will hold itself accountable as much as it does its partners. It also means that ICIMOD and its partners will each contribute to the partnership from their areas of competence and strength, and will respect and uphold each other's commitments.

Transparency means that ICIMOD will be open and honest in its dealings with partners, will not intentionally withhold information, and will make decisions based on dialogue and mutual understanding. Transparency is key to building trust, which, in turn, ensures accountability in partnerships.

Mutual benefit recognizes that different partners may be involved in projects initiatives for different reasons. For ICIMOD, it is important to be able to discuss and recognize each partner's individual reasons for being involved in the partnership, and ensure that these are met. When mutual benefit exists, there is greater possibility that partners will continue to engage and look for solutions, even in difficult situations. Programmes are likely to be more sustainable as a result.

Research publication ethics and authorship

All ICIMOD staff have ethical obligations with regard to the publication of ICIMOD research, in particular concerning authorship. All authors must meet two of four authorship criteria: inception, data collection, analysis and writing.

ICIMOD strongly discourages the practice of including guest authors (those who do not meet authorship criteria but are listed due to their seniority, reputation, or supposed influence) and gift authors (those who do not meet authorship criteria, but are listed as a personal favour or in return for payment), and excluding ghost authors (those who meet authorship criteria, but are not listed) on ICIMOD publications, including journal articles and other publications with partners.

Additional ethical points guide our publications:

- The research being reported should have been conducted in an ethical and responsible manner, should comply with all relevant legislation, and should benefit or promote the research subjects, and not harm the well-being of research participants.
- The use of personal and identifying information of research participants is discouraged and may only be allowed if explicit approval has been given by the research participants.
- Researchers should present their results clearly, honestly, and without fabrication, falsification, or inappropriate data manipulation.
- Funding sources and relevant conflicts of interest should be disclosed.

Open Access

ICIMOD insists that its publication be open access (free access) – whether published in-house or in external publications such as journals and/or technical magazines. ICIMOD believes that open access to timely and high quality research output and knowledge products by its member countries and the wider regional and global community will inform, promote, and accelerate learning on the challenges facing mountain ecosystems and their people.

The free availability of our research output will catalyse the development of knowledge products and innovations that improve the well-being and livelihoods of mountain communities; and empower critical and urgent decision making and efforts at times of emergency, disaster, and humanitarian crisis.

2.6 Climate Risk Reduction and SDG Consistent Priorities for Mountains and Peoples of the HKH

Three global processes of great importance to the HKH converged in 2015:

- The adoption of the 17 Sustainable Development Goals (SDGs) at the 70th UN General Assembly;
- the Sendai Framework for Disaster Risk Reduction 2015-2030 (Sendai Framework); and
- the Paris Agreement of the United Nations Framework on Climate Change Convention (UNFCCC).

The increase in global average temperatures has been disproportionately higher in the HKH due to elevation-dependent warming. The increasing awareness of climate change impacts on mountains, mountain ecosystems, and mountain communities, make it imperative for mountain perspectives to form an integral part of global agendas for sustainable development in the context of climate change. That means not just highlighting the vulnerabilities and fragilities inherent to mountain locations, but also emphasizing the resilience and strengths that mountain people and communities can offer to confront these challenges.

There is significant scope for building synergy between the SDGs, the Sendai Framework for DRR and the Paris Agreement to strengthen policies and strategies for integrated mountain development. This would increase resilience to climate change and reduce risks from natural disasters and climate change impacts. Developing these synergies will also have long-term implications for international, regional and national policies for economic growth, social development, and environmental conservation. For the HKH, the convergence of these three processes offers an ideal opportunity to meet the development, environmental, social and climate change challenges faced by mountain people of the HKH.

If urgent actions are not taken to address climate change, improve disaster risk reduction, and attain the SDGs, this inaction will undermine many recent development gains and increase poverty and inequality in the HKH. Climate and disaster risk reduction is a central challenge for the countries in the HKH, and ICIMOD has an important role to play in supporting its member countries this regard.

All eight of RMCs are committed to achieving the SDGs. Most of the 17 SDGs align with ICIMOD's priorities, and mountains are specifically mentioned in two: 'Clean Water' and 'Life on Land'. The balanced approach to the economic, social, and environmental dimensions of development across the SDG agenda fits well with ICIMOD's strategy and approach.

The priority placed on gender, indigenous people, and migrants in the SDGs resonates with the needs ICIMOD and its partners have identified in the HKH. Based on this alignment, ICIMOD has created a set 'Priorities for Mountains and People of the HKH' to be consistent with and reflective of the SDGs, and how they may be applied to the HKH. We summarize these in the box below.

SDG consistent priorities for mountains and peoples of the HKH	ICIMOD Strategic Results	Most Relevant SDGs
End poverty in all its form everywhere in the mountains and ensure that women, men and children of the HKH lead healthy lives in an inclusive and equitable environment	1, 3, 4, 5	1, 3, 4
Promote sustainable production systems to assure food security, nutrition security, and income for mountain people, with particular attention to women's changing roles in agriculture	1, 3, 4, 5	2, 12
Achieve gender and social equity through inclusive and transformative change in the mountains	3, 4, 5	5, 10, 16
Ensure a year-round secure water supply in the mountains with universal and affordable access to safe drinking water, sanitation, and water for productive purposes	1, 2, 3, 5, 6	6, 13
Universal access to clean energy in the mountains from sources that are affordable, reliable, and sustainable	1, 2, 5, 6	7
Halt biodiversity loss, land degradation and sustainably manage forests and ecosystems in the mountains to enhance ecosystem resilience for sustained flow of services	1, 2, 5, 6, 7	15
Ensure sustainable adaptation to climate change and disaster risk reduction for the mountains through evidence-based decision making	1, 2, 3, 4, 5, 7	1, 11, 13
Build resilient, equitable and inclusive mountain communities empowered by economic opportunity and investment in mountain infrastructure	1, 3, 4	8, 9, 11
Promote a mountain-specific agenda for achieving the SDGs through increased regional cooperation among and between mountain regions and nations	6, 7	17

In support of achieving the SDGs, ICIMOD has an opportunity to provide robust and repeatable evidence on a number of social and environmental matters critical to mountain communities and mountain ecosystems. This work would direct, hopefully, specific attention within RMC national reports on mountain communities, particularly toward the disaggregated data linked to geographic locations. We are also directing the publication of an HKH Monitoring and Assessment Programme (HIMAP). Repeating this assessment every 4 or 5 years would be an important achievement.

ICIMOD's support to UNFCCC mitigation strategies: NDCs and REDD+

In the HKH, Nationally Determined Contributions (NDC) and Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD+) are the major approaches followed by the RMCs for meeting the UNFCCC objective of stabilizing greenhouse gas (GHG) concentrations in the atmosphere. All HKH countries have submitted their NDC commitments towards mitigation and adaptation. The submissions indicate land use and forestry as a major area for productive intervention. The NDCs also outline how HKH countries are integrating mitigation and adaptation into their national priorities such as sustainable development, poverty reduction, and private sector engagement. These are new policy areas for the RMCs and thus there is a need to ensure such emerging climate mitigation strategies are based on sound science, and communicated effectively across a range of stakeholders. ICIMOD will support its member countries in further developing and implementing their NDCs, with an emphasis on mountain perspectives.

REDD+ is a global policy and performance-based payment instrument under the aegis of the UNFCCC that recognizes the role of reducing deforestation and forest degradation in contributing to combating climate change. In the HKH, all RMCs have endorsed REDD+ and are in different stages of preparing policies and strategies for implementing this instrument. In REDD+, countries must prove successful outcomes through measurable reductions in the level of GHGs in the atmosphere in order to be eligible for financial compensation. REDD+ directly assists local communities and local governments in addressing the drivers of deforestation and forest degradation by designing suitable intervention packages to enable performance-based payments.

REDD+ is an innovative and strategic instrument for HKH countries to finance sustainable management of forested mountain landscapes. ICIMOD is committed to working with its member countries to customize this instrument at different levels across different landscapes.

ICIMOD's support to National Adaptation Plans (NAP)

The Paris Agreement urges keeping the global temperature rise below two degrees Celsius from pre-industrial levels by the end of this century, while simultaneously strengthening the ability of countries to deal with the impacts of climate change. Several HKH countries have ratified the Paris Agreement and are developing adaptation policies and actions in line with the convention and agreement, including National Adaptation Plans (NAP).

The NAP process enables countries to identify medium- and long-term adaptation needs to develop and implement strategies and programmes for addressing those needs. The objectives of the NAPs are to reduce vulnerability to the impacts of climate change, by building adaptive capacity and resilience; and facilitating the integration of climate change adaptation into relevant new and existing policies, programmes and activities.

Several HKH countries (Bangladesh, Bhutan, and Nepal) have begun developing NAPs. The NAP formulation process and outcomes will help HKH countries to address climate risk through designing appropriate adaptation strategies and mainstreaming climate change adaptation in development policies and plans. NAP is also useful to further scale up and promote successful adaptation options and strategies targeting vulnerable sectors and communities. The NAP process, and the engagement it facilitates, provide an example of how ICIMOD can strengthen the means to achieve the SDGs.

ICIMOD will support its member countries in developing NAPs, and encourage that the mountain perspectives are included. ICIMOD will support building capacities at the regional level and enhance support for NAPs by bringing together representatives of institutions involved with these processes.

The Paris Agreement recognizes the importance of averting, minimizing, and addressing loss and damage associated with the adverse effects of climate change, including extreme weather events and slow onset events (e.g., air pollution), and the role of sustainable development in reducing the risk of loss and damage. In MTAP-IV, loss and damage will be an important instrument for financing climate change adaptation and disaster risk reduction strategies.

The Paris Agreement states that developed country parties shall provide financial resources to assist developing countries parties with respect to both mitigation and adaptation in continuation of their existing obligations under the Convention. Such mobilization of climate finance should represent a progression beyond previous efforts. The convention also states that the provision of scaled-up financial resources should aim to achieve a balance between adaptation and mitigation, taking into account country-driven strategies, and the priorities and needs of developing country parties, especially those that are particularly vulnerable to the adverse effects of climate change and have significant capacity constraints.

2.7 Global Organization Landscape for Sustainable Mountain Development and Potential Investment

Global organization landscape

The UN General Assembly proclaimed 2002 the International Year of the Mountains, noting that mountains are an important source of water, energy, recreation, biological diversity, and key resources, such as minerals, forest products, and agricultural products. Mountain environments represent major ecosystems, which are essential to the survival of the global ecosystem; but they are rapidly changing. The Rio+20 Declaration -- “The Future We Want” -- recognizes that the vital goods and services mountains provide are essential for sustainable development across the globe. It also acknowledges the importance of mountains as home to indigenous people and local communities. The Future We Want warns about the vulnerability of fragile mountain ecosystems to the adverse impacts of climate change, deforestation and forest degradation, land use change, land degradation and natural disasters, and the marginalization of its communities. Therefore, this declaration invites countries to reinforce cooperative action with effective involvement, to share the experiences of all relevant stakeholders, and to adopt long-term vision and holistic approaches for creating mountain-specific programmes to address, inter alia, poverty reduction plans and programmes for mountain areas, particularly in developing countries.

Further, major global events in 2015 provided the world a new pathway with the Sustainable Development Agenda 2030, a global deal to tackle climate change and mainstream disaster risk reduction into development. The 2030 Agenda focuses on the impact that sustainable management of natural resources can have on social and economic development and the importance of conserving and sustainably using natural resources – terrestrial and water-based. Furthermore, the need to “[p]rotect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss,” in particular, explicitly cites mountains among the ecosystems to be conserved, restored and sustainably used in line with international agreements.

These global processes have special significance to the HKH, given that the region is one of the most impoverished and vulnerable regions in the world, disproportionately susceptible to climate change and other socio-ecological changes. Translating global agendas into concrete actions require consolidated efforts and effective collaboration at multiple levels. Such efforts offer opportunities to forge new partnerships for devising integrated and innovative solutions, capacity building and technology transfer, engaging with the private sector, tapping new financial instruments, and enhancing policy coherence.

ICIMOD is actively engaged with a network of international partners and key global processes to advance mountain voices and agendas from the region to global stages. The Mountain Partnership an important organization brings together diverse network of partners for promoting a sustainable mountain development agenda globally. ICIMOD represents the region on the Steering Committee of the Mountain Partnership to provide guidance and direction. Similarly, ICIMOD sees the outcome of Rio+20 “the future we want” as an important milestones to promote the mountain agenda. ICIMOD also participates in the UNFCCC programmes as an Observer. ICIMOD has been participating in the CoP meetings regularly and closely interacting with the various work-streams under UNFCCC. ICIMOD has been recognized as the Regional Collaborating Agency for the Nairobi Work Programme (NWP) and actively contributes to NWP submissions. In addition, ICIMOD has close ties with the LDC Expert Group to support LDCs in the HKH in preparing their NAPs.

The Intergovernmental Panel on Climate Change (IPCC), the World Meteorological Organization (WMO), and United Nations Environment Programme (UNEP) are important global organisations which bring governments together for critical environmental considerations that are closely linked with the

sustainable mountain development agenda. ICIMOD is an observer in the IPCC and interacts with IPCC processes to bring mountain issues to climate science and assessment reporting.

In recent years, the Climate and Clean Air Coalition (CCAC) has been established as the first global effort to address short-lived climate pollutants (SLCP). ICIMOD joined the CCAC as an IGO partner in 2012, and has taken an active role in the CCAC Working Group, and as a lead partner in the CCAC's Health and Regional Assessment initiatives. ICIMOD is also the implementing partner for the CCAC Brick Initiative activities in Asia.

In order to promote, develop and conserve biodiversity and ecosystem services, ICIMOD also closely works with Convention on Biological Diversity (CBD) where it sits as observer, and contributes to the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES). ICIMOD has been participating regularly in IPBES events and contributes its various deliverables through expertise and knowledge drawn from the HKH. ICIMOD is also a members of International Union for the Conservation of Nature and regularly participates in the IUCN congress and various commissions.

ICIMOD has been designated as a Regional Support Office (RSO) for UN-SPIDER, a platform that facilitates the use of space-based technologies for disaster management. UNEP and ICIMOD have been collaborating on various programmatic fronts for the past two decades. During the 106th Session of the International Organization for Migration (IOM) Council in Geneva, ICIMOD was admitted as an observer to the Council.

ICIMOD regularly participates and contributes to many international fora such as the World Water Congress, World Water Week, World Water Forum, World Park Congress, Global Landscape Forum, the World Conference on Disaster Risk Reduction, and Group on Earth Observations (GEO). ICIMOD has developed partnerships with many global organisations, including WMO, IGES, UNIDO, FAO, World Bank, IFC, and IFAD

Potential investment for mountains

Mountains occupy 22% of the world's land surface area and provide home to 915 million people. Half of all humankind directly depends on mountain resources, particularly for water and biodiversity. In the mountains, generally speaking, both poverty and ethnic diversity tend to be higher than other regions of the world. Mountain ecosystems are exceptionally fragile, subject to both natural and anthropogenic impacts. Mountain cultures and communities have been recognized as particularly vulnerable to the negative effects of climate change and other factors such as rising migration, land use and cover change, and globalization.

These factors present opportunities to view mountain development as a primary driver of change that can build resilience upstream and downstream and provide environmental and cultural services for a more sustainable world. Mountains have not received sufficient attention in global agendas and too little investment for multi-faceted development.

Mountain countries in Europe could be a valuable strategic partnership for ICIMOD and its RMCs. We will work to attract more attention from these countries for investment and long-term interest. Investment in mountains should not be affected by short-term issues like refugees and migration at the cost of longer-term interests for preserving and providing global goods and services from the mountains.

In recent years, China and India (both HKH countries) have begun investing in mountains, and this example needs to be enhanced and replicated throughout the region.

There is a current global trend of pooling resources to achieve development in larger contexts. For example, we see that a substantial amount of resources have been gathered in funding mechanisms such as Global Environmental Facility (GEF), Adaptation Fund (AF) and Green Climate Fund (GCF). These are excellent sources with a country-by-country mechanism for distributing support. These funds provide opportunity to smaller and marginal countries. Such funding should also open windows for regional funding mechanisms, as many global issues, such as climate change and glacier melt, are regional. ICIMOD was granted observer organization in 2015 to the Green Climate Fund. ICIMOD is working closely with RMCs and their nationally-designated authorities to become an accredited organization in the GCF.

There are currently various windows of funding available within the Convention and Paris Agreements, including the Least Developed Countries (LDC) fund, the Adaptation Fund (AF), the Special Climate Change Fund (SCCF) and the Green Climate Fund (GCF). In the HKH, finance remains the biggest question mark for adaptation strategies, and engaging with these processes can help gather momentum for funding adaptation measures in the region. ICIMOD will support the RMCs to absorb, manage, and disburse both domestic and international climate financing to enhance the resilience of mountain communities.

3. ICIMOD Approaches

3.1 Regional Cooperation

The Hindu Kush Himalaya (HKH) faces several critical regional issues related to climate change, degradation of natural resources, and flood-related transboundary humanitarian impacts and globalization, which provide opportunity for eight countries of the HKH to cooperate to address these regional challenges. This cooperation would be more meaningful and possible only when supported by scientific evidences and future scenarios where technical regional institution like ICIMOD has role to play.

Among the HKH countries, the need for cooperation at the regional level is increasingly important for economic and environmental reasons. While “economic development” is a common goal, there also is a shared concern that sole focus on economic interests could lead to competing extraction of natural resources, potentially resulting in deterioration of livelihoods as well as ecosystems across the region. To deal with potential threat, ICIMOD is uniquely positioned to foster cooperation in the HKH by building common understanding, creating platforms for exchanging information, and developing harmonized frameworks to achieve multiple and shared goals. Lessons from MTAP-III tell us there is significant potential to address issues of natural resource governance, securitizing ecosystem services and livelihoods, regional flood information sharing, glacier melting impacts, and resilience building. The transboundary “Common Branding of Products”, the South-South Dialogue platform in REDD, and the Inter-Country Cooperation Dialogues for Indus River are just a few examples from ICIMOD that demonstrate how building blocks can be assembled for long-term regional cooperation.

Through its transboundary landscape and river basin programmes, ICIMOD has been developing regional perspectives and frameworks for cooperation. Work has been already undertaken on culturally and ecologically important landscapes, water availability and water induced hazards (disasters), watersheds and multiple institutions related with these issues. Now we need to take this forward for explore the feasibility of regional cooperation by involving existing mechanisms, transboundary authorities and other interest groups to promote the HKH as a sustainable eco-region. Although each and every issue may not require a regional-level dialogue, cooperation can certainly move beyond bilateral to multilateral levels.

In this regard, our work in MTAP-IV will promote trans-community collaborations on eco-tourism, developing and promoting common value chains, cattle herding systems, watershed level planning for connectivity and water use, curtailing wildlife poaching, trade and forest fires. ICIMOD will also try to facilitate development of vertical and horizontal linkages and collaborations among intergovernmental, national and local institutions to foster transboundary partnership and cooperation, going beyond bilateral treaties and economic interests, to promoting social and environmental wellbeing at the regional scale.

Various processes, tools and mechanisms related to knowledge creation and sharing at the regional level provide important insights into how this can be strengthened. ICIMOD can also proactively provide platform for sharing of experiences by HKH countries that have had varied and rich experiences in relation to environmental management. Given the ecological complexity and political sensitivities of the regional environmental governance, it is important to envision multiple ways of regional knowledge sharing, networks and policy engagement platforms. Lessons learnt from some such existing practices where there are open and semi-open border controls, such as those between Nepal and India, Nepal and China, Bhutan and India, and Bangladesh and India can be extended to other areas of the region.

A shared framework and understanding on natural resources governance at the regional scale, supported by appropriate institutions can be useful in achieving the broader goal of regional cooperation. Therefore, while economic and inclusive growth is promoted and institutions delivering governance are strengthened for addressing broader SDG targets, regional cooperation needs fresh articulation for HKH based on transboundary learning so far, and for taking it beyond.

Key activities proposed during MTAP-IV are:

- Regional science and policy dialogue to address the major challenges faced by the HKH;
- Continue to provide credible information on resource availability, its usage, and its distribution over space and temporal dynamics with scientifically collected data and providing access of data and information;
- Provide a realistic scenario related with transboundary issues, which might be useful to highlight the potential challenges to transboundary cooperation in water-related issues and landscapes;
- Identify potential areas of cooperation as well as develop common platforms for knowledge sharing among scientists and decision makers to work on issues around cryosphere and glacier melting, flood and other natural hazards, river basin management approaches, cross-border forest and wildlife management, and sharing of groundwater with transboundary aquifers, river navigation, and developing cultural heritage tourism;
- Integrate best practices in conservation and development, and harmonize them for topical and customized cooperation, structural reform processes and procedures
- Build on existing cross-border governance mechanisms for regional cooperation, e.g. for trade and investments, sustainable resource management, disaster risk reduction, and develop “packages of cooperation” constituting of products and services of regional interest.
- Promote regional networks, knowledge forums and dialogues on critical environmental issues that warrant regional attention and cooperation.

3.2 Policy Engagement

Bridging the gap between the evidence, policy and practice is one of the key commitments of ICIMOD to achieve the goals of MTAP-IV. During the MTAP-III we have seen some very encouraging work on policy engagement ranging from facilitation to get new policies in place to assist in mainstreaming mountain specific policies. But despite these gains, the challenges in policy-related work at the programme, regional, and international levels continue to exist. From evidence and pilots to successful up-scaling and out-scaling by mainstreaming in local/national policies and planning; lack of mountain specific policies in large countries which have both mountainous and non-mountainous regions; inadequate recognition of transboundary solutions in the mainstream policy landscape in HKH countries; and getting the mountain perspective across in international and UN forums and processes will need continuous policy engagement during next five years. ICIMOD has developed a policy position paper that will be the basis for policy engagement in the MTAP-IV.

ICIMOD’s engagement with policy process will be based on the understating that it is non-linear, dynamic, complex, and often long drawn out. The process operates in a given political context, which needs to be understood. The policy system here is understood as “stated priorities, regulatory measures and laws, planning process and investment decisions concerning a given issue”. A good engagement with policy processes can relate to any or all of these elements in broader policy system. However, it needs to be underscored that ICIMOD’s role as intergovernmental organisation is not in making or changing policies, which is the role of RMCs. Policy engagement for ICIMOD is more in terms of proactively engaging and communicating evidence based on science and rigorous analysis, to influence policy processes, in conformity with ICIMOD vision, mission and programme outcomes (Figure 3.1).

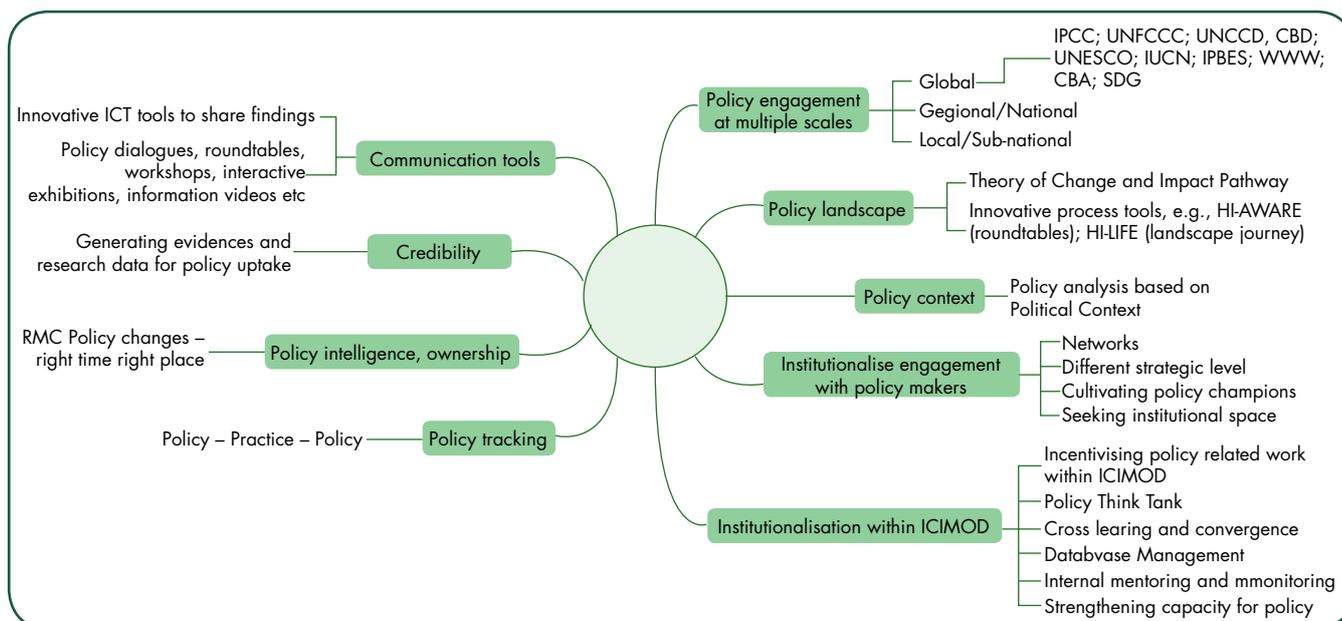


Figure 3.1: Tools for improving Policy Engagement

Policy engagement at multiple scales: Policy Influencing during MTAP-IV will need to be seen at multiple scales:

- at local, sub-national and national level in regional member countries (RMCs);
- at regional level by defining few strategic policy priorities for the region, in order for policy makers and partners to better perceive ICIMOD as a credible, authentic and transparent counterpart. With engagement of member countries, HKH Science –Policy dialogue would be promoted as regional forum to bring science–policy and practice connect; and
- to enhance buy-in for mountain specific agenda in global policy arenas.

In addition to the priorities at local, sub national and national level, the Sustainable Development Goals 2015 are providing unique opportunity of engagement at various levels within the RMCs, based on SDG-consistent regional priorities of ICIMOD.

Political context: Policy making is a political process. Technical rationality from scientific angle need to match with political rationality for an effective policy outcome. Understanding the political rationality therefore assumes significance. Some initiatives seem to have worked well (with respect to policy uptake) because there was a specific need from policy makers.

Policy landscape: Constructing a “Programme Theory of Change” for the policy outcomes by stakeholders led process, including policy gap analysis at the beginning of any initiative or programme would help in gaining agreement on the processes and strategies for producing desired changes.

Institutionalise engagement with policy makers: ICIMOD’s strength of being an Inter-governmental regional knowledge centre needs to be harnessed to the hilt for policy engagement and influencing decision-making. The unique strength of its Board, ICIMOD Support Group (ISG), PAC, and country focal persons, contacts of ICIMOD staff, strategic and implementation partners, and networks would be harnessed for better penetration at the policy level in each of the RMCs.

In past policy engagement process has often suffered due to shifting of key persons in the Government. While some of these uncertainties will always be there, there is a need to strengthen institutionalisation of the engagement. There are many ways this can be done such as

- by involving officials at different levels in strategic Ministry/Departments, targeting not only the top brass in the organisation, but some of the key staff (a rank or two below) who often have longer tenure;

- building Policy Champions as highly-networked and articulated individuals who can use their acceptance and credibility in policy circles to spread ideas generated from policy research among influential decision-makers;
- seeking institutional space on key bodies/ task force /committees;
- networking with key institutions in RMCs that have been on the forefront of policy work of critical importance. Partnership with the academia and key national institutions/organisation to help in building a long term engagement for policy advocacy; and
- “policy nudging” as a way to engage/commit policy makers need to be seen as part of overall strategy. Significance of the issue at hand, as well as cost of avoidance of the issue, both can be useful instrument in policy nudging.

Institutionalisation within ICIMOD

- Role of Country focal persons and other staff who have good experience of working with policy makers will be further strengthened/incentivised for creating space for policy engagement at national and sub-national levels. Revisiting the performance appraisal system to include institutional objectives where work related to policy engagement can be seen at par with outcomes like research findings in peer reviewed papers;
- Fostering link with key persons /institutions engaged with policy relevant work in RMCs and elsewhere. Such person/institutions need not be from our traditional partner spectrum but instead may come from a variety of professional backgrounds to bring fresh ideas and approaches;
- Policy support or engagement would be internalized broadly, not limiting to any specific programme or initiatives;
- Institutionalisation of knowledge exchange and database management across regional programmes in order to build body of work behind needs strengthening;
- Incorporating policy engagement/uptake, specifically, during the programme /initiative reviews would bring a greater focus and provide opportunity of strengthening the initiatives.; and
- Given significance of the policy engagement for ICIMOD, it would be useful to design a capacity building programme for ICIMOD staff that could be offered to programme partners at a later stage.

Policy intelligence: ‘Being at the right place at the right time’ – is what the policy intelligence does by being aware and open to find out what kind of support the Governments of the RMCs need and what policy changes are being planned. Systematic efforts would be made to pick up RMC needs for such support.

Credibility through scientific evidences: Most of the policy uptake work of ICIMOD has happened based on credible evidences generated through research data and backed up by field pilots. Therefore, generating credible evidence to influence policy making process would form the key step to policy engagement work.

Communication tools for policy engagement: Packaging key messages from the scientific evidence to befit the target stakeholders are key to effective communication. Use of Information and Communication Technology (ICT) tools makes it easy to share the findings from pilots/field demonstration in stakeholder specific manner. Communication tools like policy dialogues, roundtables, workshops, innovative exhibitions and consultative meetings would be effectively used to further policy engagement. Knowledge products like policy briefs, status papers/white papers, and analytic reports based on evidence and pilot demonstrations can greatly contribute to the effectiveness of policy engagement tools. Also, engaging journalists through orientation programmes/fellowships has been able to get print and electronic media carrying stories that have potential to provide trigger for policy influencing, as well as creating larger public awareness.

Influencing global discourse: Evidence based research and peer reviewed papers have the potential to influence global knowledge platforms like IPCC, IPBES, UNFCCC, CBD, UNCCD, and SDGs to strengthen mountain perspective. This however requires engagement with RMCs, much before the actual event. The run up to the Conference of Parties would be used as opportunities to engage RMCs to factor in key learning from the research and pilots.

Long term follow up/policy tracking: Policy processes are iterative and the feedback loop is the key for continuous improvement of policy processes. It would aim to assist RMCs in policy tracking /review of initiative /programme relevant policies to assess effectiveness and ways to further strengthen it (Policy-Practice-Policy).

3.3 Transdisciplinarity, Research into Use and Upscaling Approaches

Transdisciplinarity

ICIMOD's research and development interventions are issue-driven and solution-oriented. Some key elements of transdisciplinarity should be built into the intervention processes such as problem framing, problem analysis, solution identification, and solution validation. For example, it is common practice for ICIMOD's regional programmes to have stakeholders' participation in varying forms – ranging from consultation to active collaboration – at different stages of an intervention so that there is co-creation of knowledge as well as the ultimate ownership of knowledge-based solutions by intended users. Another example is the validation of science-based solutions through pilots, resulting in feedback communication from society to science, which is illustrative of the science-practice mutuality for knowledge generation. Finally, there is reflexive practice linked to the theories of change underlying the interventions, and participatory identification of impact pathways based on acknowledgement of complexity and plurality in the HKH context.

The sustainability challenges arising from the complexity and dynamism of the HKH context requires strengthening and more effective structuring of the transdisciplinary approach in ICIMOD's intervention processes. A set of 'design principles' for structuring transdisciplinary research of ICIMOD focuses on having collaborative teams with clear role definitions, joint problem formulation, creating common understanding of the problem, developing integrative research methods, achieving research-into-use and upscaling, and conducting impact evaluation. During this MTAP period ICIMOD programmes shall strengthen its transdisciplinary approach.

Research into Use and Upscaling Approaches

Research into Use (RiU) is defined as the process "of making research available, accessible, useful and useable"¹ that enables policy makers and practitioners to put research outputs into use (also referred to as 'research uptake'). A robust engagement between the researchers and the users early in the initiative is fundamental to developing a shared understanding of what research questions need to be addressed and hence, establishing a common objective. This initial engagement is critical to understand what knowledge gaps (and understanding) are posing a challenge for decision making. Once this is clear, key research questions can be framed jointly, thereby laying the foundation for assured research into use.

Research uptake into policy and practice is not a linear process; rather, it is dynamic and complex. ICIMOD's reputation and credibility of its research are key strengths that will help in the process of trust-building and deepening of relationships with large institutional stakeholders. At the regional level, multi-stakeholder forums, knowledge networks, and communities of practice would need to be strengthened for promotion of research uptake mechanisms.

Core elements

Impact Pathways: Theory of change and Impact Pathways methodology takes into account the context in which a desired change in policy or practice is envisaged. For research to be useful, the process of knowledge generation and its outputs would need to be contextualized in particular reference to potential users. ICIMOD's initiatives would need to proactively engage with contextual factors especially various levels of users to increase the chances of uptake of research findings.

¹ <http://www.impactandlearning.org/2012/12/trying-to-get-research-into-use-start.html> (accessed on 19 December 2016)

Stakeholder selection and engagement: A well designed stakeholder engagement process helps create opportunities for researchers to enhance the relevance of their research and tailors research outcomes. It also helps in knowledge co-creation that leads to further strengthening of trust and relationships between researchers and users. A research team may initially identify a large number of stakeholders, but for RiU to be effective there would be need for strategic prioritization of stakeholders based on the desired outcomes.

Tailored messaging and communication to key stakeholders: Communication is important to stakeholder engagement. Tailored messaging to key stakeholders would need an understanding of motivations, external influences, and relevance to existing institutional arrangements.

Local level strategic partners: Besides promoting credibility of the intervention at local level and playing a vital role in stakeholders' engagement, strategic partners can function as 'empowered hubs' for post-project sustainability. The criteria for choice of strategic partners would ideally include credibility, competence, collaborative spirit and network strength.

Monitoring and evaluation (M&E): A transparent, well-defined M&E framework is essential to achieving contextual relevance and high quality in research, which is key to establishing credibility of the institution in the eyes of users and thereby contributes to relationship-building.

Implementation of the RiU strategy at ICIMOD's initiative level should be "iterative and adaptive, moving forward in a conscious and reflective way that can respond to emerging opportunities"².

Conceptualizing upscaling

Upscaling is a process of expanding the use of a desirable practice, technology, or process either through upward changes in the policy environment that drive dissemination of the process or method ('scaling up'), or outward spread across sectors, jurisdictions or landscapes ('scaling out')³. Thus, while horizontal scaling out refers to expanded use across a wider area, sector or jurisdiction, a vertical scaling up often involves transferring local level results to national or international practices levels, mainstreaming them into policies, procedures or institutions.

Action research and innovative pilots are platforms for introducing innovations, enhancing capacities of field implementation agencies and directly engaging with mountain communities. Action research and innovative pilots also constitute key elements in ICIMOD's strategy for attaining the institutional goal of enhancing resilience and facilitating the wellbeing of mountain communities. The degree of scaling up of results from the action research and pilots by stakeholders at different scales will provide tangible measures of success of such interventions, and by extension, of ICIMOD's objectives.

ICIMOD's demonstrations of practices, technologies and approaches through action research and pilots can be adopted – or adapted – by farmers or villagers in the immediate vicinity, leading to a certain degree of replication. As users in neighbouring villages replicate these practices and approaches, the process of scaling out can be said to have begun. Local agencies (technical departments) may also adopt some of the technologies and practices in their regular schemes with clear budgetary outlays. Such measures 'mainstream' the interventions and help in the process of scaling out. However, when a local agency or other actors (including NGOs) formally adopt the demonstrated technologies and approaches in their projects and programmes for replication over a larger area or landscape with their own resources, a scaling out in the true sense would have been set in motion. An intervention or approach, however, would be deemed to have been scaled up only when such approaches are adopted and incorporated

² From HI-AWARE Staged Evaluation – First Thematic Review Report, 2016

³ Rossing, T., J. Ayers, S. Anderson, and S. Pradhan, *Participatory Monitoring, Evaluation, Reflection and Learning (PMERL) for Community-based Adaptation: A Manual for Local Practitioners*. CARE International, 2012. http://www.careclimatechange.org/files/adaptation/CARE_PMERL_Manual_2012.pdf

into the designs of larger programmes (or schemes) funded and executed by provincial or sub-regional or national agencies (or funding agencies) as a policy component.

- ICIMOD’s Initiatives and Programmes that have action research and pilots must develop in the initiation itself a strategy focusing on scalability, which would also serve as an exit strategy and contribute towards the post-project sustainability of interventions. Principles that need to be incorporated while developing this strategy are:

Engagement with the key stakeholders at relevant scales to identify the problems/challenges that need to be addressed through the action research or pilots (developing a common or shared objectives), with the prime objective of establishing a strong alignment of the action research/pilot to the RMC’s relevance;

- Fully engaging the key stakeholder(s) as equal partners in the supervision of the action research/pilot implementation;
- Regular joint monitoring for mid-term course corrections and capturing lessons (hence, establishing a mechanism for co-production of lessons and knowledge); and
- Supporting the partner in policy engagement with key actors. The table below⁴ lists the necessary attributes for scalability.

Credibility	Results and impacts of the model are well documented and provable. The model has been evaluated independently, and tested in a setting similar to the one for upscaling. The model is acceptable to relevant stakeholders outside the immediate implementation process.
Observability	Results and impacts are visible and comprehensible to the project stakeholders, and attributable to the model. Results and impacts can be easily communicated to an interested public
Relevance	Relevant stakeholders, partners and the project’s target group consider upscaling necessary and desirable. The model reacts to an observable and expressed need, and designed to include marginalised groups (gender, youth, ethnic) in as many aspects as possible. The model creates significant improvements in systemic (social and/or ecological) resilience towards CC effects.
Relevant advantage	The model has a better cost-benefit ratio than comparable alternatives. Upscaling produces economic advantages, economies of scale for specific aspects of the model
Easy to transfer	Technologies or innovations promoted by the model are easy to adopt for the target group, and not likely to create conflict within the target group. Human and financial resource input needed for the introduction of the model is replicable across a wider area. The scaled up model can be applied through existing infrastructure and facilities, and can be implemented mainly through locally available resources and materials, also in a scaled up setting. Few potentially blocking or disabling decision-makers are involved in the implementation
Compatibility	The model addresses social, political and environmental aspects that can also be traced in the upscaling setting; The activity is in line with relevant legal frameworks and policy practice
Testability	The model can be tested in small steps by the target group without full adoption

The RiU – upscaling continuum and impact pathways: Although RiU and Upscaling seemingly stem from different contexts – that of research and pilot demonstrations – it will be necessary for ICIMOD to view these as parts of a continuum. The growing demand from RMCs to align ICIMOD activities to address key challenges in their respective countries requires an approach where stakeholder engagement helps

⁴ Adapted from A. Krumsiek, Climate change adaptation in the Lower Mekong Basin: An overview of activities and trends with a view to lessons learned for project planning and upscaling, Vientiane, MRC, 2013

in shaping research questions for ICIMOD's programmes. This will help ensure the uptake and the application of research results in shaping solutions, thus strongly increasing the probability of getting ICIMOD's research into use. Similarly, the joint identification of challenges, designing of innovative pilots drawing on research findings, partnering in implementation, capturing lessons and facilitating their into larger programmes and policy will increase the relevance and ownership of ICIMOD's interventions in the RMCs.

An effective way for operationalizing the RiU and Upscaling strategy for ICIMOD will be through the process of development of Theories of Change and Impact Pathways, with active participation by partners and stakeholders. These processes must be executed at the initiation of an Initiative/ Programme and followed up with periodic revisits. These will provide useful opportunities for capturing lessons, refinement of strategy, as well as in building a stronger ownership by partners for the interventions. Although RiU and Upscaling should be in continuum, it must be recognized that the Theory of Change and Impact Pathway for each would be unique and differentiated as the objectives for the two and the end result of both are not necessarily the same.

3.4 Theory of Change and Impact Pathways

Recognizing the fact that ICIMOD is a regional knowledge organization- means that impact will be achieved through utilization and up-scaling of the scientific and research knowledge generated working with and through different partners. Others will take the knowledge forward is critical to thinking about impact for ICIMOD. Bringing about the 'change' in the face of complexity which takes place within social-economic-environmental system in a highly non-linear way and linking the design, learning, and, monitoring and evaluation is imperative to comprehend, identify and understand the complex programmes. Therefore, a theory-based approach to impact can help to draw out the main pathways in order to make the theory of change explicit in terms of different actors and users of outputs and outcomes leading to development impacts.

ICIMOD will continue applying a participatory theory of change and impact pathways for its regional programmes and initiatives as planning, monitoring and evaluation approach. ICIMOD considers that a ToC is both a process and a product. Both are important for our programme design, strategy, implementation, and evaluation. To us a theory of change is rigorous participatory processes whereby programme stakeholders come together and identify the conditions they believe have to be unfold to achieve the long-term goals of our programmes. These conditions are modeled as network maps, outcome and impact logic. Part of the ToC process we try to understand the context of our programmes and initiative, the current state of problems, social, political and environmental conditions our programmes are seeking to influence and identify relevant actors and partners to influence the long term change that our programmes and initiatives seeks to support. Together with programme stakeholders, we make our assumptions explicit about how these changes might happen, as a check on whether the activities and outputs are appropriate for influencing change in the desired direction.

As a result of this process, the product we try to produce is a visual representation of the change our programmes and initiatives want to see with an orientation to how stakeholders expect it to come about; a blueprint for evaluation with measurable indicators of success; a common understanding among stakeholders about what defines success and what it takes to get there; a powerful communication tool that captures the complexity of the programme or initiative; and, a clear and testable hypothesis about how change will occur that not only make stakeholders accountable for results, but also makes programme or initiative results more credible because they were predicted to occur in a systematic way; and, a powerful learning tool providing stakeholders learn from the process and implementation of the programme or initiative.

For ICIMOD programmes, a ToC is developed in a participatory way involving the stakeholders of the programme or initiative. ToC can sharpen the planning and implementation of an initiative or program, with a ToC in hand the measurement and data collection elements of monitoring as well as evaluation processes are better facilitated, constructing a ToC or programme theory right at the beginning of any initiative or programme better helps gaining agreement on the processes, plans and strategies through which the programme or initiative potentially produce desired results. Developed in consultation with the stakeholders, a ToC improves the contribution aspects of a programme or initiative towards the impact produced by the programme or initiative thereby reduces the complexity associated with causal attribution of impact.

The approach of theory of change and impact pathways helps validation of the contribution of ICIMOD to its strategic results and impacts defined in its strategic framework. Utilisation of the approach provides improved evidence around the way it works directly and with partner's contribution to impact. The focus for creation of evidence is to facilitate accountability to stakeholders and to support learning and policy information and influence. At the same time it also provides support for funding choices when resources are limited.

3.5 Building Socioeconomic and Ecological Resilience

Sustainable and resilient mountain development is very much a part of ICIMOD's mission statement. Through its programmes and initiatives, ICIMOD has been trying to build resilience of mountain socio-ecological systems. Activities like setting up resilient mountain village, developing sustainable value chains, preparing participatory natural resource management plans, and optimizing ecosystem management, are a few examples of how ICIMOD is contributing to community level resilience building. Now a need is felt to directly focus our activities to building resilience especially of the marginalized mountain communities and their environment, in the wake of growing evidence about the likelihood of climate change impacts and the increasing number and intensity of disasters taking place in HKH.

The mountain context, with its 'specificities' like inaccessibility, fragility, and marginality makes resilience building pre-requisite to achieving sustainable development goals (SDGs). There are many ways in which the mountain 'specificities' can hinder/constrain efforts on SDGs achievement. 'Inaccessibility' imposes restrictions on development interventions and aggravates the impacts of disasters by challenging timely post-disaster relief, recovery and rehabilitation efforts; the 'fragility' of mountain environment makes the ecosystem and communities dependent on them extra vulnerable to disaster-related disturbances, often resulting in irreversible loss of ecosystem services and functioning; and 'marginality' implies inadequate development governance and poverty alleviation efforts.

If the resilience and wellbeing of mountain systems are not maintained and in some cases built up, then it is likely to create resilience related issues for downstream systems as well. For example, ICIMOD studies have established clear links between snow and glacier melt in the mountains and water availability in the plains. Similarly, land degradation and crop depredation leading to abandoning of mountain agriculture is resulting in out-migration. Therefore it is imperative for governments to realize this mountains-plains linkage and accordingly tailor their policies. For trans-boundary ecosystem services, this linkage poses even greater challenge for resilience building in the region.

It is useful to distinguish between "engineering" or restorative resilience (bounce back), and "ecological" or transformative resilience (bounce forward). For ICIMOD, gender-positive, socially-inclusive transformation and sustainability, as ultimate goal, can be achieved only if we understand transformative change in a continuum, ranging from Disaster Risk Reduction (as bouncing back, preventive pole) to resilience as a bouncing- forward process (see Figure 3.2).

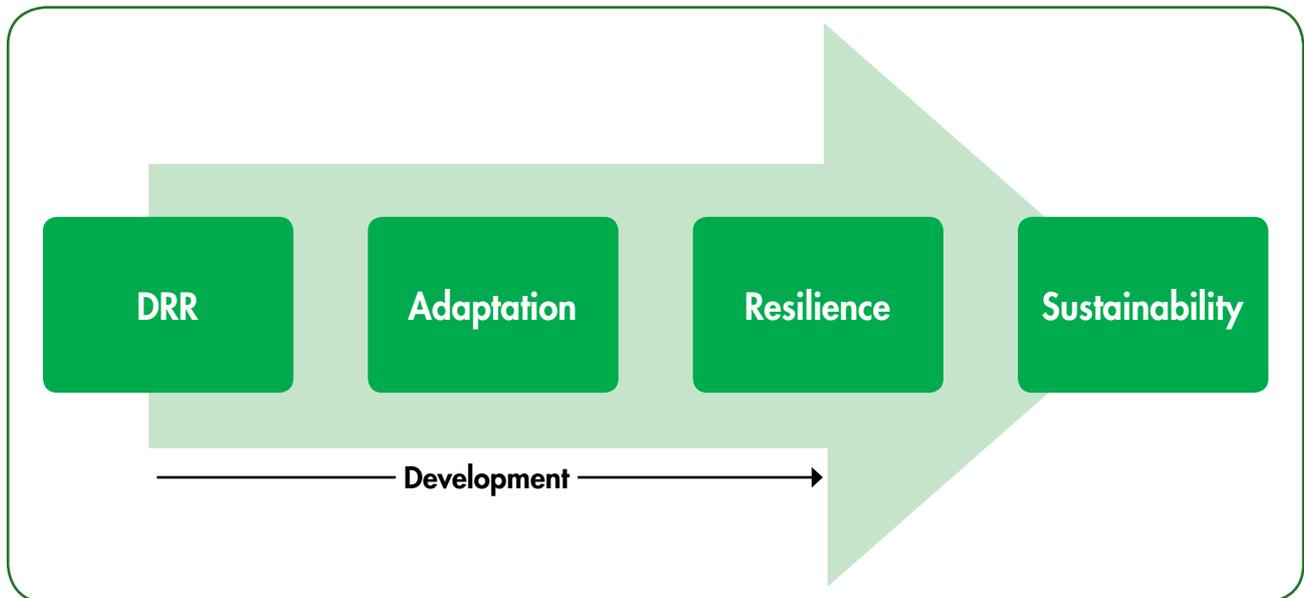


Figure 3.2: The continuum towards sustainability development

An approach to resilience building at community level

In this section we present an operational framework to guide the approach ICIMOD could take towards building resilient mountain socio-ecological systems during the next five years (see Figure 3.2). The framework takes into account the mountain context, drivers that impact the context, and the action area for ICIMOD. Drivers – both climatic and non-climatic – act on the local context that is characterized by the set of mountain ‘specificities’. The state of people-nature interaction is a key aspect of the mountain context and the degree to which ecosystem services and biodiversity are sustainably used and managed has a bearing on the capacity of the system to achieve resilience outcomes. Ecosystem resilience is an important factor contributing to coping as well as to adaptation, and also minimizes disaster risk.

Resilience outcomes may be evaluated across its three dimensions of recovery, improved adaptive capacity, and transformative change. For ex ante resilience building at the community level, ICIMOD’s interventions would need to act on multiple combinations of factors drawn from the context. The contextual factors can be arranged under four categories – ecosystems (natural resource stocks, ecosystem services, biodiversity), institutions (local governance arrangements for benefit-sharing, social inclusion and gender empowerment), value-creating infrastructure (physical connectivity, access to finance, market links, local skills and entrepreneurship), and cross-scale linkages (upstream-downstream and links across governance scales). These factors are identified from literature; some are indigenous to the community (e.g. local skills & entrepreneurship) and others are externally determined (e.g. access to technology and information, physical connectivity). Not only is there interplay among these factors at the local scale, as the framework Figure 3.3 illustrates, resilient outcomes can potentially modify the influence of cross-scale drivers on the community. The inherent dynamism of the context thus requires that appropriate learning loops accompany the design of interventions in the form of solution packages from ICIMOD side.

Way forward for ICIMOD in MTAP-IV

The way forward for ICIMOD in MTAP-IV may be spelt out in terms of ‘Four Questions and Four Actions’. Given our knowledge gaps in understanding what factor combinations would contribute to building resilience in different social-ecological contexts, research on the topic is an immediate priority. Drawing from our framework above, the guiding scientific questions in this regard may be framed as follows:

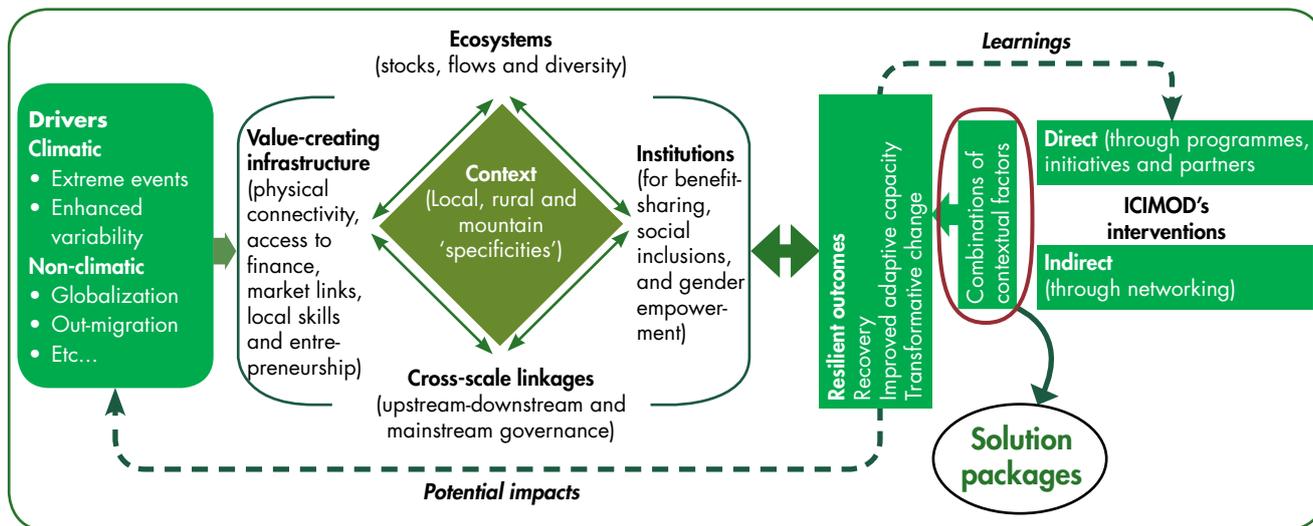


Figure 3.3: Resilience Framework

- What methods would be appropriate for identifying and assessing the dynamic relationship and interaction between socioeconomic and ecological systems, and incorporating this in the design of ICIMOD's interventions to build resilience?
- What metrics do we use to measure, monitor and evaluate 'resilience' of complex socio-ecological systems (SES), and to assess and track our influence on determinants related to social processes, social capital, informal institutions, and role of social actors (including leadership) in the SES context?
- How best can we operationalize the integration of DRR, adaptation and resilience in ICIMOD's interventions?
- What may be the elements of a regional approach to building resilience in the case of landscapes conservation and trans-boundary ecosystem services supply? How can we achieve policy uptake of ICIMOD's 'solutions packages' in HKH countries?

The four action areas for ICIMOD are suggested to be the following:

Identifying a range of context-specific 'solutions packages': ICIMOD's efforts to develop climate resilient mountain villages are an example of 'solutions package'. Now we need to go further by developing more comprehensive solutions packages to fit diverse contexts in the mountains. ICIMOD's existing interventions related to spring-shed restoration, inclusive value chains, participatory natural resource management planning, and digital services can become part of solutions packages for integrated resilience building efforts.

Building institutional capacity and cross-scale linkages: Central to the efforts for building resilience is a need to capacitate and empower local institutions while simultaneously strengthening their capacities and abilities to build strong partnerships with institutions and governance agencies at the next higher level.

Taking the lead through pilots and field demonstrations of 'solution packages': Interventions addressing cross-sector linkages and key thematic nexuses are going to be a key demand from stakeholders in the SDGs-era. It would be a strategic advantage for ICIMOD to take the lead through pilots and field demonstrations of resilience solution packages in the region.

Establishing a community of practice for integrated DRR-adaptation-resilience building in HKH: Since 'building resilience' would need to be discussed along with vulnerability reduction, DRR and adaptation, an ICIMOD-led resilience network in the HKH can strive for a shared understanding and vision among the relevant actors and stakeholders belonging to these domains. As a regional organization, ICIMOD can try to establish a network of national and international agencies that are already working on resilience-enabling factors as per their respective mandates (i.e. a community of practice).

3.6 Data Sharing and Intellectual Property Rights: Principles and Practices

ICIMOD houses an institutional, open access, online repository of research data and knowledge products. Its data management and sharing policy and practice is based on the principle of open and free access and has both internal and external aspects. Internally, ICIMOD has put in place mechanisms for implementing data management and sharing within its programmes. The internal work-flow process, when research is designed and planned, and how data will be managed and shared during the research process by ICIMOD's regional programmes and initiatives, as well as how it will be shared externally is guided by the Operational Guidelines for ICIMOD Regional Databases.

Externally ICIMOD's Data Policy is designed to facilitate data sharing in the region and among the global community. ICIMOD is committed to continuing its financial and human resource investment in managing and sharing data and its derivative knowledge products—interactive maps, models, publications, decision applications, and value-added products and services designed to make data more useful to a diverse constituency of end-users—and will encourage its member countries and partners to do likewise. ICIMOD is also committed to continue building partnerships with other international organizations involved in promoting good data management and sharing practices.

Internal

Internally the Operational Guidelines for ICIMOD Regional Databases pertain to and cover:

- **Data Management Plan** developed by each Programme/Initiative with technical inputs from the Regional Database Initiative (RDI) if required, shared with RDI, describing proposed datasets; data quality assurance procedures; management and archiving of collected data; data use restrictions if any; copyright and intellectual property rights of the data; and data management roles and responsibilities within the project team.
- **Data Generation** and management by each Initiative according to agreed industry standards for improved consistency, quality, integration, aggregation, sharing, documentation, comprehension, updating and security using standard database design practices including conceptual data models, logical data models, defining data entities, attributes, relationship and cardinality and domain value rules.
- **Data Formats** that are open standard and interchangeable, ensuring long-term usability, for organising, structuring, naming, unique versioning and authenticating the identity of master files.
- **Data Quality** procedures, methods and protocols, such as instrument calibration, standardized interview formats, validation rules, date entry input masks, controlled vocabulary, code lists, and choice lists to be incorporated into project data management plans.
- **Data Documentation** using international standards, such as ISO 19115 for spatial data, the Data Documentation Initiative metadata standard, and the Dublin Core Metadata Specification for creating metadata, developing templates for different thematic metadata and customizing tools for implementing metadata in the regional database management system.
- **Data Management** through state-of-the-art geo-ICT infrastructure for storage and management of centre-wide database, use of Enterprise Database Server and Geo-database frameworks for non-spatial and spatial data, IT audit-compliant back-up for reliable data storage, and uninterrupted data services through Database Replica Server.
- **Data Access** and Sharing within the programmes only, within the centre only or among the larger public, determined, as the case may be, by the Data Policy, its ownership and custody guided by ICIMOD's Intellectual and Property Rights Policy as well as partnership agreements, and the sharing facilitated through tools, such as metadata search engine, web map services and FTP services through ICIMOD's Regional Database System and Mountain Geoportal.

External

Externally the data sharing policy is based on the principle of free open access as laid out in ICIMOD's Data Policy. These pertain to and cover

- **Partnerships in managing and sharing data** - ICIMOD is committed to working to maximizing accessibility and use of data and its derivative knowledge products and services through continuing investment in the necessary areas and the aggregation and development of skills and expertise through collaboration with regional country members and partners on the basis of trust, proper assessment of needs and the principle of mutual benefit
- **Managing and sharing data with member countries and partners** - In collecting, acquiring, managing, and sharing data, ICIMOD respects and abides by the relevant international and national laws, third party intellectual property rights, confidentiality obligations, and the contractual terms and conditions of use imposed by providers of data, but negotiating whenever possible with data providers for the widest possible access to use.
- **Citation, attribution and acknowledgement of data** - ICIMOD provides appropriate attribution and acknowledgment of the source and the contribution of partners at all times, following citation standards, where available, to ensure ethical use of data. Likewise, ICIMOD expects users to cite and acknowledge ICIMOD when using its research data
- **Dissemination of data and adherence to international standards** - ICIMOD strives to ensure that only high quality data are shared and disseminated and to this end will also document any weaknesses in the data to alert users to potential limitations. ICIMOD adheres to internationally accepted best practices for data preparation and documentation, which include adherence to global metadata standards, such as the standards of the International Organization for Standardization (ISO) for spatial data, the Data Documentation Initiative metadata standard, and the Dublin Core Metadata Specification. When sharing data, ICIMOD will safeguard the confidentiality of information about individual respondents. When documenting and sharing traditional knowledge, ICIMOD will adhere to existing laws and international best practices and ethics. ICIMOD will work with its partners to share knowledge developed as a result of using traditional knowledge with the providers of traditional knowledge such as communities.

Data sharing and intellectual property rights policy

Intellectual property rights (IPR) protect the interests of creators by giving them property rights over their creations. IPR relates to items of information or knowledge which can be incorporated into tangible objects at the same time in an unlimited number of copies at different locations anywhere in the world.

Open data sharing necessarily involves issues of intellectual property rights. ICIMOD's Intellectual Property Rights Policy is consistent with and complements other ICIMOD policies and strategies including its Knowledge Management and Communication Strategy, Data Policy, Publication Policy, Partnership Policy, and Human Resources Policy.

Rationale for managing intellectual property rights

ICIMOD recognizes the substantial benefits to science, the economy, and society that are or could be derived from global movements toward universal and open access to research output and knowledge products. Given its emphasis on universal and open access to research output and knowledge products ICIMOD seeks to align its Intellectual Property Rights (IPR) to initiatives that promote open and free access to science, information and knowledge.

ICIMOD and intellectual property rights

ICIMOD will ensure that it is in full and complete compliance with Member States' and International IPR laws and regulations as they relate to its operations and programmes. ICIMOD will operate under the following policy principles in regard to IPR:

- ICIMOD is fully committed to Open Access publishing and Open Source deliverables and to making these deliverables fully accessible as an international public good at no cost.
- ICIMOD shall not seek IPR protection on its own final research outputs and knowledge products, unless such protection is clearly beneficial in terms of ensuring public access to such research results or knowledge products. In the case of copyrights ICIMOD shall seek such protection as appropriate and indicate that free use is permitted subject to appropriate citation.
- ICIMOD adheres to the principle of unrestricted public access to its own final research output and knowledge products and will make such output freely available.
- Works of literature, art, photographs, software, database, maps, etc. that are a direct result of data produced at ICIMOD or through its work or data produced by its staff either separately or in collaboration with others on assignment shall be the copyright of ICIMOD exclusively or jointly in the case of partnership.
- Research output or knowledge products prepared on ICIMOD's behalf, that derive from Initiatives or activities implemented by or through ICIMOD, or are prepared by authors or partners commissioned by ICIMOD, are considered to be ICIMOD's. ICIMOD retains the copyright on material so produced and published and will follow the Creative Commons BY-NC (Non-Commercial) license and will clearly indicate this in all its research output or knowledge products. This license entails that the user is free to copy, distribute and transmit the work for non-commercial purposes and requires that the user attributes the work in the manner specified by ICIMOD.
- Where ICIMOD has collected, used, or published traditional knowledge, it will abide by international best practices in citing and acknowledging the traditional knowledge providers.
- ICIMOD will expect users to cite and acknowledge ICIMOD when using its research output and knowledge products.
- ICIMOD agreements will specify that ICIMOD reserves the right to share research output and knowledge products with all member countries and partners in the event of national or regional humanitarian and emergency crises adhering to international practices.
- ICIMOD may seek IPR on its own inventions and materials, including those obtained through research/partner collaboration, where such IPR is necessary to ensure free access to these materials or technologies. In the area of copyrights ICIMOD shall seek such protection as appropriate and in a manner that allows free usage of such materials with appropriate citation.
- ICIMOD shall distribute all appropriate research materials and knowledge products together with a material transfer agreement (MTA) to ensure that recipients cannot seek IPR on these materials.

Partners and intellectual property rights

In agreements between ICIMOD and its collaborative partners, IPR provisions will adhere to the following objectives:

- protect the collaborator's own confidential information as required by the collaborator's own policies;
- ensure that access to the output of such collaborations is made available on a fair and equitable basis with minimum restrictions;
- allow for commercialization where it benefits the resource poor;
- require the collaborator to incur any costs associated with obtaining, maintaining, and commercializing any resulting IPR;
- ensure that all parties to the collaboration obtain a non-exclusive, irrevocable, world-wide, royalty-free right to use any resulting IPR;
- require the payment to ICIMOD of royalties based on the net profit of money earned on any resulting IPR;
- as from the date of acceptance of any deliverables, ICIMOD shall be free to use the report or manuscript and each and any related part thereof, including thereby, without any limitation, the right to use, edit, print, and/or publish all or part of the manuscript in any form in any language;
- if ICIMOD decides not to publish or use produced materials, the collaborator may publish or use these materials in adherence with Open Access and Open Source principles; and

- the Collaborator shall take full responsibility for ensuring that the work produced by themselves, or anyone employed by them, respects intellectual property rights and does not use works protected by copyright law without permission prior to submitting the final report to ICIMOD.

3.7 Natural Resource Governance and Institution Building for Mountain Development

In development literature, governance is a key theme and is seen as being core to ensure the success of interventions to improve the quality of societal and environmental wellbeing by avoiding the “natural resource curse⁵.”

Keeping with the definition given by World Development Report, 2017, ICIMOD also believes that governance is the process through which state and non-state actors interact to design and implement policies within a given set of formal and informal rules.

ICIMOD encounters a wide range of governance issues at multiple levels while dealing with natural resource management and related income enhancement activities. Till now governance issues have been addressed in various ways in different regional programmes and projects. As was stated in MTAP-III, activities related with community level ecosystem management planning, institution building such as setting up on water management committees, and bringing in coordination between groups engaged with value chain were undertaken. Similarly at national level, gaps in the country level policies for adaptation to climate change, policies dealing with climate pollutants were identified by undertaking policy studies in Nepal, India and Bhutan. At regional level, a study exploring rationale for river basin level cooperation potentially leading to a win-win situation was undertaken. In MTAP-IV we propose to build on the existing work, extend the lessons learnt to other areas, and undertake relevant research to improve institutional understanding of governance related issues.

While environmental issues are being taken up at global level, national environmental policies and institutions in the region too are constantly evolving to adjust to the changing demand internationally as well as domestically. Key areas where policies are being reoriented are climate change, disaster risks, pollution, and management of biodiversity. Increasingly these are being brought in public policy forums, and decentralization and devolution are being accepted norms. There also are growing interests in market mechanism as an active partner shaping resource distribution.

Sustainable Development Goals (SDGs) relevant to governance issues seem to emphasize on sustainable management of resources through access and justice to all through promotion of inclusive institutions at all levels, including regional level. This would be the focus of ICIMOD’s governance related work during MTAP-IV period. It will be a combination of policy engagement, institution building at appropriate levels, bringing gender sensitivity in governance systems, and documenting as well as establishing good practices.

Engagement in policy implementation

ICIMOD will continue to remain engaged with policy making at national and sub-national level by providing evidence-based inputs to make the policies more people centric. However, it will now also help in the implementation of environment related policies like decentralization in management of natural resources such as forest and water. It is increasingly found that although policies and laws for management of natural resources in the HKH are fairly comprehensive, there are barriers and challenges in implementation. ICIMOD professionals will engage with the implementing agencies by sharing good practices, supporting sub-national, national level staff in building capacities for integration across sectors, for developing mechanisms for decentralized financial plans and budgets, for preparing documents like action plans required for meeting several international obligations, and for providing technical inputs to that implement policies.

⁵ The resource curse, also known as the paradox of plenty, refers to a situation where countries with abundance of natural resources, specifically non-renewable resources, tend to have less economic growth.

Support in institution building

It is now well recognized that one reason for failure in implementation is inadequate or inappropriate institutions. Our earlier work has shown that institution building especially at local level helps communities in service delivery. ICIMOD can continue to provide professional help in designing and setting up of institutions ensuring that the principles of good governance like participation, transparency, accountability, inclusiveness and flexibility are followed. We will also explore the possibilities of promoting and supporting transboundary landscape and river basin level institutional arrangements for regional cooperation.⁶

Nesting of formal and informal institutions

Most of the HKH continues to have informal/traditional institutions managing natural resources at local level. Communities are able to relate with them more than any other governing institution imposed by the government, be it centralized or decentralized. While the formal institutions have statutory backing, informal institutions have the advantage of knowledge of local conditions. Avoiding over crowding of institutions or institutions working in silo, nesting of formal and informal institutions with a functional arrangement will be of mutual benefit. ICIMOD professionals will explore these possibilities on case-by-case basis, and pilot it at selected places.

Making governance gender sensitive

Urbanization, predominantly male migration, occupational diversification and similar changes are also changing gender dynamics in mountain areas. Several studies have shown that these trends have resulted in more physical work for women left behind in rural homesteads as well as increased responsibilities. But not necessarily supported by more authority to access resources and decision-making. Even in decentralized village level institutions women representation is either tokenism or completely absent. The strong team of gender and governance professionals at ICIMOD will work with partners in selected areas to encourage active participation of women in institutional functioning at local level by building awareness as well as capacities of women through trainings.

One of the guiding principles that WDR 2017 proposes is to not only think about what form institutions should have, but also about the functions that institutions must perform. MTAP-IV will concentrate on developing activities that focus on functions of existing institutions in the HKH.

3.8 Science Quality and Use of Knowledge

Science quality

ICIMOD's policy and practice solutions are and need to be based on strong scientific evidence. Appropriate audiences and constituencies predicate evidence-based policy and societal impact on generating high quality knowledge and the use of that knowledge at the appropriate time and in the appropriate manner. To ensure quality science and the use of the knowledge generated by ICIMOD and its partners, ICIMOD produces knowledge at the intersection of its thematic areas and regional programmes. This promotes the adoption of transdisciplinary and holistic approaches to addressing complex issues, and is at the core of ICIMOD's approach to science quality. By navigating the interfaces between natural sciences and social sciences, science and policy, policy and practice, and mountains (upstream) and plains (downstream), ICIMOD's approach to science quality aims to strengthen science-policy-practice interfaces, and to ensure that our research is put to use.

⁶ More on this in the section on Regional Cooperation.

ICIMOD's role is to generate and package science-supported results that have real impact for the lives of mountain people. ICIMOD intends to strike a balance among basic science, applied research, knowledge sharing, implementation, and policy relevant advice covering social, technical, institutional and environmental issues. With its unique knowledge sharing experience, ICIMOD provides a crucial link among science partners who generate primary knowledge, implementation partners who bring practical aspects of this research to mountain communities, and policy makers. To be an effective link, ICIMOD must produce quality science to contribute to regional development on a par with the most up-to-date international knowledge.

ICIMOD has boosted its science output by doubling the number of articles published in peer review journals in the past five years. The current level of around 80 journal articles per year will be maintained, and increased to 100 per year. In order to fill data gaps in the HKH, ICIMOD is continuing its focused science work on glaciers, biodiversity, water resources, air quality and mountain livelihoods. ICIMOD at the same time uses geospatial analysis, modelling, and regional database development to systematically analyze, store, and make available regional information on important critical indicators of mountain environment.

To ensure science quality, ICIMOD has engaged key staff and prioritized science outputs to enhance the quantity and quality of science produced. Chief Scientists, Theme Leaders and Regional Programme Managers play an important role in guaranteeing the quality of ICIMOD's science, building on the scientific expertise of ICIMOD's professionals. To further increase the quality of its science, ICIMOD will:

- Increase its interface with international research centres, providing an entry point for their work in mountain areas and helping to link their research to policy and implementation. This collaboration will help ICIMOD work with basic and applied science in areas outside the Centre's competencies.
- Continue to carry out basic and applied research in its regional programmes, enhance knowledge exchange and sharing, standardize methodologies, promote gender disaggregation of data, and effectively package and disseminate the results.
- Update its strategic staffing plan and develop the scientific staffing profile accordingly.
- Intensify collaborations with HKH university professors and students as part of the Himalayan University Consortium.
- Invite visiting scientists from the region and beyond.
- Strengthen the role of women researchers.
- Include institutional and individual monitoring of the quality and amount of science output, as well as its use, in the Centre's performance appraisal system.

Use of knowledge

The use of knowledge is crucial to raise awareness, guide policy, influence opinion, inform behaviour, steer intervention, encourage adaptation and result in cumulatively favourable impacts on mountain environments. There is a deep understanding and culture within ICIMOD that success will be measured by the extent to which communities, government agencies, practitioners, and scientists use the data and information generated and shared by ICIMOD and its partners, and not only by producing and publishing high-quality science. We are also aware that decision makers quite often do not have time to read scientific papers before making their decisions. Therefore, in order to address the issue, ICIMOD uses the following four approaches for use of knowledge:

- **User friendly (re)packaging of research based knowledge:** While science quality is at the core of ICIMOD's research work, ensuring that the knowledge generated through research will be used by a wider audience and relevant decision makers is always a part of any research and knowledge product. ICIMOD invests considerably in repackaging high-quality science in to simple, easy to use and accessible 'knowledge products' which are sometimes even co-produced with potential decision makers to ensure a wider interest and ownership. This ensures that ICIMOD's knowledge is included

in the relevant discourse and has a larger chance of being used in policy and practice. The process will continue with further engagement of decision makers in co-producing solution oriented knowledge products based on ICIMOD's high-quality science. A recent example is the Himalayan Climate and Water Atlas, which portrayed the impact of climate change on water resources in five of Asia's major river basins, based on significant scientific research conducted by ICIMOD and partners. To make this research accessible to policy makers, practitioners and implementers, the Atlas repackaged scientific information in an easy to understand and follow format.

- **Engagement with media:** Mainstream journalists and social media will continue to be involved in raising awareness, creating public opinion and political support in favour of ICIMOD's agenda. To further strengthen the process, ICIMOD will work with reputed media professionals and provide capacity development and media grants to young journalists for quality coverage of climate and environment issues in the mainstream media.
- **Policy Champions process:** ICIMOD has also recently started working with 'policy champions' by engaging with senior/retired government officers of repute in RMCs to receive their inputs as well as to better understand the functioning of the policy process and government systems. The process not only promotes a two-way learning process which continuously helps ICIMOD in understanding and serving the needs of the RMCs better, but also has a first mover advantage in case of any policy engagement opportunity arising in the countries. This process will be further refined and developed appropriately during MTAP-IV.
- **Knowledge platforms:** Our final approach for the use of knowledge is to contribute to as well as create sharing and learning platforms for knowledge exchange through stakeholder dialogues, roundtables, workshops and events at global, regional, national and local levels providing opportunities to our staff, partners as well as others to share and use the advanced scientific knowledge and solution oriented approaches.

3.9 Well-being

ICIMOD strives to realize its vision of "men, women and children of the Hindu Kush Himalaya enjoy[ing] improved well-being in a healthy mountain environment." The concept of "well-being" is a central objective in the United Nations' 2005 Millennium Ecosystem Assessment (MEA). However, the MEA provides little to define or circumscribe the idea of "well-being." Through our work at ICIMOD, we have come a long way toward establishing a stronger understanding of well-being for mountain people in the HKH, particularly in terms of the concept multi-dimensionality.

3.10 Youth Engagement

Rationale

Youth are agents for change. In the HKH, this is no exception: Young people comprise more than a third of the population and will play crucial roles as innovators and change makers for inclusive sustainable development. Youth in the mountains face particular challenges of access to knowledge and information, lack of opportunities for dignified gainful employment in the context of out-migration of mostly men, young women shoulder the double burden of sustaining family reproduction in an increasingly resource-challenged livelihood. School-aged children in both cities and rural areas seem under-appreciate their cultural values and ecological heritage. Youth, nonetheless, holds a great potential in natural resource management, disaster preparedness, building climate change resilience, working toward climate smart innovative solutions and creative economic opportunities, and safeguard of cultural heritage, peace and security. While research on mountain youth-specific issues and youth-led solutions and best practices in the region remain scarce, some but not all governments of the RMCs have fully recognized the importance of investment in youth in their youth-specific strategy and policies.

ICIMOD recognizes the importance of youth for creating inclusive sustainable development in the HKH, and we are preparing to embrace this potential by engaging school-aged girls and boys through our programmes and initiatives. We will work to involve youth from upstream and downstream communities, and from groups regardless of social strata or cultural background. We understand that the future success of mountain development for ICIMOD and its partners rests upon our ability to develop the skills and capacities of young people through mountain-specific education, leadership training, and entrepreneurship development.

Building Skill – Entrepreneurship landscape

Entrepreneurship has been recognized as a major conduit for sustainable products and processes. Promotion of social and environmental entrepreneurship is proven crucial for sustainable development and poverty reduction. Skilling and Entrepreneurship in mountains therefore need to be taken up on priority basis in order to address issue of migration and unemployment. It has been observed that skilled people go out, but they come back soon as the remuneration and the new work environment does not suit them. Promotion of entrepreneurship, rather than only skills therefore is clearly called for, more so in areas where we have advantage being in mountains. Various programmes and initiatives would have a key role here.

Unique mountain goods and services: Hindu Kush Himalayas have richness of medicinal and aromatic plants, nutritional crops, a range of timber & non-timber forest products, bamboo and canes, agro biodiverse production base, livestock and a very rich bio-cultural landscape around which enterprise values chains and industry partnership can be built. Aroma therapy, well ness tourism, heritage tourism, variation of responsible tourism and value chain development in niche mountain products lend immense possibilities to populate the skill landscape by engaging mountain youths.

Partnership and Collaboration: Non-traditional skills practiced by mountain people to be seen as important area to further develop for employability of mountain people. It will call for stronger Public – Private- Community Partnership. Engagement with Ministry and Departments of Skill and Entrepreneurship would help in garnering larger support. Natural product based skills and entrepreneurship has distinct advantage in Mountains.

Skill and Entrepreneurship Networks

ICIMOD has good advantage for such networks. On pilot scale, some of the initiatives in MTAP3 have contributed to skills and entrepreneurship building in niche mountain products, through value chain development, and shown further possibility of scaling up. Godavari Knowledge Park has shown ways in strengthening skill set of youths, helping some of them to become entrepreneurs. All of the above examples from ICIMOD's various initiatives and programmes share a common feature of a triple bottom line impact, i.e. aligning economic benefits (income) with social and environmental benefits. Apart from the start-up nature of the enterprises, these ventures are also characterized by a complexity of relationships, hybrid financing arrangements, and a potential for upscaling.

Network of technology and skill/entrepreneurship center, built around mountain specific goods and services, with strengthened public –private partnership would thus have a huge role to play in addressing issues of mountain youth. ICIMOD would continue promoting social and environmental entrepreneurship for sustainable mountain development. It will provide a platform for networking and partnerships, bringing together a diverse group of enterprises, researchers, investors, policymakers and members of civil society.

4. Thematic Core Competence

4.1 Livelihoods

Background

Improving rural livelihoods and alleviating poverty in mountain communities pose the most critical development challenge in the HKH. The region's rural people live in remote and environmentally harsh areas with poor social and physical infrastructures and unfavourable market conditions. Traditional subsistence smallholder farming and migratory pastoral livelihoods in these mountain regions face increasing challenges from the impacts of climate change, human-animal conflicts, increased natural disasters, and the degradation of forests and rangelands. In addition, poor infrastructure, limited access to water and energy, poor market linkages, and limited know-how on development of marketable products and post-harvest management threaten the sustainability of mountain agriculture and traditional rural livelihoods. Together, these factors contribute to a gradual decline in the productive labour force, the feminization of labour in the farming sector, keeping agricultural land fallow, and eroding traditional knowledge.

Managing such transformations requires innovative approaches and strategies for sustainable livelihoods. Given their relatively small and scattered populations, mountain communities often go unheard in political and policy discourse. Despite significant progress technological advancement and communications in lowland areas, economic growth in the South Asian region has not translated into inclusive livelihood opportunities for the rural poor in the HKH. Poverty, vulnerability, and inequality are widespread, and access to resources and services and gainful employment opportunities are limited. An essential question is how poverty, gender, vulnerability, social inequality, and livelihood insecurity in the mountains can be better understood and addressed.

Advances in the subject in last five years

Climate change and other socioeconomic changes – including globalization, liberalization, and urbanization – bring new challenges as well as new opportunities in the HKH, as many communities are now connected to national, regional, and global markets. At macro level, the regional economy is growing and the economic structure changing: the primary sector of the economy is in decline while the manufacturing and service sectors have been growing. At micro level, farm-based jobs have remained almost stagnant, while non-farm jobs are growing below their potential. Agriculture is in transition: farmers are moving from subsistence to cash crops, while agribusiness and contract farming are developing rapidly. Rural youth especially men are migrating to urban areas and abroad leaving women and the elderly behind. The inequality between lowland and upland communities, rural and urban areas, rich and poor, and women and men, is increasing.

In 2015, two global agreements that could have profound implications for the HKH were signed: the Sustainable Development Goals (SDGs) and the Paris Climate Agreement. The 17 SDGs collectively aspire to a future of sustainable development wherein poverty is eliminated and no one is left behind. The SDGs are critically important for HKH and its numerous sub-group populations of disadvantaged groups and ethnic minorities who experience multiple deprivations.

Thematic focus for MTAP-IV

ICIMOD has developed capacity in mountain livelihood research along a range of topics, such as

- Market linkages;
- Gender analysis;
- Entrepreneurship development;
- Value chain development;
- Renewable energy options;
- Adaptation and livelihoods promotion and diversification;
- Promotion of mountain niche products and services;
- Decentralised renewable energy options;
- Mountain agriculture food and nutrition security; and
- Promotion of non-farm activities such as tourism, migration and remittances.

The Livelihoods Theme also possesses skills for

- Analysing social, economic, policy and governance issues;
- Exploring alternative policy and institutional options for addressing poverty and vulnerability, and
- food and nutrition related challenges; and
- Promoting equitable access to resources and informed decision-making.

Based on past experience, the Livelihood Theme intends to build in-house skills for contributing to resilient livelihoods and prosperous mountain communities in the HKH through sound analysis, knowledge, and understanding. We will bring mountain issues and perspectives into development planning and policy making for transformative change.

In the MTAP-IV, we will focus on the following actions:

- Developing skills for generating data and developing knowledge about evolving livelihoods, the drivers of change (demographic, socioeconomic, climatic, environmental), their impacts on mountain poverty and social and gender structures, and emerging challenges and opportunities for livelihood enhancement;
- Strengthening skills for mountain livelihood opportunities, identifying innovative options, strategies and practices, and promoting mountain niche products and services for facilitating effective adaptation and building resilience, particularly for marginalised people and communities;
- Developing staff and partner capacity to identify and support non-farm employment opportunities to facilitate transitions from farm to non-farm sectors for rural women and youth to reduce vulnerabilities, enhance prosperity, and realize the aspiration of rural youth by focusing on market-led approaches, including branding of mountain products and certification;
- Building capacity for supporting demand-driven skills to enhance employability and promote occupational mobility of the rural poor—both women and men—to reap benefits accruing from the urban-centric growth processes;
- Building staff capacity engaging with private sector to harness business opportunities for entrepreneurial youth to generate market-driven employment opportunities;
- Supporting skills for equitable and inclusive financial services to the poor, including harnessing remittances for local development;
- Building staff capacity on facilitating clean energy access to rural poor for sustainable livelihoods promotion focusing on decentralised renewable energy options; and
- Supporting staff skills for transitioning to resource efficient and low carbon development paths by unlocking opportunity for green and inclusive growth through cutting edge research and holistic action for innovative solutions.

Methodologies and approaches

The Livelihoods Theme will adopt a gender responsive people-centered, multi-disciplinary approach to understand the diverse forces and multiple factors that shape the livelihoods of mountain communities. We will build our competencies based on existing knowledge and experiences. We will focus on

a systematic analysis and synthesis of existing knowledge, and make this information available to ICIMOD's Regional Programmes and RMCs for informed decision-making and sustainable development. Regional Programme implementation will be strengthened through action research, piloting, testing, and assessment of livelihood programmes and projects, including identification of best practices for livelihood enhancement and poverty reduction. Partnerships with national, regional, and global partners will be strengthened to undertake collaborative research. Available fora and electronic media will be used to develop partnerships with mountain research and development communities and to promote the application of knowledge generated.

In MTAP-III, the Livelihoods Theme prepared a number of frameworks, methodologies, and position papers on emerging livelihood issues. Different stakeholders including governments, UN agencies, and development partners have used some of these frameworks and approaches. In MTAP-IV, the livelihoods theme will aim to produce the following frameworks, approaches, and research:

- Livelihood outlook/approach paper for emerging livelihood options, challenges and solutions;
- Skill development approach paper elucidating what skills will be required for enhanced mobility of rural unskilled/semi-skilled workers;
- Contextualizing SDGs to mountain settings, supporting governments to make development plans that are SDG-inclusive;
- Non-farm sector development: What are the factors constraining non-farm sector development and what actions, policies and strategies and institutional support are required to support non-farm sector development, particularly mountain tourism, migration and remittances?;
- For entrepreneurship based on mountain products, models, approaches and strategies will be developed keeping in mind the mountain specificities and application of appropriate models to different Regional Programmes and Initiatives; and
- Framework for mainstreaming mountain specific policies in the RMCs national planning processes and promoting multi-stakeholder engagement and good governance.

Contributions to regional programmes

The Livelihoods Theme will make important contributions to the Regional Programmes by providing critical analytical and development expertise through a mountain livelihoods lens. Knowledge generated from research will also be used to strengthen the initiatives and activities of the Regional Programmes. The Livelihood Theme will play a vital link in the overall research-knowledge-policy continuum. During MTAP-IV, we will aspire to do the following:

Adaptation and Resilience Building

- To analyze the impacts of socioeconomic, governance, and climatic drivers of change on livelihoods of mountain communities in the HKH;
- To conduct action research, piloting, testing, and assessment of livelihoods and climate resilient programmes and projects, including identification of best practices of livelihood enhancement and poverty and vulnerability reduction, clean energy options, food and nutrition security;
- To develop strategies for leveraging emerging opportunities to enhance and diversify livelihoods of mountain people and innovative governance mechanisms through increased market linkages and private sector engagement; and
- To develop evidence-based livelihood and climate resiliency strategies that can be adapted and upscaled in the region for making livelihoods more prosperous.

Transboundary Landscapes

- To develop knowledge of resource use and sustainability patterns of different ecosystems, including economics of resource degradation in the region and identification of sustainable and emerging opportunities for ecosystem use to strengthen livelihoods at different scales;

- To develop appropriate incentive mechanisms and valuation approaches to benefit the livelihoods of mountain communities for their roles in the conservation of mountain ecosystems;
- To design strategies for strengthening innovative livelihoods and governance mechanisms in the transboundary landscape through promotion of private sector engagement and market linkages; and
- To facilitate collaborative transboundary and multi-disciplinary research on key issues challenging mountain livelihoods such as human-wildlife conflicts.

River Basins and Cryosphere

- To assess the impact of water management patterns on livelihoods of mountain communities in the HKH;
- To develop water governance mechanisms to enhance adaptive capacities and building resilience of mountain communities; and
- To develop strategies for building the preparedness of mountain communities to be more resilient to risks, hazards, and stress.

Atmosphere

- To assess the economic and social impacts of mitigation options;
- To assess the impact of black carbon on mountain people's health, livelihoods, and socioeconomic conditions;
- To develop good practices, lessons, and options for promoting environment friendly renewable energy in the HKH; and
- To document the policy, institutional, technical, market, and socio-cultural factors that influence adoption of environment friendly energy options for upscaling in the HKH.

Mountain Environment Regional Information System

- To gather input for improved application of geo-based technologies for better resource mapping, geo-referenced socioeconomic data sets, and documentation of livelihood and socioeconomic changes.

Mountain Knowledge and Action Networks

- To introduce mountain perspectives in academic and vocational education and training in order to nurture youth creativity in mountain areas for entrepreneurship promotion;
- To provide training to resource persons; and
- To develop collaborative research on key livelihood related topics for Master and PhD students.

4.2 Ecosystem Services

Background

The HKH houses one of the most diverse ecosystems on the earth, featuring a rich biodiversity of species and genetic levels, supplemented by ethnic and cultural diversity, and manifested in a myriad of habitats and vertical heterogeneities in soil, water, climate, and topography. As the source of ten river major basins and home to numerous glaciers, the HKH is often referred to as "The Third Pole."

These factors contribute to the high degree of genetic diversity in terms of crops and livestock species in the Himalaya, which require equally diverse management systems for negotiating the interface between human systems with natural systems. The flow of services (e.g., supporting, provisioning, regulating, and cultural) provided by these mountain ecosystems contributes to the wellbeing of the mountain populations throughout the HKH, the downstream areas, and the global community.

However, despite international recognition, mountains, in general, and the HKH, in particular, continue to face enormous pressures due to anthropogenic change on regional and global scales. These pressures

have disrupted the region's mountain ecosystems and threaten the HKH in various ways: rising poverty, biodiversity loss, ecological degradation, and diminished ecosystem service provisions.

Climate change has emerged as the most widely discussed driver of global change. As a driver, climate change is embedded in a matrix of other drivers such as globalization, population growth, and local land-use and land cover change. All of these, in combination, have significant ramifications for ecosystem resilience, which can lead to greater vulnerability of natural and human populations. Thus, action at the local, regional, and global levels is required to ensure that ecosystem health is maintained to sustain the flow of ecosystem services, so that people in the HKH have the tools they need for mitigation, adaptation, and enhanced resilience.

Advances in the ecosystem services over the last five years (MTAP-III)

During MTAP-III, Ecosystem Services has built on the global discourse of advancement in terms of developing a thematic understanding of mountain ecosystems including rangelands, forests, wetlands, and agro-ecosystems. To this end, we have focused on planning, programming, and human resource development for the purpose of investigating ecosystem service issues and developing protocols, methodologies, and capacities of partner organizations to address various needs. The resultant work has produced a variety of integrated frameworks through which to address ecosystem service issues with appropriate complexity:

- Long Term Environmental and Socio-Ecological Monitoring (LTSEM) framework;
- Integrated Ecosystem Management Framework (IEMF);
- Ecosystem Assessment Framework (EAF); and
- Cultural Services Assessment Framework (CSAF) for sacred sites.

In addition, the Ecosystem Services Theme has focused on several strategic actions to enhance its effectiveness and impacts:

- Developed strategic environmental plans and policy analysis;
- Provided policy advice to concerned stakeholders;
- Generated tools to promote planning management for ecosystem services;
- Promoted integration of globally standardized approaches such as:
 - Long-term Ecological Monitoring (ILTER) for forests;
 - Ecosystem-based Adaptation (EbA);
 - Participatory Natural Resource Management (PNRM) for enhancing ecosystem resilience and biodiversity conservation;
 - Incentives for ecosystem services (IES); and
 - Global Observational Research in Alpine Environments (GLORIA) protocol for alpine research

Ecosystem Services theme also enhanced biodiversity knowledge by establishing a data sharing platform in collaboration with the Global Biodiversity Information Facility (GBIF) and the Global Mountain Biodiversity Assessment (GMBA). The Theme promoted integrated and multidisciplinary approaches on research, focusing on the driving forces behind the changes in biodiversity and ecosystem services. In this way, we generated an integrated knowledge base and demonstrations for coping and adaptive mechanisms through customized local, regional, and global best practices to improve ecosystem resilience and management interventions.

Thematic focus for MTAP-IV

In last decade, advances in science and technology have presented new opportunities for sustainable development in the HKH through improved access, education, and communication. In pursuit of the Sustainable Development Goals (SDGs) and in adherence to emerging trends from international forums (e.g., CBD, IPCC, IPBS, UNFCCC), the Ecosystem Services Theme will streamline its activities to generate scientific knowledge on mountain ecosystems for sustainable management.

In this spirit, Ecosystem Services will pursue the following objectives during MTAP-IV:

1. To enhance the professional capacity of human resources for ICIMOD and partners on contemporary science;
2. To enhance multidisciplinary and interdisciplinary research and approaches for understanding the social, economic, cultural, and environmental nexus and proactively managing ecosystems at the watershed or landscape level; and
3. To strengthen our knowledge base for the region with state of the art science products, policy briefs, and open access databases.

Methodologies and approaches

During the MTAP-IV the Ecosystem Services theme will continue to engage partner institutions for promoting ecological research across ICIMOD's Regional Programmes for data enrichment, knowledge sharing and capacity building. Together with partners, the theme will experiment and demonstrate areas for ecosystem management interventions for improving the conservation and restoration of mountain ecosystems through mountain-specific approaches such as transboundary conservation, PES/IPES, REDD+ and EbA. Finally, the theme will advocate a regional voice at global conventions and actively engage in international forums such as CBD, Ramsar, UNFCCC-GLF, IPBES, IPCC, GBIF, ILTER and IUCN. Furthermore, Ecosystem Services will contribute to regional cooperation and policy influence on mountain biodiversity and ecosystem services.

We will develop methodologies and/or approaches in the following areas:

- A more comprehensive plan for establishing long-term monitoring systems that consider environmental, social, and ecological frameworks with a series of permanent plots covering representative mountain ecosystems. We will promote sustenance of such monitoring sites for continuous flow of data;
- A more integrated biodiversity database covering all identified transboundary landscapes and critical areas in the HKH;
- An integrated framework including relevant methods for the assessing ecosystem health including soils;
- Observing and monitoring biophysical and climatic variables for biomass assessment and vegetation dynamics mapping using earth observation data and field survey technologies;
- A methods framework methods for monitoring greenhouse gas (GHGs) emissions and carbon sequestration in a few critical ecosystems including soils; and
- Promote pilots (including transboundary) at the local level and landscape scale within regional frameworks on ecosystem management. We will document the data from these pilots, and present our findings in national and sub national fora for influencing policy.

Contributions to regional programmes

During MTAP-IV, Ecosystem Services will network with other thematic areas to provide intellectual support for the implementation efforts of our Regional Programmes. This work will include generating knowledge products in cooperation with ICIMOD's partners, and providing scientific evidence for policy-making and development planning. Several crosscutting areas, such as valuation of ecosystem services, access to genetic resources and benefit sharing, and gender and governance will be further built within each areas of action during next five years. The knowledge products generated during MTAP-IV will contribute to local, regional, and global understandings of the complex ecosystems of the HKH.

The major anticipated contributions Ecosystem Services during MTAP-IV are summarized below:

Adaptation and Resilience Building

- Analysis of impacts of climatic and non-climatic drivers of change on ecosystems and the flow of ecosystem services in the HKH;

- Action research, piloting, testing, and assessment of ecosystem management and ecosystem services while examining ecosystem-livelihoods interfaces and dependency of mountain communities.
- Assessment of cost benefit analysis of ecosystem-based vis-à-vis community-based adaptations, resiliency practices, and environmental benefits; and
- Examples of evidence-based successful ecosystem-based adaptation, ecosystem management, incentives for ecosystem services, and resilience strategies that can support policymaking for enabling ecosystem based adaptation policies and frameworks.

Transboundary landscapes

- Contributions to understanding the structure, functions, and dynamics of high altitude ecosystems under the effects of climate change and anthropogenic disturbance;
- Assessment of ecosystem services in transboundary landscapes and promotions of participatory action research on transboundary issues such as wildlife corridors, habitat fragmentation, soils, and invasive alien species;
- Standardization of management practices at the landscape level (e.g. eco-labelling of landscapes) and pilots for mountain specific conservation, practices, tools, models and paradigms; and
- Integration of frameworks established in all landscapes where ICIMOD works. Such frameworks include, Long Term Environmental and Socio-Ecological Monitoring (LTSEM) Framework, Integrated Ecosystem Management Framework (IEMF); Ecosystem Assessment Framework (EAF) and Cultural Services Assessment Framework (CSAF) for sacred sites.

River Basins and Cryosphere

- Assessment of freshwater ecosystems and watersheds, including identification of critical freshwater ecosystems with enhanced understanding of their interaction with terrestrial ecosystems, and innovative knowledge on ecosystem health in the HKH;
- Analysis of water quality and quantity with respect to on-going development and climate change in the HKH;
- Assessments of the impacts of climate change and anthropogenic activities on ecosystem services to regulate the water in the HKH and downstream;
- Evidence-based policy support for integrating freshwater and aquatic ecosystems in national and sub-national policies, such as Environment Impact Assessments (EIA), and Incentive for Ecosystem Services (e.g., for people who protect watersheds upstream of hydropower stations).

Atmosphere

- Assessments of the impact of atmospheric pollution on ecosystem health and biodiversity in the HKH;
- Understanding ecosystem functions contributing to the regulation and mitigation of atmosphere pollution;
- Monitoring and assessment of greenhouse gas (GHGs) emissions from a few critical ecosystems such as wetlands; and
- Studies of carbon sequestration considering both process and functioning of ecosystems such as forests, grasslands, and wetlands.

Mountain Environment Regional Information System

- Assessment and mapping of vegetation dynamics at landscape scale for monitoring the degradation or restoration of ecosystems; and
- Visualizations of the habitats of rare, endemic, and endangered species for assessing and restoring corridor connectivity.

Mountain Knowledge and Action Networks

- Enhanced awareness of ecosystem services and their impacts on humans and the environment among local, national, regional and global communities;

- Valuation of ecosystem services flowing from protected areas (and comparable studies across the HKH) will be completed under the SANDEE network; and
- Collaborative research on key ecosystem-related topics for graduate students and visiting scholars in the HUC network.

4.3 Water and Air

Background

- Adaptation to and mitigation of climate change are paramountly important in the Hindu Kush Himalaya (HKH) where mountain development poses unique challenges for the 210 million people living in the region.
- Water and air are two linked and critical resources at the heart of adaptation to and mitigation of climate change. Water can be a source for clean energy that can contribute to mitigating fossil fuel consumption. If mitigation is about improving air quality, then adaptation is about managing water resources sustainably. At ICIMOD, the Water and Air Theme (W&A) uses cutting edge science to deliver solutions on both these aspects.
- There are four major strands of expertise in W&A:
- Cryosphere experts observe, study, and monitor characteristics of glaciers, snow, and permafrost as markers of climate change;
- Hydrologists investigate the impact of climate and other changes on the cryosphere, water resources, and water-related disasters in river basins using hydrological models;
- Water governance and management experts examine local, regional, and national and scales of managing land and water resources sustainably, including springsheds, early flood warning systems, and hydropower benefit sharing; and
- Atmospheric scientists explore the sources and processes of air pollution, and their impact on environmental and human health, and means of mitigating pollution through work with public and private partners.

Advances in the subject in last five years

In the last five years, we have made rapid advances in our knowledge about the atmosphere, cryosphere, and water resources in the HKH.

The IPCC Fourth Assessment Report, released in 2007, announced that anthropogenic drivers were the main cause of climate change and its resultant negative effects on the environment and society. In MTAP-III, ICIMOD responded to the report by increasing its focus on climate change in the HKH. Since then, we have undertaken the following work:

- Initiated glacier mass balance monitoring networks in some RMC's. We aim to coordinate these projects with ongoing work in other RMC's and international sites;
- Commenced new work to measure seasonal snow cover through remote sensing-based monitoring combined with in-situ observations;
- Improved our understanding of high altitude weather using automatic weather stations; and
- Expanded our research on permafrost through mapping permafrost proxies.

These intervention are yielding long-term time series data, which is being used to make predictions about future cryospheric change at catchment levels. We also endeavored in the following areas:

- Investigated the effects short-lived climate pollutants (SLCP), such as black carbon, on glacier and snow melt;
- Studied cryosphere-related hazards such as glacial lake outburst floods (GLOF);
- Developed methodological frameworks for measuring permafrost, snow and ice, and glacier mass balance; and
- Built capacity of instructors and students enrolled in our Kathmandu University's glaciology programme.

With the introduction of climate projection data from IPCC's Fifth Assessment Report (2013), new data and information are available for making climate projections. Our water professionals have used this data for large-scale hydrological modelling that enables us to understand the impact of climate change on water resources. Hydrological models have also been applied in smaller catchments to support flood forecasting. Furthermore, we have developed a methodological framework for understanding upstream downstream linkages and for measuring the impact of upstream processes on downstream water availability, erosion and sediment dynamics in the transboundary Koshi basin.

We focus our work on addressing the needs of mountain communities – for livelihoods and resilience. We realized the need for enhancing our understanding of springshed because millions of people in the mid-hills of the HKH depend on these drying springs. We have tested an eight-step methodology to revive springs. We have also developed protocols for community-based flood early warning systems (CBFEWS) and successfully tested this system in several small catchments.

In the past five years, there has been increasing regional attention to the issue of air pollution and the lack of solid data available. We have worked with partner governments to set up several state-of-the-art air pollution monitoring stations in Nepal and Bhutan. We have used the data from these stations for numerical pollutant transport modeling to understand sources and pathways of pollution. We have launched several short-term field campaigns focusing on other air quality topics such as winter fog, indoor air pollution and emission source characterization.

W&A professionals have also led efforts in mitigation of air pollutants. In the wake of the Nepal 2015 earthquake, we fostered brick kiln rebuilds that employed designs that used less energy, polluted less, and produced better bricks.

At the heart of W&A thematic work lies two principles: 1) enhancing science quality in-house, and 2) delivering science in a wide array of partnerships to build our mutual capacities. We focus on producing science knowledge that can be published in high quality journals, but we understand our success can have greater impact through standardizing methodologies (based on our research) that can be replicated across the region by other stakeholders. In this way, through our regional programmes, we help to build the capacity of students, civil society, and government agencies.

Thematic focus for MTAP-IV

W&A's focus for MTAP-IV will remain largely the same with professional staff enriching our knowledge on the impact of climate change on glaciers, water, and atmosphere. We need to improve our process understanding of cryospheric changes – including precipitation at higher altitudes – to make more accurate predictions of snow and ice extent. For this work, networks of high altitude meteorological observations and glacier mass balance monitoring sites need to be maintained to ensure long-term time series data. Cryospheric monitoring sites should also be expanded into data sparse regions through our partners. With improved spatial and temporal measurements of BC concentration in snow, its potential influence on snow and ice melt can be better assessed through numerical modelling.

We recognize the continuing need for improved understanding of hydrology, ecosystems and livelihoods, permafrost distribution, and the processes and impact of thawing permafrost on hazards. We will continue our work of applying hydrological models to understand the present water availability, to predict changes in future hydrology based on climate projection data, and to quantify upstream downstream linkages in the lesser studied basins of the HKH. We will use similar tools at the catchment scale to deliver locally specific data and integrate various modelling domains (water, cryosphere, atmosphere, ecosystem and socioeconomic) to better understand the impact of climate change on water resources and people who depend on these resources.

We also realize the need for working more at the local level on water access and equity issues. Therefore, we will expand our work on reviving springs, improving access to water for domestic and agricultural purposes, and providing community-level flood early warning systems across most of ICIMOD's RMCs and river basins. In doing so, we will involve communities as co-equal partners and encourage citizen driven science. We will build up our strength in hydrogeology, which is lacking at the moment. We will also work on urban water issues which are increasingly under stress in much of HKH.

Our air thematic professionals will focus on using new data from observatories to provide scientific evidence for reducing the adverse impacts of air pollution, with a special focus on urban air pollution. While air pollution monitoring technologies are becoming more complex by the day, advances in computing, communication (such as smart phones), and visualization tools have enabled simplification of complex task and issues. Citizen science is emerging as a promising avenue for supplementing sparse government networks. Our thematic focus will be to acquire expertise in these cross-cutting tools and approaches. In MTAP-IV, we will ensure that air related expertise is used across the institute to provide meaningful solutions to air pollution problem.

Methodologies and approaches

The W&A Theme will continue to provide methodological and conceptual frameworks for existing and emerging areas of work. Our cryosphere specialists will work on glacier mass balance and complement in situ measurements with remote sensing. They will also continue to measure weather conditions, snow accumulation, and permafrost proxies in high altitude. Colleagues with cryosphere and hydrology expertise will further refine hydrological and cryospheric models. Air specialists will use advanced numerical models and analysis using new data and generate new knowledge about air pollution and ways to mitigate the same.

Contributions to regional programmes

During MTAP-IV, W&A's contributions to the Regional Programmes will include, but not be limited to, the following:

Adaptation and Resilience Building

- To generate climate change scenarios and provide statuses of glaciers and rivers to help frame strategies for adaptation at local levels;
- To assist in local level water- and land-related adaptations, including formulating participatory micro-plans for land and water management;
- To lead activities in spring revivals in all RMCs; and
- To provide emission reduction and water flow data to energy-related adaptation activities.

Transboundary Landscapes

- To initiate research on cryosphere and permafrost in high altitude transboundary pastures to understand how melting of permafrost affects rangeland biodiversity and soil erosion;
- To contribute information for understanding pathways for reducing carbon emissions from deforestation, degradation, and forest fires by identifying various aspects of carbon transport and storage processes;
- To lead activities in spring revivals in transboundary landscapes; and
- To provide understanding of water governance at the landscape level for ensuring livelihoods and mitigation of human-wildlife conflicts.

River Basins and Cryosphere

- To contribute climate change scenarios and quantify their impacts on glacier change and river flows;
- To understand the dynamics of snow, ice, and glacier change and their impact on water resources in the downstream areas;

- To foster understanding of upstream-downstream linkages including erosion, sediment dynamics, and the socioeconomic context of such linkages;
- To prepare an inventory of springs and understand the hydrogeological and socioeconomic processes that govern these spring systems; and
- To examine the implications of hydrological changes in river flows on future power and how mountain communities can share benefits from hydropower development.

Atmosphere

- To advance understanding of emission sources and changes in atmosphere composition and air pollution through field work and to support to RMCs in establishing effective air quality monitoring networks;
- To study the impact of air pollution on the environment and human health in collaboration with governments, universities and civil societies; and
- To work jointly with governments, and the public and private sectors to mitigate emissions of greenhouse gases and short-lived climate pollutants for reducing air pollution in all sectors.

Mountain Environment Regional Information System

- To contribute the expertise of our atmospheric scientists, hydrologists and cryosphere specialists to the SERVIR programme and provide all technical inputs needed to enhance the accuracy of models and predictions using remote sensing.

Mountain Knowledge and Action Networks

- To host PhD and Masters students with fellowships under various initiatives and provide them with technical supervision; and
- To contribute our expertise and resource persons to short- and medium-term courses organized by HUC.

4.4 Geospatial Solutions

Background

The advancement of Earth observation (EO) and improvement in geospatial methods to analyse remotely sensed data provides significant opportunity to gain insights into regional scenarios, to integrate local scale processes with coarser scales, to characterise ecosystem conditions and changes, and to analyse effects of different management and development processes on the functioning of ecosystems.

Analysis of a large amount of historic data can be used for retrospective analysis of the impact of different management and development processes on the functioning of the ecosystems. For example, the Global Climate Observing System (GCOS) has declared that 26 out of 50 essential climate variables (ECVs) are significantly dependent upon satellite observations.

Practical use of earth observation and geospatial technology in developing countries are impeded due to lack of access to quality data, appropriate hardware and software, and skilled human resources. In the HKH, inaccessible terrain conditions and lack of investment in long-term scientific research further exacerbate this problem.

The capacity to utilise earth observation and geospatial technology highly vary among the RMCs. India and China have strong capabilities with own national satellite programmes, Pakistan and Bangladesh have national institutions responsible for remote sensing research while Afghanistan, Bhutan, Myanmar, and Nepal have limited capacity.

Regional level data sharing, knowledge exchange, spatial data infrastructure, and platforms are also important to address transboundary challenges to support sustainable livelihoods in the HKH. This has been limited in the region due to lack of appropriate regional cooperation framework and mechanism.

Recent advances in earth observation, near real-time data, in-situ measurements and advancement of information and communication technologies have transformed the way of generating and using information for societal benefits. To make optimal use of these technological developments will require that observation and science programmes be closely linked to decision support structures that translate knowledge into actionable information.

Large gaps exist between global development in Earth observation and adoption of state of the art technology in the HKH. The Geospatial Solutions (GS) Theme aims to bridge these knowledge gaps between global and regional institutes and maintain ICIMOD as a regional knowledge centre for earth observation and geospatial technology.

Advances in the subject in last five years

The importance of satellite-based information to understand earth as a system has been appropriately recognised by global scientific communities including the Global Climate Observation System (GCOS), the United Nations Framework Convention on Climate Change (UNFCCC), and the Committee on Earth Observation Satellites (CEOS). These communities are working towards ensuring free and unrestricted availability of climate and climate-related data for informed decision making. Furthermore, the Group on Earth Observation (GEO) has provided a possible framework of coordinated strategies and investments to ensure complete coverage, availability, and compatibility of earth observation data across the globe. Geospatial information and analysis has been identified as a critical tool for monitoring and reporting key indicators for fulfilling the Sustainable Development Goals (SDGs) of the UN's 2030 Agenda.

There are more than 300 active EO satellites worldwide and 200 more expected in space by 2030. A large amount of satellite data is now freely available and plays important role in global climate change research. The opening of the Landsat data archive by USGS and the innovations developed by other space agencies have enabled the creation of many new applications.

The amount of EO data is doubling every two years. While this rapid growth makes it possible to study the changes in Earth's environment in multi-scalar perspective, it also creates new challenges for storing and using this data. The emergence of cloud-based storage and analysis platforms (e.g., Google Earth Engine, Amazon Web Services) has provided opportunity to access a large volume of data for global and regional scale analysis. Advances in artificial intelligence, machine learning, and big data analytics are enabling scientists to investigate and draw insights from large data volumes.

Unmanned aerial systems, sensor networks, Internet of Things (IoT) and crowdsourcing have contributed to allow collaboration on data while also lowering the cost of monitoring. The growth of mobile internet and applications development platforms has generated space to package and deliver customised information to communities in remote and isolated areas. Open source software (e.g., QGIS, R), collaborative development platforms (GIT Hub), the emergence of code sharing culture, and falling cost of computer hardware have also democratized access and use of earth observation and geospatial data.

ICIMOD plays a crucial role in promoting the use of earth observation and geospatial technologies in the HKH and contributes to building the capacity of institutions in the RMCs to use geospatial data and tools. During the last five years, the GS Theme, in collaboration with ICIMOD's Regional Programmes, has developed various new tools and frameworks to utilise EO data and integrate them into decision support systems.

These tools and frameworks have been developed and tested in small areas and are now being upscaled to cover larger geographic areas and address various environmental issues.

During the past decade and particularly during MTAP-III, operational frameworks were developed for drought and flood monitoring, land cover and land use change assessment, forest carbon monitoring, vegetation mapping, and multi-scale biomass assessment. The land cover change data was used to prepare the Forest Reference Emission Level for Nepal and submitted to UNFCCC by the Government of Nepal.

The GS theme has developed innovative methods for the following research work:

- Forest vulnerability assessments and adaptation planning
- Mobile-based data collection
- Landscape planning for resettlements using Geoplanner;
- Agent-based modelling for forest resource management;
- Participatory 3D modelling for community engagement; and
- Multi-scale flood risk mapping;

GS also initiated new research on several fronts, including:

- A UAV system for glacier monitoring and biomass estimation;
- Artificial intelligence for ecosystem assessment;
- Interactive platform development for stakeholder consultation; and
- Habitat modelling for large cardamom.

More than 30 applications were developed and hosted in ICIMOD's redesigned mountain geoportal. Our regional database system (RDS) was upgraded to provide easy access for data sharing and data visualisation. All of these recent developments at the Centre will be useful for MTAP-IV.

Thematic focus for MTAP-IV

During MTAP-IV, GS will maintain its role as the interface between global developments in Earth observation and geospatial technology and their use in ICIMOD's regional programmes. GS will continue to acquire knowledge on advances in Geospatial Information Technology (GIT) and satellite image processing. Building on our current strength in processing optical satellite data, we will develop additional capacity for emerging techniques such as hyperspectral, RADAR, and LIDAR remote sensing. GS staff possess strong skills in developing application portals based on open source and proprietary platforms. These skills will be extended to developing applications on cloud-based platforms such as the Google Earth Engine. We will take a strong focus on enhancing our skill in geostatistics, IoTs, machine learning, artificial intelligence, high performance and cloud-based computing, data assimilation and land surface modelling, UAVs and mobile system for data collection, and geospatial big data analysis.

To develop the delivery of information services for enhanced decision making, GS staff will:

- Conduct needs assessments for our system users;
- Engage stakeholders;
- Assess our current products and data gaps;
- Design and deliver high-quality training; and
- Design, plan and implement science and policy exchanges.

Methodologies and approaches

During MTAP-IV, GS will continue to develop the following methodologies:

- Observation and monitoring biophysical and climatic variables using earth observation data and various sensors and survey technologies;

- Harmonisation of existing data to develop regionally consistent dataset;
- Integration and assimilation of remote sensing data with in situ observation and land surface models to generate contiguous time series data sets;
- Develop data quality and metadata standards for spatial and aspatial data;
- Access, process and analyse data from different satellites and sensors including optical, hyperspectral, radar, and altimeters;
- Geospatial analysis and modelling for upscaling and outscaling the pilot studies implemented by RPs; and
- Analysis of user demand and develop needs-based information services.

GS will fortify existing collaborations and linkages with global and regional knowledge organisations and seek new collaborations to enhance ICIMOD's development in geospatial sciences and to promote the HKH agenda in global mountain forums.

Contributions to regional programmes

GS will support Regional Programmes to integrate spatial analysis in their research and develop information services to deliver actionable information to target users. During MTAP-IV, GS's contributions to each programme will include, but are not limited to, the following:

Adaptation and Resilience Building

- Vulnerability assessment;
- Resource mapping and assessment; food security analysis;
- Change detection using high-resolution satellite data;
- Mapping census and socioeconomic indicators;
- Evaluation of status and potential of high-value crops;
- Spatial planning;
- Accessibility analysis to improve rural livelihoods;
- Gender-disaggregated database and gender mapping; and
- Information system development for national and local level adaptation planning.

Transboundary Landscapes

- Spatial framework for transboundary landscape management;
- Land cover and land use mapping and change monitoring,
- Vegetation and soil mapping;
- Landscape modelling;
- Support to REDD+ initiatives;
- Artificial intelligence for ecosystem services assessment;
- Rangelands productivity assessments in the context of climate change;
- Analysis and modelling livestock and wildlife interactions and competitions to support resource governance;
- Forest monitoring and biodiversity assessment;
- Soil assessment;
- Habitat suitability and risk assessment;
- Decision support tools for protected area management; biomass estimation;
- Mapping potential recreation and ecotourism sites and support sustainable tourism development; and
- Analysis and modelling livestock and wildlife interactions and competitions to support resource governance.

River Basins and Cryosphere

- Remote sensing based monitoring of snow, glaciers, glacial lakes;
- Glacier and snowmelt modelling for water availability in the catchments;
- Identification of glacial lakes for regular monitoring to reduce glacial lake outburst floods (GLOF) risks;

- Remote sensing-based permafrost mapping and inventory;
- Optimum use of high resolution images and UAVs for cryosphere monitoring;
- Satellite rainfall estimation and downscaling, land surface modelling;
- Use of RADAR remote sensing for landslide monitoring;
- Application of satellite altimetry for water level monitoring; and
- Integration of hydrological and meteorological data for regional flood and drought monitoring and warning.

Atmosphere

- Forest fire monitoring;
- Remote sensing based aerosol mapping;
- Integration of in situ air pollution and black carbon data;
- Mobile based monitoring of air pollution;
- Remote sensing applications for fog monitoring and warning; and
- Remote sensing applications for air quality monitoring.

Mountain Environment Regional Information System

- Development and implementation of data and metadata standard;
- Operationalize data management plan;
- Develop data integration and sharing portal;
- Geospatial application portal development;
- Development of data visualisation system;
- Drought monitoring and forecasting for food security and agro-advisory;
- System development for disaster early warning and risk reduction;
- Data assimilation and land surface modelling;
- Forest cover monitoring;
- Forest carbon tracking;
- Forest fire monitoring and early warning;
- Crowdsourcing and mobile based application development; and
- Curriculum development for GIS and RS training.

Mountain Knowledge and Action Networks

- Training university faculty within the Himalayan University Consortium;
- Internships and exchange programmes;
- Collaborative research in partnership with universities;
- GIS/RS training manuals and curriculum development;
- GIS data and satellite image support;
- GIS/RS programmes focused on youth; and
- Linkages with international universities and institutes.

5. Regional Programmes

5.1 Adaptation and Resilience Building

The Himalayan Monitoring and Assessment Programme (HIMAP) observes that the HKH has been undergoing transformative change over the past few decades, particularly with human mobility, the introduction and improvement of physical and electronic communications infrastructure, and greater integration of the local economies with the national and often global economic system. These changes are characterized by major transformations and persistent problems: increasingly diversified rural livelihoods, persistent rural poverty, and accelerating natural resource degradation. Increased climate variability and climate change have further accentuated these changes, creating new challenges that compound vulnerability in the region while also opening up unexpected opportunities. Studies suggest that the impacts of climate change are likely to be more severe in the mountain areas, and given the dependence of a large proportion of the mountain population on climate-dependent livelihoods like agriculture, livestock, and forestry, susceptibility to climate risks will likely be enhanced for these populations. Globalization, climate change, demographic changes and rapid urbanization add another layer of complexity to this already complicated scenario for mountain communities.

Mountain communities in HKH countries, and in particular those located remotely, are most vulnerable to climate change impacts (especially disasters due to extreme weather events). There are several subsets of highly vulnerable groups in the HKH such as women, migrants, indigenous peoples, urban slum dwellers, migrant-sending households, and minorities whose adaptation needs deserve special understanding and targeted action. Deep and pervasive structural inequalities in HKH societies make adaptation even more difficult for poor and marginalized people. Entitlements to elements of adaptive capacity (e.g., ownership of productive assets, access to services of local government agencies) are typically socially differentiated, which affects the uptake of coping strategies. Caste hierarchies and patriarchy-led gender restrictions have also been found to act as barriers for socially marginalized groups who wish to access certain institutions and adaptation options that are easily accessible for “higher” castes.

From our interventions during MTAP-III, we draw a lesson that although there has been a shift from farm-based livelihoods to a combined subsistence-labour system (suggesting a diversification of the livelihood portfolio of mountain households) rural people cannot subsist without land-based agricultural, livestock, and forestry activities. The impacts of climate change and market dynamics severely constrain and compromise the ability of these marginal farmers and smallholders to maintain a decent livelihood. The situation, therefore, demands the development of simple, low cost, resilient solutions for mountain agriculture and livelihoods. We have also learned about the necessity to exercise caution while encouraging such activities. There is need to be cautious about changes in land use, inclusiveness, in access and tenurial regimes, and environmental considerations. While the development of high value agriculture (including animal husbandry) is crucial to address poverty and enhance livelihoods options, farmers and supporting institutions should not be complacent, as specialized agriculture is historically known to create vulnerability. A related lesson in this regard is in the context of cash crop promotion. The land use changes and resultant consequences this action has on access and tenurial regimes, particularly in the context of common property frameworks, can be significant.

Gender inequalities, however, persist and are compounded further by other social stratifying elements such as class, caste, ethnicity, marital status, all of which disproportionately increases the challenges of creating change for mountain women. It is imperative that the capabilities of mountain women, especially those who are poor and marginalized, are significantly strengthened. Women’s abilities, and the abilities

of marginalized people need to be enhanced to better manage resources, and increase their access to resources, technology and finances so they may respond more effectively to the challenges of change and improve their capacity to act within development pathways.

Effective adaptation requires enhancing adaptive capacity – a term which implies the need for change in institutions and institutional processes for better governance. The roles of local institutions in structuring the risks and vulnerabilities, creating incentive frameworks, and mediating external interventions to facilitate adaptation is well-recognized as a critical requirement for enhancing adaptive capacities and building resilience. The programme understands resilience as the ability of an individual, community, or a socio-ecological system to not only overcome a stress, shock or set back (recovery, or bounce back) but develop capabilities to move forward to a condition or state that can help transcend to a better state. Research suggests that while market and institutional access are important determinants of the effectiveness of adaptation strategies, equity and governance factors determine the level of access of various social groups to markets and institutions. Institutional capacity building, particularly for the poor and marginalized, is a critical area requiring focused attention and support if mountain communities are to become more resilient.

Rationale for the programme

The lessons from the preceding MTAP would suggest that although mountain livelihoods in the HKH are undergoing change, these are incremental and not sufficient to enhance the resilience of mountain communities. Efforts are still required to bring about a ‘transformative change’; a change which helps an individual, community or socio-ecological system graduate to a state of desired socioeconomic improvement at a significantly higher level than existing ones. The HIMAP chapter on Adaptation observes that ‘Incremental strategies may not always be able to deal with large non-linear changes or conditions of high uncertainty, including the surprise that may characterize some of the anticipated climate change impacts. When the degree of external change becomes high, a large change in adaptation response or ‘transformative adaptation’ may be required. In order to streamline adaptation planning and actions within such large-scale drivers and complexities, HKH countries must initiate transformative adaptation. However, strategic planning for transformative development has only just begun in a few selected HKH countries, while the need for transformative adaptation is yet to sink in [with the others].’ These observations provide the foundational rationale the Adaptation to Change Regional Programme for MTAP-IV. It is evident that despite the progress made to date on enhancing the adaptive capacities of mountain communities, concerted efforts are still needed to facilitate transformative change and resilience building for the region.

Building on the progress made during MTAP-III and the lessons learned therein, ARB will endeavor to better equip mountain communities to deal with risks and vulnerabilities arising out of socioeconomic and environmental change while also building their capacities to harness emerging opportunities.

Limited access to climate information services continues to be a key factor that constrains the ability of mountain communities across the HKH to deal with risks and vulnerabilities, particularly in regard to agriculture, animal husbandry, forestry, and natural hazard risk reduction. The Programme will make efforts to address this, introducing mechanisms that can tap into existing knowledge and data bases and help provide reliable climate services through innovative but penetrating methods that reach the remotest communities. Efforts will also be made to build institutional mechanisms through improved access to such services that can strengthen early warning systems to deal with climate hazards and enhance disaster risk reduction capacities at local levels. Diversification of livelihoods will continue to remain a central focus, and efforts will be made to harness emerging opportunities both in the on farm as well as off farm sectors (including responsible tourism development) while ensuring that the approaches adopted are sufficiently gender sensitive and inclusive. The approaches must also ensure significantly enhanced income

opportunities for mountain women, and the poor and marginalized while expanding service provisions and increasing options for employment, entrepreneurship development, and engagement of the youth. While endeavoring to strengthen these elements, specific attention will be paid to ensure issues of access, tenure, and equitable benefit sharing, in particular, access to clean energy and water.

In the context of access, it is important to focus attention on the issue of clean energy. Mountain communities in the rural parts of HKH are still dependent on biomass for meeting their energy needs. The lack or inadequate availability of clean energy also acts as a barrier to development of enterprises. Recognizing this gap, and building upon ICIMOD's past experience on decentralized renewable energy options in mountain areas, clean energy access will be an important focus for the Programme. We will also take steps to strengthen community-led ecosystem services management, with a strong emphasis on conservation and management of hydrological services.

Lessons from MTAP-III clearly point to the need for enhancing institutional capacities, in particular of local organizations, and specifically organizations for the poor and marginalized. This is a critical area in resilience building; the Programme will ensure that a significant proportion of its effort is devoted towards institutional capacity building to enhance abilities of these agencies to manage change.

Our work in MTAP-IV will center on a solution-oriented approach, which incorporates adaptation into a broader concept of resilience-building using both traditional knowledge systems and modern science. There is a need to develop targeted adaptation and resilience solutions for the HKH which are appropriate and relevant to the needs of stakeholders at different levels, and which take into account mountain specificities. In addition to the knowledge that has already been generated, field-level piloting will be complimented with additional research in order to fine-tune approaches and ensure their suitability for the HKH context.

Outcome and outcome indicators

Outcome

- Enhanced resilience of women and men of the HKH to socioeconomic and environmental changes, including climate change.

Indicators

- Number of women and men who benefit from innovative interventions by reducing poverty, risk and vulnerabilities leading to resilience
- Number of local institutions adopting gender sensitive, risk reduction and resilience building practices in areas of community DRR, tourism access to clean energy, natural resource management, value chain development, and adaptation to climate change
- Number of regional, national, and sub-national institutions making use of the gender sensitive Resilient Mountain Solution Approach promoted by the programme that reduce poverty, risks and vulnerabilities and promote resilience.
- Number of mountain-specific national or sub-national development policies making use of recommended practices and knowledge.
- Effective regional knowledge and experience sharing mechanisms supporting regional member countries to promote mountain-specific resilience practices.
- Number of global fora at which ICIMOD's mountain-specific resilience agenda are promoted by regional member country representatives and institutions.

Target beneficiaries and intermediaries

Beneficiaries

- Mountain and downstream communities, especially women, the vulnerable, indigenous, and marginalized groups in the region.

Intermediaries

- Civil society groups;
- Research institutions working on community adaptation and resilience building;
- Traditional knowledge system holders;
- National-level policy, planning, and implementation agencies in RMCs (e.g., relevant ministries, line departments, and other agencies that are responsible for poverty reduction and resource management in the region); and
- Global and regional institutions

Approaches and impact strategies

The Programme's concepts on transformative change and resilience building will be translated into action on the ground through collaborative action research and pilots. Action research and pilots will be designed and implemented in active collaboration with partner institutions and communities preceded by a participatory consultative process for identifying issues, concerns and hurdles that influence or hamper transformative change and resilience building. While the action research will aim to test hypothesis, approaches or interventions designed to address the identified issues and concerns, pilots will involve demonstration of tested innovative approaches – technical or institutional, or a combination of both – designed to develop solutions to overcome identified barriers, thereby contributing to development of replicable packages that help in facilitating transformative change and resilience building.

The core principle of the Programme's implementation strategy will be to foster co-creation of knowledge, approaches, and innovative solutions. Participatory approaches, involving partners and target populations, will be an integral part of intervention design development and implementation plans. Concerted efforts will be taken to encourage a synergetic production of knowledge, which builds on local knowledge with a strong blending with appropriate scientific inputs. Community-based approaches will be promoted for developing innovative technical and institutional solutions to address jointly identified adaptation imperatives, ensuring that such solutions are simple and low-cost, but effective.

Community-based approaches have been criticized for their frequent lack of consideration for ecosystem heterogeneity and intra-community dynamics as well as the differential access and rights to resources. To address this, the Programme will ensure that sufficient consideration (and importance) is placed on blending and balancing community-based approaches with ecosystem-based adaptation. While developing and designing interventions, care will be taken to ensure that considerations of income enhancement and livelihood security do not compromise and dilute ecosystem considerations. The Programme recognizes that balancing conservation interests with development compulsions is a fundamental issue of supply of and demand for ecosystem services. Therefore, livelihood considerations cannot be sustainable or resilient if sustainable management of ecosystem services are not properly considered. We will work closely the Transboundary Landscape programme and the Ecosystem Services theme to optimize and operationalize this approach.

The Programme's efforts to encourage diversification of livelihood options are centered around value chain development of mountain products and services. With the focus of such core activities focusing on income enhancement and strengthening market linkages for rural producers, private sector engagement and partnership building becomes a critical component for our implementation strategies. The Programme recognizes that if meaningful private sector engagement is to be developed, such partnerships need to move beyond corporate social responsibility (CSR) approaches and graduate to strong business ventures. However, the private sector will show interest and venture into such partnerships only if such cooperation will support their business interests. Therefore, private sector engagements will be fostered to promote the following objectives:

1. Transforming rural producer groups and/or their agencies into strong actors in the value chain, contributing to the effort of aggregation, ensuring quality, and maintaining attributes demanded by the market;
2. Promoting opportunities for semi-processing and value addition, and
3. Partnering in the development and promotion of mountain niche products and services that provide a comparative advantage and benefit the mountain producers as well as the private sector partner.

These objectives, if adhered to, can help in fostering business partnerships with the private sector and help them transcend beyond conventional CSR approaches.

Finally, the Programme will make concerted efforts to encourage regional collaboration and learning. Peer learning and cross-infusion of experience and innovations across the HKH will continue to be a fundamental approach. Attention will also be given to encourage regional networks of community practitioners. The Programme is aware that extending and consolidating networks – locally and at national, regional, or international scales – can contribute to increases in ecosystem resilience. Sufficient effort will be made to strengthen networking for cross-learning at the regional level.

As a core element of our impact strategy, the Programme will develop a Theory of Change and Impact Pathways in the first year of the MTAP. Initiatives within the Programme will build their respective Impact Pathways, but within the framework of the Programme. To ensure impact, the Programme will encourage each Initiative to also develop a participatory Theory of Change and impact pathway for each major intervention that involves the implementing partners and prime beneficiaries. We believe this action will not only ensure effective implementation, but also foster stronger ownership of the interventions by partners and the target populations while paving a pathway for sustainability and upscaling. Specific Programme level strategies and plans for upscaling innovation will be prepared and implemented.

Cross-cutting issues addressed by the programme

Gender integration and governance are two critical cross-cutting areas central to ARB.

Several studies have highlighted crucial barriers (e.g., inequitable distribution of rights, resources and power; repressive cultural rules and norms) that limit the full participation of women, and marginalized communities in natural resource management, climate adaptation, and other development activities. In response, Adaptation to Gender considers gender and social inclusion as fundamental for creating interventions that successfully strengthen and empower women and the marginalized to adapt to and manage change. We will make systematic efforts to enhance the capacity of women and other socially excluded groups in taking leadership to claim their rights to productive resources and services. In particular, ARB will focus on:

- Fostering increased participation of women, poor, indigenous, and marginalized groups in decision making processes, as well as management of natural resources and ecosystem services at the community level; and
- Promoting women's economic rights and control over resources, including participation in livelihood diversification projects and entrepreneurship training.

Institutions are understood as set of rules that determine the behaviour of actors and the interactions among them. They determine who is eligible to make decisions in different arenas, what actions are allowed or constrained, what aggregation rules will be used, what procedures must be followed, what information must or must not be provided, what payoffs will be assigned to individuals, and how outcomes and processes will be monitored.

Institutions can be either formal (statutory) or informal (traditional). Formal institutions are generally linked to official, governmental, or bureaucratic formalities and are usually legally binding. They include constitutions, statutes, common laws and governmental regulations, which are externally enforced.

ICIMOD will work with both types of institutions as and when required, providing input to formal initiatives, where present, and helping to build and strengthen traditional knowledge systems and local level resource management institutions.

ARB will engage with a wide range of partners including national and regional institutions, strategic and policy partners, and operational and research partners. While engaging with partners to conceptualize, plan, and implement interventions, and/or to manage results, and disseminate knowledge, the programme will endeavor to address institutional capacity building needs through trainings and workshops, peer learning, and exposure visits. In order to ensure impact and sustainability, we will focus on upscaling approaches through close collaboration and engagement with local to regional level stakeholders, and investing in support to implementers who upscale and outscale the approaches.

The Programme will also draw on the principles outlined in the Research to Use and Upscaling section for ensuring successful upscaling and outscaling. At the outset, identifying and involving key stakeholders across scales will be encouraged to facilitate the recognition of key concerns and the designing of implementation approaches. This approach will also be encouraged while designing interventions and developing adaptation and livelihood solutions to address identified concerns and barriers. Such an approach, we believe, will enhance acceptability and ownership of interventions and solutions, thereby setting the stage for replication and outscaling. Engagement with key stakeholders from the initial stages will help foster common objectives and the development of joint ventures. With joint monitoring for capturing lessons and good practices and setting mid-term corrections, ownership and the potential for scalability should be enhanced. Finally, the Programme will encourage and support key partners to take ownership for disseminating and sharing events aimed at policy makers for upscaling. Such an approach should help in co-creation of knowledge and solutions which can be brought into policy and practice through joint efforts.

Results framework

Outcome: Enhanced resilience of women and men of the HKH to socioeconomic and environmental changes, including climate change.		
Indicators	Means of verification	Assumptions/Risks
1 Number of women and men who benefit from innovative interventions by reducing poverty, risk and vulnerabilities leading to resilience	• Baseline and end-line studies	ICIMOD's work remains relevant in the given policy and climate situations.
	• Evaluation missions and reviews with local communities and other stakeholders	Security of pilot activities is threatened by conflict arising from changing access to resources;
2 Number of local institutions adopting gender sensitive, risk reduction and resilience building practices in areas of community DRR, tourism access to clean energy, natural resource management, value chain development, and adaptation to climate change	• Partner reports; reports from associated local stakeholders including local authorities	Pilots are subject to external risks (e.g., extra-regional and global developments)
3 Number of regional, national, and sub-national institutions making use of the gender sensitive Resilient Mountain Solution Approach promoted by the programme that reduce poverty, risks and vulnerabilities and promote resilience.	• Partner reports; institutions presentations, documents and reports; evaluation missions	Interest in regional collaboration on adaptation and resilience building is low

4 Number of mountain-specific national or sub-national development policies making use of recommended practices and knowledge.	<ul style="list-style-type: none"> • Policy documents; process report/ workshop reports; evaluation missions 	Policy-makers continue to take interest in knowledge on resilience enhancement and needs for adaptation;
5 Effective regional knowledge and experience sharing mechanisms supporting regional member countries to promote mountain-specific resilience practices.	<ul style="list-style-type: none"> • Internal monitoring reports; workshop reports; records of communication between stakeholders 	Climate change and resilience issues continue to be of interest to decision makers
6 Number of global fora at which ICIMOD’s mountain-specific resilience agenda are promoted by regional member country representatives and institutions.	<ul style="list-style-type: none"> • Internal monitoring reports; event report; event recordings 	Climate change and resilience issues continue to be of interest to decision makers
Initiatives	Focus Areas	
Developing Resilient Mountain Solutions	Development and implementation of Resilient Solutions pilots; new research in the area of specific, replicable, and affordable solutions	
Promoting Resilient Livelihoods	Pilots and new knowledge on promoting resilient livelihood options for mountain communities, especially women and the marginalised	
Potential: Improving Access to Resources: Financial, Technical and Natural Resources <ul style="list-style-type: none"> • Springsheds • Agriculture production systems • High value natural products • Access to clean energy 	Enhancing capacities of local institutions and agencies of women and marginalized to empower them to better manage resources, and harness opportunities through engagement with government and other institutions to influence cross-scale decision making that affects adaptation and livelihood security. Resources management will focus on financial, technical and natural resources, for initiatives like springsheds, agriculture production systems, high value natural products and Himalayan Centre for Renewable Energy and Energy Efficiency.	

5.2 Transboundary Landscapes

The United Nations Convention on Biological Diversity (CBD) advocates the use of landscape and ecosystem approaches for managing biodiversity, an approach that implies coordination and cooperation among all those responsible for an area, regardless of jurisdiction, as defined by ecosystems rather than administrative boundaries. Since the endorsement of the landscape approach in 2004, it has earned attention as vital for sustainable and equitable development.

The HKH is well known for geo-hydrological, biological, cultural, and aesthetic values. It harbors a wide range of biodiversity and ecosystems, which provide numerous services in terms of climate regulation, water, food, and cultural values, all of which are subject to climatic and non-climatic changes that are affecting the livelihoods and resilience of communities living within the region as well as in downstream areas. This region traverses eight countries with ecosystems and ecosystem services moving irrespective of administrative boundaries. This makes the landscape approach well-suited to the HKH.

ICIMOD’s transboundary landscape approach visualizes conservation and the sustainable use of natural resources at the scale of larger landscapes defined by ecosystems. Guided by the four north-south transects for the HKH and six identified transboundary landscapes (Kailash, Kangchenjunga, Far Eastern Himalaya, Hindu Kush Karakoram-Pamir, Everest, and Cherrapunjee-Chittagong), Transboundary Landscape (TL) programme aims to enhance socio-ecological resilience to environmental change. Of

these six landscapes, we have four operational initiatives: Kailash Sacred Landscape, Kangchenjunga, Hindu-Kush Karakoram Pamir, and the Far Eastern Himalayas. In MTAP-IV, our fifth initiative, the regional REDD+ Initiative, will be embedded in this programme to incorporate incentive-based mechanisms related to greenhouse gas emissions, carbon sequestration, and biodiversity conservation at the landscape and regional scales.

It has been realized that sustainable management of ecosystems in a fast changing climate can only be achieved by following an integrated approach that recognizes the transboundary nature of ecosystems, and the flow of services beyond administrative boundaries. 'Framework for Trans-Himalayan Transect and Landscape Approach' for the four north-south transects and six identified transboundary landscapes identified by ICIMOD in the region, are recognized by several global conservation and environmental organizations such as the CBD and UNESCO. Landscape approaches were primarily rooted in conservation and the science of landscape ecology. Biodiversity conservation in particular has been addressed in a "landscape context" since the early 1980s, and early conservation theory promoted landscape-scale thinking through the principles of island biogeography. The expanded focus of conservation implementation from protected areas to wider social issues led to the design of integrated development and conservation projects. Given the learning of few decades there is now an increasing acceptance that sectorial approaches to land management are no longer sufficient to meet global challenges such as poverty alleviation, biodiversity conservation, and food production. The pressing challenge of integrated landscape management is to link agricultural practices, institutions and policies with other landscape-scale activities. "Integrated Landscape Approaches" provide a basic framework for balancing competing conservation and development demands and integrating policies for multiple land uses and address SDGs. However, attempts to formalize and characterize what landscape approaches actually represent have resulted in a plethora of interlinked terminology and re-invention of ideas and practices under multiple guises. This has led to delayed uptake amongst policy makers and resistance to implementation on the ground. In short, and given the ICIMOD learning of MTAP-III landscape approaches seek to address the increasingly complex and widespread environmental, social and political challenges that transcend traditional management boundaries. In this context, in HKH we seek balanced out trade-offs between conservation and development at scale that attracts customized interventions and associated investments.

Findings from the ongoing TL initiatives at ICIMOD show that threats to natural systems in the HKH recognize no national boundaries. Accordingly, failure to tackle degradation and plan for risks across these administrative boundaries puts strain on local communities, the environment, and economies in terms of floods, droughts, epidemics, biodiversity loss, climate change, and water-food-energy insecurity. Ultimately, these conditions aggravate poverty, conflict, migration, and the degradation of natural capital, thus increasing vulnerability of people and the ecosystems on which they depend.

In MTAP-III, ICIMOD and partners made substantial progress in four of the six identified landscapes under its purview. We learned that healthy landscapes need further close regional cooperation to fill data gaps and their use, sharing, monitoring, and management. By focusing on transboundary landscapes, ICIMOD understands that sustainable management of ecosystems in a changing climate can only be achieved by following an integrated and participatory approach that recognizes how ecosystems services flow beyond administrative boundaries and across countries borders to ensure rights to resources by local communities. RMCs have initiated national level policy changes and structural reforms such as the devolution of power to local governance units; however, there is more work to be accomplished. Findings from MTAP-III demonstrate that integrated landscape management is flexible enough as an approach to have impact across a wide range of geographies, cultures, and types of actors, institutions, and livelihood needs.

Data and findings from transboundary pilots and associated studies patterns of environmental changes around the globe suggest that the HKH is more vulnerable to climate change than other regions. For

achieving scaled up impacts, financing landscapes to counter climate change effects is gaining attention. In the HKH, REDD+ is emerging as an important instrument for financing sustainable management of forested mountain landscapes, and ICIMOD has been customizing this instrument at different levels across different landscapes. The vision of HKH where transboundary cooperation fosters trust among sovereign nations to overcome ideological, political, cultural and historical barriers, tackle conflict over natural resources, reduce migration pressures, and promote human wellbeing, is gaining impetus.

The overall strategy for scaling up to a landscape approach for people and ecosystems need further integration of multi-stakeholder priorities back by scientific data so that trade-offs between conservation and development can be gauged, and public and private investments customized. Evolving from a transboundary scale to regional cooperation in the HKH will require adopting of common frameworks and methodologies, long-term research and monitoring, data and information sharing, collaborative management, capacity building, and evidence-based impacts to influence policy-science-practice for shaping conservation and development strategies.

Rationale for the programme

Transboundary landscapes initiatives at ICIMOD redefine conservation and development perspectives through multi-stakeholder engagement and have shown that transboundary cooperation through agreed Regional Cooperation Frameworks, and south-south dialogues are essential to forge collective new solutions for mitigating governance deficits. Our initiatives have also demonstrated that transboundary cooperation adds value to livelihoods at scale while securing ecosystem services, and enhancing both social and ecological resilience.

Lessons from MTAP-III underline common transboundary challenges for the HKH:

- How to reach to common management of shared ecosystems and bio-resources given plethora of local and transboundary scale problems such as Human-wildlife conflicts, Forest fires, Illegal wildlife and Non-timber forest products (NTFP) trade?
- How to ensure water security in upstream-downstream contexts given degrading impacts of climate change on permafrost, glaciers, springsheds and wetlands?
- How to mainstream standardised frameworks, research protocols and pilot best practices to influence policies and national development strategies for transboundary cooperation?

Though there exist bilateral cross-border mechanisms between countries that address social, ecological and economic issues, these have been found inadequate to address the complexity of challenges mentioned above. However, all RMCs have committed to global conservation and development targets—such as Aichi 2020, Paris Agreement 2015, the SDGs – so that mutual benefits as designed can be successfully scaled-up and implemented. Conservation and development planning derived from national climate policies, National Biodiversity Strategy and Action Plans (NBSAPs) and existing deficient cross-border governance mechanisms show that an effective regional cooperation among RMCs is imperative.

All RMCs have now ratified/or are ratifying the Paris Agreement (2015) and submitting their Nationally Determined Contribution (NDCs), which is a major step and commitment to reduce emissions by restoring degraded landscapes. REDD+ as a global policy and performance-based payment instrument can contribute to climate change mitigation at regional scales by:

- Building the foundations for green economies;
- Reversing the degradation of croplands, rangelands, forests, wetlands, soils, and peatlands; Increasing forest and agricultural production and food security; and
- Strengthening the rights and ensuring the livelihoods of local people.

In addition to these direct benefits, REDD+ also help address other challenges such as climate-induced disasters and energy security at local levels. Similarly, the Regional REDD+ Initiative cuts across sectors and has potential to link with the financing architecture of the UNFCCC or other national level payment

systems. As the UNFCCC and its financing instruments have suggested the use of regional centres and this fits very well for ICIMOD being amongst regional centers working at landscape level in the HKH.

Evidence indicates that joint management over shared resources, though challenging, not only makes management more effective but also facilitates cooperation and peace, particularly when underpinned by economic and political linkages. Thus, the transboundary approach also presents a viable opportunity for TL to contribute to national and international agendas (e.g., NBSAP, UNFF, Aichi targets) while conforming to global commitments and mainstreaming internationally accepted standards. Given the needs for long-term governance mechanisms for transboundary landscapes in the HKH, an institutional framework for regional cooperation addressing the above issues should be established.

The TL programme has contributed to The South Asia Water Governance Programme for better management of the three primary Himalayan rivers (the Ganges, Indus and Brahmaputra). The programme brings associated countries together to tackle transboundary challenges, such as flooding, water for irrigation and maximizing hydropower potential, which are common to all countries sharing these rivers. Therefore, TL outputs will be aimed to build resilient economies and minimize risks and disasters. Within SAWGP, TL will support cross-border engagement through: facilitating new opportunities for constructive and relevant cross-border stakeholder dialogue; produce knowledge and build capacity for a common understanding of the problems and solutions to regional water resources management and climate adaptation; and finally contribute to improving the quality of investments at landscape scale benefiting river management.

For MTAP-IV, TL will work to address deficits in capacity building and skills (e.g., entrepreneurship) to better harness transboundary scale opportunities. Through country consultations, we have learned that all RMCs are demanding evidence with which to customize their policies, practices and scientific foci that can minimize the vulnerability of people and strengthen ecosystem services linkages in the upstream-downstream contexts of the HKH.

Outcomes and outcome indicators

Outcome

- Improved transboundary cooperation among member countries demonstrated through regional policies and strategic partnerships leading to sustenance of mountain ecosystem services and equitable livelihood benefits at regional landscape level.

Indicators

- Number of sub-national, national, regional and global institutions and networks using programme inputs for developing good quality and inclusive projects, programmes, research/monitoring protocols, frameworks, and guidelines in mountain landscapes (including a mix of forests, rangelands, farming systems, soils, springsheds, watersheds, wetlands, peatlands) for sustenance of ecosystem services and poverty reduction.
- Number of high quality long-term research and monitoring results used for development of approaches to transboundary management, planning and implementation that are suitable to the complex biophysical, social-cultural and historical relationships within the HKH
- Number of policies and decision making processes influenced at sub-national, national, sub-regional and regional levels leading to sustainable landscape management and effective regional cooperation.
- Number of references showing ICIMOD's highly quality contributions to global agenda settings (SDGs, UNFCCC—Global Landscape Forum, IPBES, IPCC and CBD) and commitments (NDC) for promoting sustainable mountain development.
- Number of women and men benefited in equitable manner by integrated conservation and development approaches in identified transboundary landscapes leading to sustenance of ecosystem services and poverty reduction.

Target beneficiaries and intermediaries

Beneficiaries

- TL beneficiaries consist of local communities and stakeholders directly dependent on ecosystem services at scale. This group includes, but not only, farmers, forest dependents, marginalized and indigenous populations, and women and youth. However, this include indirectly also all downstream communities who benefit from water security, carbon sequestration, and marketing of mountain products.

Intermediaries

- Governments at provincial and national levels;
- Within governments, ministries and departments with relevance to environmental and transboundary issues, such as rural development;
- Civil society;
- Media – print, radio, television, and internet-based;
- Academic and research institutions
- Private sector partners; and
- Global fora, including regional policy think-tanks, financial institutions, and development agencies.

Approaches and impact strategies

The centerpiece of Transboundary cooperation is the “Landscape Approach” that pivots on multi-stakeholder analysis and dialogue to facilitate:

- Common understanding and priority setting on conservation and development needs at scale;
- Collaborative planning and effective implementation; and
- Monitoring of progress and performance.

TL’s planning and outcome-orientation is a collaboration with key country partners, guided by the “Theory of Change and Impact Pathways” that aims to add value through potential livelihood opportunities such as value chain development and private sector partnership with linkages to sustaining the flow of ecosystem services for local communities. However, at higher-levels intermediary actors and institutions must be involved to take up outputs and convert these to outcomes at the policy and practice levels. These intermediaries are crucial for triggering catalytic measures such as promoting good resource governance, market-interface of value chain products and connect to local investment sources with the results on inclusive local and regional economic provisions, adaptation to fast changing environmental conditions, data availability and use through long-term environment and socio-ecological monitoring systems, and accessing finance through incentive based mechanisms. The knowledge generated at scale by the TL initiatives will be used to strengthen networking platforms and strategic dialogue mechanisms for regional cooperation and for informed decision making.

Successful implementation of transboundary landscape approaches will require ownership by and leadership from ICIMOD’s RMC. Thus, TL will works toward this goal by cooperating with nodal ministries in the RMCs, and partnering with relevant credible academic institutions, NGOs, INGOs, private sector actors, development partners, strategic learning and policy influencing networks, and local governance bodies.

TL will promote interdisciplinary collaboration in the RMCs by integrating research and monitoring protocols, new knowledge sharing platforms, standardized methodologies, and tools and frameworks. TL will build on the incentive payments for environmental services paradigm, ecosystem-based adaptation, connectivity-corridor science, multi-stakeholder consultative policy-making, and climate resilience building. We will collaborate with other regional programmes (Adaptation to Change, RB&C), as necessary, in this work.

TL recognizes the increasing role of the private sector as a potentially important agent of change. As such, TL will work with the private sector to leverage its strengths to assist ICIMOD's work in sustaining and upscaling livelihoods, and developing enterprises at local and regional levels. Like RB&C, TL initiatives offer a wider spatial arena for the uptake of learning on topics such as resilient mountain villages, disaster risk reduction and early warning systems so that common activities and outputs can be synchronized for strategic institutional outcomes.

We will contribute data taken from our representative pilot sites across the HKH to global initiatives such as GLORIA (Global Observation Research Initiative in Alpine Environments), International Long Term Ecological Research (ILTER), and GLOCHAMORE (Global Change and Mountain Regions) Research Strategies to make these initiatives more statistically robust. In MTAP-IV we will scale out lessons learned from our REDD+ pilots. This applies also for scientific frameworks, gender and inclusive process tools, livelihood strategies and methodologies – all of which require mainstreaming across the region through potential institutions, including private sector. TL will also work to ensure greater data utilization for decision making at landscape level. Enabling good practices in a variety of natural resource contexts (e.g., springsheds, watersheds, forests, and rangelands) will be further compiled, disseminated, and up-scaled for transformative development by harnessing public and private finances. Apart from this work, we will submit peer reviewed journal articles, conference papers, documentaries and other knowledge products to disseminate our findings at various and wider levels.

Since several TL processes and practice tools have been tested (e.g., landscape journey, mentorship, Landscape Governance ToT), the programme will sharpen its ongoing institutional capacity building, especially in transnational stakeholdership and leadership, techniques of negotiation, mediation and facilitation, policy influencing, and conflict management. Capacities of partners to deliver impact-oriented outcomes will be a key partnership criteria. We will leverage in-country public schemes as and private sector investments to provide vocational and skill training for local youth and women, particularly in the field of entrepreneurship.

Cross-cutting issues

Gender integration

Landscape scale socioeconomic and demographic changes such as the migration of youth, human-wildlife conflicts, degradation of natural resources, and labor shortages have multiplied the pressure on women to engage in productive labor while also managing households and community projects. Therefore, gender-responsive conservation and development at scale is key to achieving sustainable outcomes in TL. In MTAP-III, by embracing the principles of green and inclusive economies, TL demonstrated that local resources could be value-added to enrich local livelihoods and empower women. Therefore, sustainable leadership in women entrepreneurship and promotion of local entrepreneurial leaders for broad and long-term outcomes will help ensure the protection of human rights and founded on individual, community and indigenous knowledge.

Critical lessons learned to date will be used to counter the marginalization of women in decision and policy making on conservation and development planning. Further emphasis will be given to increasing economic opportunities for women so that incomes, credit facilities, technologies, and knowledge become viable resources for women's empowerment. We will achieve this objective through development and implementation of pro-poor and pro-women climate resilient tools and strategies, and through the establishment of a regional database of mountain women scientists, professionals and gender champions in the HKH. Furthermore, we will promote awareness and skill building for all stakeholder types across all landscape initiatives. Throughout the planning and implementation, and distribution of multiple benefits, we will focus on youth involvement who can substantially contribute to sustainable ecosystem

management, and special attention will be paid to the poor, minorities, caste, ethnicity, and issues of indigeneity.

Governance

Existing cross-border governance interface-mechanisms (e.g., border meetings, information sharing) have been shown inadequate for tackling landscape issues such as human-wildlife conflicts, transboundary trade for high-value products, and illegal wildlife trade. Therefore, good transboundary governance will necessarily be constructed around principles of transparency, equity, flexibility and mutuality – all of which are critical for transboundary cooperation. The strengthening of local institutions and governments, and inclusiveness in decision-making at local and national levels will be supported by mainstreaming of tested tools and capacity building packages (e.g., Landscape Governance ToT, Landscape Journey Tool, Mentorship Concept) to our RMC partners. Institutional diagnostic tools and capacity building packages as part of regular mentorship will be utilized to ensure that good governance finds traction in the delivery of outputs related to conservation and development.

Science – policy interface

Due to impending threats of climate change and global commitments all RMCs have begun to have a review their policies and national strategies (e.g. Climate, Forest, Rangelands) in terms of regional cooperation. This is a prime opportunity for preparing evidence at transboundary scales and contributing to transformative change processes in the region. Therefore, with various cross-cutting programmes at ICIMOD, policy-influencing work will be based on evidence generated at scale. The programmes will contribute toward the design and update of policies and actions of communities and institutions by implementing the rules of policy instruments (e.g., incentive payment for ecosystem services) related to ecosystem management and people’s livelihoods, including resource governance, agribusiness development, and value chain development. Furthermore, TL’s work in policy engagement will focus on:

- Influencing key NRM policies in HKH countries in line with MTAP-III lessons and the focus of MTAP-IV (from local and subnational to national and global levels);
- Strengthening policy engagement/influence around key regional issues and global commitments and obligations (e.g., NDCs, CBD); and
- Enhancing two-way customization for mountain specific agendas in global policy arenas through bodies such as the IPCC, UNFCCC-GLF, CBD, UNCCD, Ramsar Convention, SAARC and IPBES.

TL will continue to build on its previous policy deficit analysis and emerging regional policy issues. Drawing on the Participatory Impact Pathway Analysis (PIPA) process and quasi-experimental field experiments, stakeholders at different levels will be engaged to help identify actors and factors that are key to achieving desired policy outcomes. Networking with key institutions that have been on the forefront of science and policy work (e.g., Centre for Policy Research in India, ICI, ARIES, IPBES, National Focal Points and Task Forces, Planning Commissions, and Policy Stakeholder Forums), will help complement this policy influencing work.

Results framework

Outcome: Improved transboundary cooperation among member countries demonstrated through regional policies and strategic partnerships leading to sustenance of mountain ecosystem services and equitable livelihood benefits at regional landscape levels.		
Indicators	Means of Verification	Assumptions/Risks
1 Number of sub-national, national, regional and global institutions and networks using programme inputs for developing good quality and inclusive projects, programmes, research/monitoring protocols, frameworks, and guidelines in mountain landscapes (including a mix of forests, rangelands, farming systems, Springsheds, watersheds, wetlands, peatlands) for sustenance of ecosystem services and poverty reduction.	<ul style="list-style-type: none"> • Progress reports • Evaluation reports • Annual review reports 	Mountain landscape approaches and frameworks are recognized at various levels.
2 Number of high quality long-term research and monitoring results used for development of approaches to transboundary management, planning and implementation that are suitable to the complex biophysical, social-cultural and historical relationships within the HKH.	<ul style="list-style-type: none"> • Monitoring records on research results • Progress reports • Evaluation reports • Annual review reports 	National and regional stakeholders continue to support regional cooperation based on national/ regional priorities and fund support.
3 Number of policies and decision making processes influenced at sub-national, national, sub-regional and regional levels leading to sustainable landscape management and effective regional cooperation.	<ul style="list-style-type: none"> • National/regional Policy documents • Progress reports • Evaluation reports • Annual review reports 	The political, social, economic and natural environment remains favourable for regional cooperation.
4 Numbers of references showing ICIMOD's highly quality contributions to global agenda settings (SDGs, UNFCCC- Global Landscape Forum, IPBES, IPCC and CBD) and commitments (NDC) for promoting sustainable mountain development.	<ul style="list-style-type: none"> • Document review reports • Annual reports 	The Landscape Approach achieves global traction and recognition.
5 Number of women and men benefited in equitable manner by integrated conservation and development approaches in identified transboundary landscapes leading to sustenance of ecosystem services and poverty reduction.	<ul style="list-style-type: none"> • Beneficiary tracking reports • Progress reports • Evaluation reports • Annual review reports 	Geopolitical situations remain favorable on the ground for communities to realize benefits.
Initiatives	Focus Areas	
HI-LIFE	<ul style="list-style-type: none"> • Development of knowledge products highlighting transboundary landscape linkages and issues; • Promotion of landscape level joint biodiversity monitoring, information sharing platform and conservation of key species and their habitats at scale; • Establishment of regional/bilateral mechanisms for management of transboundary issues; • Promotion of diversified institutional models for conservation management; • Supporting participation of local communities in sustainable ecotourism as link to innovative livelihoods; • Development of value chains and criteria for sustainable utilization of biological resources for both domestic and cross-border trade 	

Initiatives	Focus Areas
HKPL	<ul style="list-style-type: none"> • Promotion of transboundary partnerships for scaled-up Conservation and Development; • Generate water resources availability in the landscape linking cryosphere and downstream land uses like rangelands • Addressing water security issues for livelihoods and biodiversity conservation especially on the large wild mammals; • Promotion of livelihood diversification through livestock (yak), medicinal plants niche products and tourism value chain promotion; • Mainstream bilateral partnerships for leveraging regional programme investment (CPEC, OBOR, PATRIP etc.); • Integrating culture and nature in mainstream development (Environmental archeology)
KL	<ul style="list-style-type: none"> • Connectivity corridor development; • Regional tourism and niche product development and promotion; • Addressing transboundary issue including human wildlife conflict; • Facilitating multidisciplinary and multi-stakeholder approach in landscape management; and • Strengthening regional cooperation through institutional set up and mechanism.
KSLCDI	<ul style="list-style-type: none"> • Common branding of KSL Value Chain products; • Implementation of “Landscape Approach” at transboundary scale; and • Regional scale cooperation on UNESCO World Heritage Status, Responsible Tourism and Value Chain cross-border markets.
REDD+	<ul style="list-style-type: none"> • Developing an enabling environment for demonstrating results based payment mechanism at landscape level that is socially inclusive and environmentally sound.

5.3 River Basins and Cryosphere

The freshwater systems in the HKH are undergoing natural and socioeconomic change. The changes are manifested in terms of the quantity and quality of water with strong temporal and spatial variation. The conservation of water, its sustainable development and management, and its negotiated future use are paramountly important for HKH river basins. Furthermore, taking into account downstream communities, water management and sustainability have ramifications for the prosperity and stability of the entire region and beyond. Water is not only the single most important resource and source of wealth, but also the potential source of catastrophic hazards.

ICIMOD applies an integrated river basin approach to water resources management taking into consideration the management and sustainable use of water and land resources for livelihoods, the impacts on environment, and the pressing need for disaster risk reduction and management of water-related hazards in river basins. ICIMOD works in multiple scales starting from community (catchment) scale to sub-basin and basin scales with national and transboundary issues. Our attempts have been to establish linkages between those spatial scales in terms of, processes understanding and developing solutions.

The cryosphere constitutes an important subset of the hydrosphere (or the river basin regime). The Himalayan cryosphere is a significant contributor to the hydrological budget of large river systems in Asia such as the Indus, the Ganges, and the Brahmaputra. Significant progress has been made in monitoring essential parameters for the management and development of water resources. Cryosphere monitoring (particularly field-based glacier mass balance studies and snow cover area monitoring using remote sensing techniques) has been facilitated by ICIMOD in Nepal, Bhutan and Pakistan, and as a complement to the more established monitoring systems in China and India.

ICIMOD has promoted basin-wide approaches and upstream-downstream linkages to understand physical and social processes and to promote community resilience and benefit sharing in a river basin context. For this reason, over the last five years, we have focused on fostering regional and basin level

dialogues and developing networks of scientists. We achieved some degree of success in regional cooperation and sharing of critical information, but there is much more ground to be covered in this area. While we placed emphasis on generating critical knowledge through research and piloting, we have also had some influence on policy making. From these experiences, we draw a major lesson that we need to strengthen engagements to support policy and practice for greater impact.

The river basin approach is not a new concept but shifted dramatically in the 1970's and 80's as the need to address the multifaceted problems of management, particularly the trade-offs between competing interests and values assumed greater prominence. The Asian Water Development Outlook 2013 (AWDO 2013) recommends that implementing a process of integrated river basin approaches is required to increase national water security and to increase the return on public investment in water storage, productivity, and conservation.

For MTAP-IV, there have been several major developments in regional and global arenas that influence the future direction and priorities of the programme. In 2015, the global community ratified three agreements that have significant implications for the well-being of global communities.

- The Sendai Framework for Disaster Risk Reduction 2015-2030 (Sendai) is the first major agreement of the post-2015 development agenda related to disaster risk reduction. Sendai emphasizes building resilience, promoting local solutions, and fostering inclusion;
- The 17 Sustainable Development Goals (SDGs) and associated targets, and
- The Paris Agreement under the UNFCCC.

Goal 6 of SDGs states “[To] ensure availability and sustainable management of water and sanitation for all.” This has obvious relevance to our programme. The targets set within this goal call for the implementation of integrated water resources management and better transboundary cooperation at all levels. While UNFCCC COP 21 in Paris was largely about mitigating climate change, water issues were kept in particular focus, the Paris Pact on Water and Adaptation to Climate Change, highlighting the importance of sustainable management of water resources, aims to help advance knowledge on the links between water and the climate, and strongly promotes international cooperation.

River Basins and Cryosphere (RB&C) actively searches for policy and places where might enhance our effectiveness through strategic partnership and intervention. The development in the RMCs (e.g., India's “National Action Plan on Climate Change” and China's “One Belt One Road Initiative”) provides future opportunities for this programme. In Nepal, the policy and administrative reconstruction process, and in Bhutan, the National Adaptation Plan, provide space for effective intervention and cooperation. The Nadi Festival in Shillong in July 2016 highlighted the pressing need to revive riverine transport, which could be an area of action for the programme. Bangladesh, the most downstream country in the HKH, has traditionally supported regional cooperation in flood forecasting and in recent years has shown interest in regional hydropower development. In Pakistan, the Pakistan Water Vision and Framework for Action 2025, The WAPDA Vision 2025, and the report of the Water Sector Task Force of Friends of Democratic Pakistan (2012) hold some promise for potential synergistic collaboration.

Rationale for the programme

The HKH encompasses the largest high altitude area in the world, and the tremendous snow and glacial melt feed the ten largest river systems in Asia. The region has witnessed a considerable decrease in glaciated areas with a consequent increase in growing glacial lakes and increasing glacial lake outburst floods (GLOF). However, only a few of the more than 50,000 glaciers and associated glacial lakes are consistently monitored, and there is very little data on snow or permafrost in the HKH. For this reason, cryosphere related impacts on ecosystem, water quality and quantity, geohazards, and livelihoods are anticipated. While there has been progress toward establishing cryosphere-monitoring systems in the RMCs (e.g., Nepal and Bhutan—supported by ICIMOD), the long-term sustainability of those systems is still an issue. Institutionalized monitoring of snow cover and permafrost is still lacking.

In 2015, the World Economic Forum rated water crisis as the top global risk. In the HKH, ICIMOD has predicted, by virtue of its research, that the countries of the HKH will increasingly face challenges in meeting water, food and energy demands due to rapid socioeconomic development, population growth, and urbanization. According to a 2015 Water Resources Institute (WRI) report, several countries in the HKH are facing medium to high water stress, which will be further exacerbated in the coming years. While water is a central entity in the water-energy-food nexus, emphasis is usually placed on quantity, but not quality. Furthermore, scant attention has been paid to immense problems related to erosion, transport, and sedimentation of soil along water courses. This analytical gap stresses the need for a river basin management approach.

The HKH is rapidly urbanizing, yet urban water issues have not received adequate attention in ICIMOD's programmes. MTAP-III made significant strides in understanding the water availability, but we need to turn our focus in MTAP-IV to these rising demands. This calls for initiatives to studies to support integrated, innovative, and inclusive water management at all levels, including analysis at local, national, basin, and regional levels.

The HKH is highly vulnerable to climate change, natural disasters and their associated environmental and socioeconomic effects. The 2010 Indus flood, the 2013 Uttarakhand flood and the 2014 Jure landslide in Nepal are some recent examples. Other climate change impacts include rising temperatures, seasonal droughts in downstream areas, and heat stress. Progress is being made in the RMCs to formulate disaster-related policies and to strengthen forecasting and early warning efforts. Adequate transboundary cooperation in water resources development, disaster management, and user perspectives in disaster management are still lacking. Data sharing remains a lingering problem due to a trust deficit between countries.

Considering these issues and challenges and recent global and regional discourses, ICIMOD sees several opportunities in the MTAP-IV. A river basin approach will continue to be important for water resource management, which provides opportunities for upstream-downstream benefit sharing and promoting incentive-based ecosystem management. There are prospects for developing business models for efficient water service delivery and assessing trade-offs and opportunities. The programme will support regional dialogues and forums with both geographic and thematic focus to foster regional cooperation. There is also a need to continue generating new knowledge in gap areas related to cryosphere research, to support RMCs in cryosphere monitoring and to introduce new methods and techniques for understanding and preparing for downstream impacts.

RB&C will also support RMCs to strengthen their forecasting and early warning capacities with end to end approaches and strong user perspectives. With recent innovations in communication technologies, end to end forecasting is becoming more feasible. Focused research and pilots can support adaptation to climate change and resilience, the latter of which can be closely integrated with disaster risk management practices. There are opportunities to support RMCs in developing their Local Adaptation Plans for Action (LAPA) and National Action Plans (NAP) as well as the implementation of National Determined Contributions (NDC). Private sector engagement will become increasingly important in all sectors, including water, energy, and risk management. The programme should be vigilant towards seeking possibilities for tapping emerging funding possibilities such as GCF and developing climate discourse around loss and damage.

Outcome and outcome indicators

Outcome

- RMC policies, strategies, and development programmes highly critical to water resources management and disaster risk reduction in HKH influenced through robust evidence from scientific research, gender responsive practices and capacity building in the areas of river basins and cryosphere.

Indicators

- Number of policies and strategies using ICIMOD outputs related to integrative and inclusive water resource development and management, and equitable benefit sharing that leads to reduced physical vulnerabilities and reduced poverty.
- Number of organisations effectively using and adopting innovative, gender sensitive, and context-specific water resource management practices at different scales using a water-energy-food nexus approach.
- Number of organizations from RMCs engaged in regional cooperation on cryosphere, climate services, and DRR contributing to reduced physical and social vulnerabilities.
- Number of selected RMCs with substantial amounts of cryosphere in their territory having long-term and scientifically-robust monitoring programmes on these resources.

Target beneficiaries and intermediaries

Beneficiaries

- RB&C's target beneficiaries include communities living in the mountains and downstream of the HKH, particularly the men and women in poor and marginalized sub-groups.

Intermediaries

- Non-governmental organizations;
- National implementing partners;
- Government agencies;
- Academic institutions;
- Development partners; and
- Existing strategic regional and global partners, including the global science community.

Policy makers have traditionally used the products generated by the RB&C. In MTAP-IV, policy makers will be a key beneficiary and we will proactively engage this group. We hope this will form a basis for developing regional cooperation on water resources and disaster management. The programme apprehends the opportunities of collaborating with and working for the benefit of private sector hydropower developers.

The programme sees several intergovernmental, regional and international organizations playing intermediary roles, including SAARC, ADPC, BBIN and ADRC. RB&C will increase cooperation with organizations such as UNFCCC, IPCC, World Bank, IFC, and WMO, and use these agencies to influence and motivate RMCs.

Approaches and impact strategies

Stronger impact orientation

Continuing from the previous MTAP, impact orientation would receive further attention in the programme during MTAP-IV. This would allow us to understand not only perceived impacts, but also help us identify our stakeholders. This work will be backed by Theory of Change and Impact Pathway analysis. RB&C also foresees stronger monitoring and evaluation backed by more stringent baselines, and qualitative and quantitative indicators collected through robust impact evaluation techniques.

Social impacts

ICIMOD's vision statement states its dedication to making positive difference in the well-being of people and the environment. This goal will be achieved through work that focuses on poverty, people's vulnerabilities, and ecosystem services. By virtue of ICIMOD's vision, programme activities should also have strong societal impacts. Although social impacts were a key area for MTAP-III, this sector will take

on even more significance in our upcoming activities. Our social impact strategy may include assessing or estimating, in advance, the social consequences that are likely to affect programmatic actions. It is a process that provides a framework for prioritizing, gathering, analysing, and incorporating social information and participation into the design and delivery of interventions. Therefore the interventions will take into account the key relevant social issues, and incorporate a participation strategy for involving a wide range of stakeholders. Project related activities that have traditionally been only scientific in nature (e.g., cryosphere) will now also focus on social context.

Policy focus

Bridging the gap between evidence, policy, and practice was one of the key commitments of ICIMOD to achieve the goals of MTAP-III. This commitment was reflected in the RB&C programme as outcomes on policy uptake, engagements, and influence. The programme successfully undertakes work on policy engagement, which includes facilitation of policy processes in the RMCs, interaction with policy makers, and creation of customized knowledge products. As policy engagement is gaining significance in programme activities, during MTAP-IV the strategy will stress pairing such activities with stronger communication and outreach plans. This work can already be witnessed in certain initiatives where policy milestones are being used as inception points.

Multi-scale river basin approach

Adaptive 'Integrated Water Resources Management' (IWRM) on river basin scale can offer a flexible yet adequate framework for planning and investments toward policy formulation and regional cooperation. With the growing acknowledgment of climate change impacts, the IWRM approach will support collaboration and institutionalized exchange of data and information, at local and regional levels, for river basin planning and management through establishment of dynamic and accessible river basin data and information systems.

Because environmental governance and management requires a multi-scalar approach, promoting benefit sharing mechanisms, including incentive based mechanisms for upstream communities, become key points. The approach would span from micro-level focusing on small catchments, to a macro level taking transboundary issues, and national basins into account. This would be vital in identifying the important linkages required for making multi-scale basin partnerships work. For example, RB&C is developing regional scale flood information systems and local scale community based flood early warning systems. In MTAP-IV, we will work to create linkages between these two scales.

Methodological robustness

Robustness in both research and practice is key to ensure replicability and scalability of interventions in the RMCs. RB&C will continue to follow robust methods in all aspects of physical and social research, piloting, and demonstration. Cryosphere monitoring triangulates methods: in-situ measurements, remote sensing, and modelling. Together, these methods make it possible to draw a comprehensive picture of the cryosphere at the sub-basin and regional levels. For primary observation of environmental variables, RB&C will follow the internationally accepted standards and norms such as those provided by World Meteorological Organization (WMO) and World Glacier Monitoring Service (WGMS). We will incorporate social scientific methods as appropriate, including statistical analysis, field surveys, case research, and social network analysis.

IWRM and Nexus approach

For decades, global water policy experts have prescribed IWRM as the preferred approach to water issues. However, in the context of the HKH, implementing IWRM faces particular geopolitical challenges that illuminate particular sensitivities around water. As IWRM promotes the coordinated development

and management of water and land and related resources, this process is key to maximizing and distributing the resultant economic and social benefits in an equitable manner without compromising the sustainability of vital ecosystems. It is encouraging that some RMCs are promoting IWRM at the country level and formulating policies with strong IWRM focus.

It is important to note, however, that there is no standard procedure for IWRM practice in other parts of the world. Therefore, from inception, consistent and continuous effort and fulsome involvement of promoters will increase the likelihood of success. Furthermore, a focus on a Nexus approach that integrates water security with other sectors would aid the transitioning of societies toward sustainable economies. Therefore, RB&C considers the Nexus and IWRM approaches as complementary and with great force multiplying potential.

Contribution to emerging issues

HKH countries are experiencing rapid demographic transitions and urbanization. In this context, demand for water far exceeds the municipal supply and many people cope with shortages on a daily basis.

RB&C remains vigilant towards emerging issues like this in the region and seeks opportunities to contribute in meaningful ways. Through research and programming, ICIMOD should look at ways to secure urban water supplies and manage demands for the future. The programme has been working primarily on studying aspects of water quantity, whereas aspects of water quality (e.g., sediment generation) need further exploration in MTAP-IV. Groundwater resources in the mid-hills and interlinkages between groundwater, springs and surface water under changing socio-ecological environment will also be investigated.

In response to these needs, RB&C will further enhance its upstream-downstream approach and seek opportunities to implement this approach at local and regional levels. The programme shall further enhance its work towards understanding water demand and its management. Attempts will be made to develop further understandings of risk related to energy infrastructure. On the cryosphere front, RB&C will strengthen its research on snow cover and permafrost and seek to work with national energy utility companies to develop operational flow forecasting systems.

Himalaya to Ocean (H₂O) concept

For ICIMOD, and specifically for RB&C, mountain systems and communities will continue to be the central focus. However, high mountains (upstream), mid-hills (middle stream) and lowlands (downstream) are intricately linked in terms of physical and socioeconomic processes. In particular, the HI-AWARE initiative has shown the benefits of looking at those geographic entities in a holistic manner, better to understand the drivers of change and vulnerabilities that can lead to improved adaptation and resilience planning. In like fashion, RB&C will implement the H₂O concept, often also called “source to sea concept,” an outlook that attempts to visualize and analyse linkages between the cryosphere, water, climate change, and resilience along transboundary rivers.

Partnership approach

The programme’s partnership approach builds on institutional learning and emphasizes on the need to balance between more traditional contract-management type partnerships with more strategic alliance type partnerships. In the latter case, partners work on the concept of co-creating and designing actions and results, and thus benefit from the process of engagement. Experience from SDIP and HI-AWARE on partnerships with consortium members and portfolio partners demonstrate the value of co-learning and implementing complementary actions. Such strategic partnerships provide value for money in delivering outputs and influencing RMCs to adopt and support related programmes.

Transdisciplinary approach

In addition to multidisciplinary and interdisciplinary approaches, the programme intends to deepen its transdisciplinary approach, in which researchers from different disciplines combine their efforts to create new conceptual, theoretical, methodological, and translational innovations. The need to do this arises from the limits imposed by working within a discipline-specific approach. Therefore, cross-cutting topics such as gender are important aspects in water and hazard management. Through a gender lens, we note that solutions for water and hazard management should be socially inclusive and equitable between genders across various social groups. This would increase benefits while reducing vulnerability. In this way, RB&C will strengthen capacity building and awareness raising to empower local actors, opinion leaders, and national decision makers to translate science cooperation into political cooperation

Dialogues and networking

The river basin approach, especially in a transboundary environment depends a lot on evidence, negotiations and trust. With MTAP-III experience, facilitation of science and technology of co-basin countries and promotion of science diplomacy through conferences, panel discussions, dialogues and programmes shall continue in MTAP-IV. The success of UIB network in MTAP-III calls for further strengthening this network and developing alliance with other networks for delivering the results for greater policy impacts. Examples of flood dialogue in Gandaki River Basin where stakeholders define and take forward the agenda of discussion would be followed in MTAP-IV.

Cross-cutting issues addressed by the programme

Since the river basin approach to water resource management follows the integrated approach, it also address multiple cross-cutting issues:

Gender and social equity

Women play an essential role in the management of water other interlinked resources such as soil, forests, and energy. Women often have a profound traditional and contemporary knowledge of the natural world around them. Attention needs to be paid on the differential causes and effects of environmental degradation on men and women; and, more importantly, the role of women as agents of change in adaptation to the changing environment.

Gender transformative change has been identified as an approach in MTAP-IV. It is well-established that men and women, due to differentiation in their social roles, use resources differently. For this reason, RB&C integrates gender considerations in all activities, including:

- Gender segregated database
- Gender-specific data on vulnerability and building resilience
- Gender-specific data for the water, food, energy Nexus.

In our cryosphere programme, where there are generally fewer women professionals, we will increase our efforts to involve more women in this work, particularly through capacity building with scholarships, trainings, and exposure visits.

Youth engagement

A significant percentage of the world's population falls under the age of 35. The average age of the world population is 28. In many HKH countries, young people make up more than 50 percent of the population. Youth provide great opportunity for innovative water management.

Currently RB&C has been involved in capacity building (short-term and long-term) and involving youth in research. The programme shall work closely with Mountain Knowledge and Youth Networks programme for improved youth engagement.

Governance

In its first Water Development Report (2003) the United Nations stated that the “water crisis is essentially a crisis of governance and societies are facing a number of social, economic and political challenges on how to govern water more effectively”. RB&C conceives governance as a multi-level issue that includes not only formal government entities, but also civil society and the private sector. As well, the programme acknowledges the role of traditional authorities in water management (e.g., farmer managed irrigation systems).

Economic analysis

RB&C will analyse the trade-offs and opportunities of water resources development in basins and sub-basins across the HKH. Incentives for environmental management, socioeconomic analysis of natural hazards, benefit sharing in resource management, and incentivizing ecosystem management for upstream communities will be conducted in MTAP-IV.

Results framework

Outcome: RMC policies, strategies, and development programmes highly critical to water resources management and disaster risk reduction in the HKH, influenced through robust evidence from scientific research, gender responsive practices, and capacity building in the areas of river basins and cryosphere.		
Indicator	Means of verification	Assumption/risk
1 Number of policies and strategies using ICIMOD outputs related to integrative and inclusive water resource development and management, and equitable benefit sharing that leads to reduced physical vulnerabilities and reduced poverty.	<ul style="list-style-type: none"> • Programme review reports • Policy analysis • Media tracking reports • Progress reports • Evaluation reports • Annual review reports 	RMCs and development partners remain committed to integrated management of resources
2 Number of organisations effectively using and adopting innovative, gender sensitive, and context-specific water resource management practices at different scales using a water-energy-food nexus approach.	<ul style="list-style-type: none"> • Progress reports • Evaluation reports • Annual review reports • Media Tracking reports 	RMCs cooperate in sharing scientific data and information and remain committed to regional cooperation
3 Number of organizations from RMCs engaged in regional cooperation on cryosphere, climate services, and DRR contributing to reduced physical and social vulnerabilities.	<ul style="list-style-type: none"> • Progress reports • Evaluation reports • Annual review reports • Media tracking reports 	RMC organizations accept the water, energy, food nexus approach and are interested to adopt knowledge on water resource management techniques at different scales
4 Number of selected RMCs with substantial amounts of cryosphere in their territory having long-term and scientifically-robust monitoring programmes on these resources.	<ul style="list-style-type: none"> • Project reports • Progress reports • Evaluation Reports • Annual review reports • Media tracking reports 	
Initiatives	Focus Areas	
Water, Climate Change and resilience in transboundary rivers	To create climate, land-use, socioeconomic, and policy scenarios for water resources availability, use, and adaptation, linking “source to sea” in four glaciated river basins of the HKH.	
Cryosphere	To improve knowledge and understanding of cryospheric change and related processes and their relationship to water resources. And to build capacity of the RMCs in cryosphere monitoring to support better impact assessment and water and hazard management.	

Initiatives	Focus Areas
Indus Basin	To build resilience to climate change impacts through improved understanding of climate change, cryosphere, and water resources, and strengthening of networks for developing water management solutions.
Koshi Basin	To contribute to inclusive poverty reduction and enhanced resilience to climate change in the Koshi basin through supporting evidenced-based decision making and promoting regional cooperation.

5.4 Atmosphere

The HKH is vulnerable to increasing air pollution and climate change. It has experienced a rapid increase in air pollution in recent decades, with far-reaching and hazardous consequences on environmental and human health. In many places, both urban and rural, pollutants have reached alarming levels, threatening the health of millions of people in the region, particularly women, children, and the elderly; in each of these groups, the poor are the most vulnerable.

The socioeconomic impact of this slow-motion disaster on environment, human health and society is immense. The largest sources of air pollution in the HKH are solid waste, household emissions from cook stoves, and open burning of agricultural residue. Forest fires, diesel engines, brick kilns, and fossil fuel based energy production also comprise a significant portion of air pollution. During much of the dry season a thick regional haze blankets the lower-elevations of the southern HKH and the Indo-Gangetic Plains (IGP). The haze affects regional climate, altering precipitation patterns, contributing to the formation of persistent winter fog, and reducing visibility and sunlight (which affects aviation, tourism, ecosystems and agricultural production). At higher elevations in the HKH, black carbon and other aerosols contribute to a temperature increase that is among the swiftest in the world, leading to rapid melting of the Himalayan cryosphere and resulting in consequent changes in downstream water availability.

In 2013 ICIMOD established the Atmosphere Initiative to increase scientific understanding of the HKH atmosphere and to seek mitigating solutions to air pollution challenges. ICIMOD identified major data gaps in this area and worked with the governments of Bhutan and Nepal to establish atmospheric observatories at five locations in Bhutan and seven in Nepal (ranging from 100 to 4900 masl). ICIMOD established an in-house modeling centre, hired PhD fellows, hosted a variety of training courses, and launched collaborative studies to gain a better understanding of emission sources, the physics and chemistry of urban air pollution, as well as the recent persistent winter fog across the IGP.

During MTAP-III, research by the Atmosphere Initiative and its partners has improved scientific understanding in a number of areas:

- Greater understanding of the contributions of different emission sources;
- The role played by the IGP in polluting the HKH;
- The pollution transport pathways from the IGP to the high mountains;
- The role played by short-lived climate pollutants such as black carbon, ozone and methane in affecting regional climate;
- The role of dust in cryospheric melting;
- The role of agricultural fire on air pollution peaks; and
- Improved understanding of the health impact of air pollution in the RMCs.

Nevertheless, despite these research gains, critical policy and action relevant research questions remain in a number of areas.

During MTAP-III, the Atmosphere Initiative worked on mitigation options to reduce emissions from cook stoves, brick kilns, and open burning. As the lead implementer of the Climate and Clean Air Coalition (CCAC)'s brick initiative for Asia, ICIMOD hosted trainings that reached 3,000 brick entrepreneurs and workers in Bangladesh, India, Nepal and Pakistan, while documenting clean brick production and policy harmonization for these countries. The 2015 earthquake in Nepal damaged 95 percent of the brick kilns in the Kathmandu Valley, creating an opportunity to partner with the private sector to rebuild more energy efficient, less polluting, and seismically safer kilns. Success in this venture attracted additional funds to replicate this work throughout the country. In MTAP-IV, replication of this work across the HKH will be explored.

In recent years China has demonstrated quick success in cleaning up air pollution in Beijing, while governments in India, Nepal and Bangladesh are increasingly serious about cleaning up the air in their capital cities and elsewhere. At the policy level, ICIMOD has provided substantial inputs to the Government of Nepal. Regionally and globally ICIMOD played an active role in the Male Declaration on Transboundary Air Pollution, and advised the or steering committees of the International Global Atmospheric Chemistry project (IGAC), the Clean Air Asia City Certification Programme, the Asia Pacific Clean Air Partnership (APCAP), the Asia Co-Benefits Partnership, and the Climate and Clean Air Coalition (CCAC).

During MTAP-III, Atmosphere has placed much focus on knowledge generation on air quality and air pollution in the HKH. This fundamental work will continue in MTAP-IV in addition to increasing our role as a regional platform for discussions and actions on atmospheric processes and climate change, air pollution emissions, and facilitating active mitigation of these processes. Through ICIMOD's ongoing and forthcoming collaborative work with RMC partners, policies, strategies and actions will gradually lead to an improvement of air quality in the region for the benefit of environment, society and human health.

Rationale for the programme

The World Health Organization (WHO) estimates that 10,000 people annually face premature death due to outdoor air pollution in Nepal, and an additional 22,000 due to indoor air pollution (i.e., ~8,900 more people than those who perished in the April 2015 earthquake). In the Kathmandu Valley, nine persons per day, or 18% of daily deaths, are due to air quality related health problems. In China, combined outdoor and indoor pollution result in 2.2 million deaths annually, and in India 1.1 million per year. This means that the slow-motion disaster of air pollution has become one of the most significant health challenges and mortality factors in the world.

Beyond human health, the environment is also experiencing the profound impacts of air pollution, manifested through melting snow and ice and its subsequent impact on water resources; impacts on crop production and agriculture; and impact on economic sectors such as aviation and tourism – all of which may have implications for local, national and regional economies.

While scientific knowledge about air pollution issues in the HKH has improved significantly in recent years, there are still some major scientific unknowns and uncertainties in the field, including the extent and ways that air pollution impacts monsoon circulation, and the melting of snow, ice and permafrost. We also seek greater understanding of the drivers responsible for recent increases in persisting IGP winter fog.

Since emissions of air pollutants infiltrate and influence a range of sectors and involve governments, private sector and the general public, reducing air pollution becomes a fairly challenging task. Challenges revolve around the three dimensions – science, policy and practice – with scientific knowledge needing to be gathered about emission sources and impacts in order to underpin communications and recommendations. Governments in turn need to build on this knowledge to also make sure that policies

and laws are in place and enforced. This is often a challenge, since enforcement may be slow or absent in many cases. In such situations, successful initiation of mitigation measures may work better using other channels, including building public awareness through active citizens networks and working with the private sector directly to develop functional business cases. In this way, we may achieve greater success to bring governments on board as progress is made. Low funding and priority given to environmental ministries and agencies in many RMCs, and low capacity to address this complex problem is another challenge.

Over time several new opportunities to address air pollution in the HKH have emerged. Air pollution is gradually attaining more media, public and governmental attention, especially in China, India, and Nepal. This has created a policy environment more conducive towards combating air pollution. Furthermore, there is now sufficient science on the environmental and human health consequences of air pollution to justify action in a number of areas, including how to mitigate urban air pollution.

Building on the success of the regional brick kiln work undertaken together with the Climate and Clean Air Coalition (CCAC) in India, Bangladesh, Pakistan and Nepal, a public-private partnership has been formed where public funding is paired with investments from private brick kiln owners for a concerted effort to reduce emissions from the brick sector in Nepal. Financial gains from reduced need for fossil fuels in the form of coal become a main driver of change here. Moreover, there is increasing recognition of the regional nature of air pollution problem, and the need for strong regional coordination, as well as recognition of ICIMOD's strong in-house scientific expertise and ICIMOD's regional mandate.

Outcome and outcome indicators

Outcome

- RMCs use science based knowledge on air quality, atmospheric processes and climate to shape policies and actions leading to air pollution mitigation for improved environment and human health.

Indicators

- Number of effective local, national and regional policies, processes, and strategies using inputs and analyses from the programme in the areas of air quality, and environmental and human health to foster air pollution mitigation.
- Number of instances showing global policy processes (UNFCCC, CCAC, IPCC) influenced by the programme.
- Evidence of effective regional collaborations on atmosphere, clean energy, or climate in the HKH.
- Number of women and men, and number of institutions in the RMCs, empowered effectively through capacity building to address air pollution.
- Number of initiatives launched by governments, communities, and the private sector to take sustainable, gender-sensitive, and socially inclusive measures to improve air quality leading to reduced poverty and social vulnerabilities

Target beneficiaries and intermediaries

Beneficiaries

- The general public of the HKH who will benefit from improved air quality through reduced mortality and morbidity due to air pollution. In particular, the poor and the most vulnerable, including women, children and elderly will be the ultimate beneficiaries for the consequent improvements in the cryospheric health and sensitive ecosystems. Improved air quality will also benefit the overall economy of the region through improved agricultural production, increased mountain tourism, and improved transport reliability.

Intermediaries

- Government of the RMCs – local, national, and regional;
- Civil society groups;
- Research institutions working on atmospheric issues;
- Regional air quality scholars and graduate students;
- Private sector partners in industry and commerce;
- Media – print, radio, television, and internet-based; and
- Global and regional institutions.

Approaches and impact strategies

In MTAP-IV, Atmosphere will follow an impact pathway which starts with, and throughout is underpinned by, the need to acquire a fuller understanding about the atmosphere in the HKH, how it is changing, and its links with weather and climate. The HKH atmosphere is affected by global greenhouse gas (GHG) emissions, as well as regional emissions of short lived climate pollutants (SLCP) such as black carbon (BC) and other aerosols.

ICIMOD intends to work closely with partners in the RMCs to advance knowledge about the complex climate-atmosphere interlinkages in the region, and their impacts on nature and society. Such collaborative work will lead to improved knowledge among RMC stakeholders, which will form the basis for communication and outreach to the general public, and policy and decision makers. It will also form an integrative part of strengthened cooperation on multilateral and regional projects, trainings, and programmes. Overall, the gradually improved knowledge on climate and atmosphere in the region will strengthen ICIMOD and its partners and enable them to deliver larger impact on global policy processes, such as the international discourses linked to UNFCCC, the CCA, and the implementation of SDGs and the Paris Agreement.

Building on the fundamental importance of a sound understanding of the changes to the atmosphere, the climate, and air quality in the HKH, ICIMOD's Atmosphere programme will focus on the three sequential areas to address air pollution: emissions, impacts and mitigation.

Emissions

ICIMOD will work with partners to quantify emission sources, assessing their time-varying relative contributions to total emissions as well as their contributions to air pollution in different times and places. While the scientific literature – including contributions by ICIMOD and its MTAP-III partners – provides a good starting point to understand emission factors (e.g., the amount of emissions of different substances per amount of fuel burned), there are still many emission sources in the HKH that are poorly characterized due to lacking field measurements. To this end, there is a need to quantify how much fuel gets burned where and when, and to better understand the socioeconomic drivers that determine why and when polluting activities take place. Local and national governments, private sector, communities and the general public in the RMC's will be engaged in this work.

Traditional cook stoves are a significant source of air pollution leading to severe health impacts in the HKH. These stoves are inefficient and harmful, especially when utilized in areas with poor ventilation. ICIMOD will continue research on the barriers to sustained adoption of clean cooking practices, which will require a comprehensive understanding of the cultural, socioeconomic, and behavioral contexts of the areas where a change for the better is being promoted. ICIMOD will continue research on indoor and outdoor air pollution and on household/institutional cooking energy, which will be useful for policy makers, development partners, civil society organizations, and other relevant stakeholders in the energy sector for selecting the right mitigation options, such as improved ventilation and increased use of liquid propane gas. This work will need to include gender and social perspectives, since women and children are much more exposed to household pollution than the general working male population.

One important, and increasing, emission source in the region is diesel engines, either mounted in vehicles or as stationary diesel engines used for generating electricity or pumping of water for irrigation. During MTAP-III, ICIMOD piloted studies on motorcycle emissions in Kathmandu to improve our understanding of the emissions from heavy vehicles such as buses and trucks. Preliminary results show that the vast majority of emissions comes from a very small percentage of the motorbike fleet in the Kathmandu Valley, and these emissions could be drastically reduced by simple and affordable engine servicing. This kind of insight is key for policy and decision makers when it comes to drafting and supporting regulations for motor vehicles. ICIMOD will continue to collect this kind of data for the benefit of policy and decision makers to support the design of future mitigation measures.

Furthermore, open burning of agricultural residue and solid waste is seasonally one of the largest contributors of aerosols and other air pollutants. These practices include both the burning of small piles of residue at the sides of terraces as well as the large scale burning of entire fields – a practice that has grown rapidly in parts of the IGP. Even though each of these fires is nominally in size, the sheer number of them across the Gangetic plain make them a major source of pollution. Data from air quality monitoring stations installed by ICIMOD in Nepal show that places in the rural terai lowland occasionally have higher air pollution levels than Kathmandu. These types of fires, which usually brief, escape detection through remote sensing and thus have are underestimated and not well quantified.

During the dry months, forest fires contribute significant emissions in the HKH. Some forest fires take place at high altitude, close to the cryosphere, and may have a larger impact on the cryosphere than further-away sources of black carbon. A significant portion of fires in the HKH are set by people, either deliberately or accidentally, losing valuable resources while also increasing harmful air pollutants to the atmosphere. For these reasons, Atmosphere will work with other programmes at ICIMOD, such as REDD+ to build capacity in forest fire prevention and fire-fighting.

Impact

While we can improve our data collection about the amount and quality of air pollution in the HKH, understanding the impacts of this pollution constitutes a separate focus area. Atmospheric processes are connectors between emissions sources and places where air pollution has impact. These processes range from up-slope winds and dynamics that transport pollutants from the IGP deep into Himalayan valleys, to photochemistry that produces tropospheric ozone – a highly reactive gas with strong health and agricultural impacts, and to the microphysical processes taking place inside clouds. Atmospheric models can simulate the cumulative effect of these processes across a landscape. Further expansion of ICIMOD's modeling work, and further capacity building of our partners' abilities to run atmospheric models will be needed. Model validation requires in-situ observations, as provided by the observatories established in MTAP-III, and analysis of satellite data.

Building on the work to quantify emission sources, ICIMOD will facilitate improving knowledge about the impacts of air pollution on the environment, and human health and wellbeing. The effects of aerosols on the cryosphere (particularly black carbon and dust), is one area of study that of particular interest to the region and the global science community. Atmosphere will facilitate cross-disciplinary studies of this kind, building on ICIMOD's achievements in MTAP-III.

The impact of air pollution on human health has garnered more attention in recent years, driven by WHO's Global Burden of Disease estimates that place it among the top causes for deaths in the world. Recent alarming reports on poor air quality in urban and rural areas in the RMC's highlight the urgency of improved understanding of air pollution impacts on human health. Here, ICIMOD will work with WHO and the health sector to generate fresh insights into the magnitude of the problem and to raise awareness. Impact studies will also include socioeconomic impacts to the aviation industry from increased winter fog, to mountain tourism from visibility loss due to excessive aerosol haze, and to society from the costs of deteriorating human health.

Mitigation

Air pollution mitigation builds upon the previous two focus areas, using our understanding of emissions and impacts to suggest effective mitigation strategies and actions. ICIMOD will work with governments, the private sector and the general public to find ways and means to mitigate air pollution by targeting emission sources. The work will focus on different sectors and geographical settings, including urban environments in RMC countries.

During MTAP-III intense work has been carried out in the Kathmandu Valley, Nepal, to improve understanding on the relative importance of different emission sources. This work is supported ICIMOD in collaboration with the Nepal government, and the public and private sectors to identify realistic measures that can be taken in the short and long term to reduce emissions and improve air quality in the valley. The programme also intends to work with planners and policymakers to design urban transportation systems that promote public and non-motorized transport, reduce congestion, and create healthier urban living spaces. Ecosystem services provided by green areas in the urban landscape may also contribute to improved human health and well-being. The lessons and experience drawn from the work in the Kathmandu Valley will form a base for increased and upscaled work on air pollution mitigation in the HKH.

For air pollution mitigation, Atmosphere will also place increased emphasis on collaboration with the private sector in developing business cases. During MTAP-IV, we will continue our work with the brick sector. Through simple technical improvements energy use in the form of coal, and subsequent reduction in emissions, can be reduced with up to 40%, while also improving the quality of the bricks produced. Thus it is a clear business case and a win-win situation where brick kilns reduce their production cost for energy supply and the air quality is improved, having a positive impact for environment and society. The task to reform the brick industry through reduced energy use, seeking alternative renewable energy sources, and reducing SLCP emissions. This work will continue and be upscaled in the region. To this end, ICIMOD intends to facilitate public-private partnerships to gain increased traction for positive change.

Some RMCs have attempted complete bans on open burning of agricultural residues and solid waste, sometimes with poor success. Instead, providing economic or social incentives to reduce open burning may provide a way forward. For example, using agricultural residues as green fertilizer could be encouraged. Regarding solid waste, primarily in urban areas, the hidden value in the waste (e.g., paper and plastic) could become the foundation for recycling these resources instead of burning them, while the potential of using crop residues for mulching or as alternative energy sources in brick kilns or biomass gas could gain momentum. Urban waste also contain a large portion of food residues, also suitable for biogas production. Although this field provide its own set of challenges to overcome, from social to cultural and technical, ICIMOD intends to explore alternative management options of these resources with its RMC partners.

Climate and air pollution mitigation is closely connected to energy use and sources. Several interventions from our programme will target fossil energy use such as coal for brick production, diesel and petrol for vehicles, and biofuel for cooking. Reduced fossil energy use will result in reduced emissions of both greenhouse gases as well as co-emitted shorter-lived pollutants. In parallel, alternative renewable energy sources will be explored and, if promising, piloted. In MTAP-IV, ICIMOD will explore ways of engaging this sector from an air quality point of view, where ICIMOD's experience in setting up air quality monitoring and modelling the impacts of these sources may provide a sound platform for future work in this field.

Finally, capacity building in various forms will be an inherent part of Atmosphere's work. It may take the shape of regular workshops, trainings and courses, and include the continuation of the successful PhD fellows programme. One important part of the capacity building in the RMCs is to gradually hand over the responsibility for the air quality monitoring networks to our partners. This should be the case for the networks in Nepal and Bhutan during MTAP-IV. We anticipate that stronger regional collaboration will take shape. To this end south-south collaboration may also contribute to strengthened institutions.

Cross-cutting issues addressed by the programme

In line with ICIMOD’s mission, addressing air pollution can have significant implications for alleviating poverty. Clean air also has a rights-based dimension since clean air is a public common good. However, this right is currently being compromised due to human-induced pollution. Furthermore, this pollution does not affect all members of the public equally: the poor suffer more since they generally occupy less favorable areas, particularly in the urban landscape where they more commonly live close to polluting roads and industry. Similarly, women, children and elderly suffer disproportionately from poor air quality since they belong to the more vulnerable part of a community. Women and children are particularly vulnerable because they are more commonly in charge of household chores such as cooking and the open burning of solid waste and residues around the homestead. Elderly may be more vulnerable due to deteriorating health from old age, in such cases where air pollution exposure can be the ultimate cause of severe illness or death when added to other health factors. Thus, addressing air pollution through mitigation measures will benefit the poor, women, children in particular ways.

ICIMOD’s work in the brick sector also has a strong social dimension since this work intends to look into brick kiln working conditions in conjunction with the technical improvements for a holistic approach. Through modification and mechanization of the sector, the drudgery of labors will be lessened. To this end, women, again, are more vulnerable as workers in a demanding environment. Atmosphere will work closely with ICIMOD’s Livelihood theme and collaborate with relevant organizations to address working conditions in general (e.g., child labor, bonded labor and animal welfare) in brick kilns.

Atmosphere will also apply environmental economics as a cross-cutting dimension to its work in order to highlight the cost to the society that poor air quality brings in the form of negative impact on the environment and human health. Economic tools will also be used in order to explain the gains that will be made through the reduction of fossil based energy and/or changing to clean energy sources, and the subsequent emission reductions that will follow.

A final cross-cutting dimension of our work will raise awareness about the signs of corruption. It is possible that individuals and private sector actors find ways around emission standards (e.g., industrial or vehicular). This cross-cutting dimension is of very high importance since any improvements in air quality can be effectively undermined by negligence of agreed-upon standards and practices. Thus, despite many challenges linked to this field of inquiry, ICIMOD will consider the potential for corruption whenever implementing its programmatic activities.

Results framework

Outcome: RMCs use science-based knowledge on air quality, atmospheric processes and climate to shape policies and actions leading to air pollution mitigation for improved environmental and human health.		
Indicator	Means of verification	Assumption/Risk
1 Number of effective local, national and regional policies, processes, and strategies using inputs and analyses from the programme in the areas of air quality, and environmental and human health to foster air pollution mitigation.	<ul style="list-style-type: none"> • Annual reports • Review and evaluation reports • Citations, correspondence, media reports 	<ul style="list-style-type: none"> • RMCs and private sector give importance to climate and air pollution mitigation. • RMCs and the private sector allocate human and financial resources to mitigate climatic and air pollution.

Indicator	Means of verification	Assumption/Risk
2 Number of instances showing global policy processes (UNFCCC, CCAC, IPCC) influenced by the programme.	<ul style="list-style-type: none"> • Annual reports • Review and evaluation Reports • Citations, correspondence, media reports 	<ul style="list-style-type: none"> • RMC governments are willing to make evidence-based decisions. • Partners in the RMCs value cross-border collaboration on air pollution and climate. • Partners are gender sensitive and socially inclusive, or willing to become so.
3 Evidence of effective regional collaborations on atmosphere, clean energy, or climate in the HKH.	<ul style="list-style-type: none"> • Annual reports • Review and evaluation reports • Citations, correspondence, media reports 	
4 Number of women and men, and number of institutions in the RMCs, empowered effectively through capacity building to address air pollution.	<ul style="list-style-type: none"> • Annual Reports • Review and evaluation reports • Survey reports 	
5 Number of initiatives launched by governments, communities, and the private sector to take sustainable, gender-sensitive, and socially inclusive measures to improve air quality leading to reduced poverty and social vulnerabilities	<ul style="list-style-type: none"> • Annual reports • Review and evaluation reports • Periodic survey reports 	
Initiatives	Focus Areas	
Atmospheric Processes and Change	To improve understanding of changes to the atmosphere and climate as a result of anthropogenic emissions, and their impact on environment and human health.	
Air Pollution and Climate Mitigation	To facilitate interventions leading to emission reductions and subsequent mitigation of air pollution and climate change.	

5.5 Mountain Environment Regional Information System (MENRIS)

The synergistic convergence of geospatial technologies with mainstream information technology in the past few years has resulted in many applications that have influenced the lives of common people. There has been widespread penetration of smart mobile devices even in rural areas and many applications integrate location-based information. Agriculture advisory services, weather information, and navigation services are just a few examples that seamlessly integrate various spatial and non-spatial information to generate desired services for users. Similarly, there has been exponential growth in Earth observation (EO) applications with LandSat from National Aeronautics and Space Administration (NASA) and Sentinel satellite data from European Space Agency (ESA). Both systems are freely accessible while commercial satellite companies are providing opportunities to capture multi-source high spatial and temporal satellite images from any part of the Earth. The easy access to EO information has made it possible for scientific and consistent monitoring of different phenomena like never before.

In MTAP-III, ICIMOD strengthened its role as a regional information resource centre to address the dearth of consistent, comparable, reliable, and timely data and information for regional planning and policy development in the region. The Mountain Environment Regional Information System (MENRIS) programme focused on developing information and knowledge on key regional priorities and promoting active regional cooperation among RMCs to support informed decision making.

The implementation of two initiatives – SERVIR and Regional Database Systems (RDS) – within the MENRIS Programme has helped ICIMOD build its capacities in adopting many new technologies and

contextualizing them to the needs in the region. Many applications on the thematic areas of agriculture monitoring and food security, disaster risk reduction, ecosystem services, land use and land cover mapping, and climate services were initiated with greater emphasis on user engagement and stakeholder involvement in the design and development process.

Through RDS, ICIMOD created a data sharing policy and a platform for data management and sharing. All the initiatives within ICIMOD are actively participating to populate their data and share through the RDS. In collaboration with other regional programmes, numerous data sets at the national and regional scales have been developed to fill data gaps in the region. Studies on glacier dynamics and decadal land cover change are some good examples of Earth observation applications which have helped facilitate better understanding environmental processes in the HKH.

During MTAP-III, ICIMOD initiated many new applications taking advantages of the evolving technologies and information resources. Methodologies on agriculture and drought monitoring have been developed integrating the satellite data with climate data. Through its linkages with NASA and other international collaborators, applications integrating hydrological with weather and climate modeling have been initiated to generate climate services at different scales. New approaches on ecosystem services modeling and assessment have been applied to develop tools for forest ecosystem vulnerability assessment and adaptation strategies. Other areas of EO applications include systems for monitoring forest fires, air quality and snow cover.

MENRIS aims to continue working for environmental management and resilience to climate change and to initiate new activities in areas that represent institutional priorities in MTAP IV, such as access to clean energy. MENRIS will support this work through generation and management of databases, and development of customized information systems and climate services using EO and geospatial technologies targeted to the needs at local, sub-national and national levels. The programme will operationalize and leverage the use of information products, climate services, and data sharing platforms with a strong focus on user engagement and capacity building of individuals and institutions to foster collaboration and networking with key global and regional partners.

Rationale for the programme

Despite ICIMOD's progress to address environmental issues over the past 30 years, using new methods and tools, the scale of environmental problems in the HKH remains a consistent challenge. There is still demand for more reliable and timely information to support decisions and policy making for improved environmental and societal conditions. Current developments in EO, such as advanced modelling tools and high computing facilities, have improved the lag time and reliability of information in the monitoring and prediction of climatic variables. However, high variability of mountain topography creates micro climates and environments which need higher resolution data and processing. Many applications which generate highly accurate results in the plains are not able to generate similar results in the mountains. Small farm sizes, crop diversity, and seasonal variations are major challenges for agricultural monitoring and yield estimation. Anthropogenic pressures and vulnerability to climate change in HKH ecosystems is less well understood and there is a lack of consistent regional land cover change monitoring in the region. Similarly, cryosphere and hydrological applications suffer from limited hydro-met stations throughout the region and lack of data sharing, which are crucial for calibration and validation of this data. These conditions create challenges in developing early warning systems and applications for disaster risk reduction. Addressing the user needs and producing and delivering climate and DRR information in a timely and usable format is the most important part of the success of such services. It is critical to making linkages between production and supply of climate information with the demand and needs of users to ensure that the information is contextual, credible, trusted, understood and used by the users.

However, the technology trends and developments in the global geospatial community are encouraging. While a large amount of satellite data are now freely available, the emergence of cloud-based platforms for high volume storage and distribution, and scalable analytics have greatly enabled the research community to develop applications that can benefit from the availability of big data to understand the past and predict future trends. These developments have initiated a paradigm shift in the field of image data analysis and use. Easy access to low cost unmanned aerial vehicle (UAVs), and emerging crowd sourcing and citizen science have generated new opportunities for filling data gaps while web GIS and mobile applications have made it possible to harvest data and information from diverse sources and to deliver this information to users through interactive interfaces. Information dissemination through social media has made it possible to reach out to targeted masses more efficiently and effectively. These innovations in technologies and approaches provide new opportunities for ICIMOD to adopt more effective and efficient ways in designing and implementing solutions.

ICIMOD has been a participating member of the Group on Earth Observation (GEO) which works on a framework of coordinated strategies and investments to ensure complete coverage, availability, and compatibility of earth observation data across the globe. The Himalayan GEOSS has been included as community activity in GEOSS (Global Earth Observation System of Systems) work plans to foster collaboration among the regional member countries for promoting EO and geospatial applications in the region. Geospatial information and analysis is identified as a critical tool by the United Nations for monitoring and reporting on SDGs. Similarly, there are initiatives such as the Global Framework for Climate Services which also reinforce attention to regional and national needs to enable society to better manage risks and opportunities arising from climate variability and change through science-based climate information and prediction into planning, policy and practice. The World Meteorological Organization (WMO) considers the Global Framework for Climate Services as a major step forward in systematically providing climate information for decision making at various levels of climate-sensitive sectors. The Sendai Framework for Disaster Risk Reduction (2015-2030) emphasizes increasing the availability of and access to multi-hazard early warning systems and disaster risk information, and further recommends moving towards the approaches of multi-hazard environment and risk communication, risk-based warning, and forecast-based financing.

All these global initiatives call for international partnerships and collaborations. ICIMOD's regional and intergovernmental mandate provides good opportunity for positioning itself as a facilitator for regional cooperation and as a knowledge broker to address much-needed mountain focused research and development in the HKH.

Outcome and outcome indicators

Outcome

- Significantly contribute to effective evidence-based decision making processes by governments, communities and individuals using scientific data, Earth observation information, and geospatial technologies in the areas of agriculture, environment, natural resources, and climate change.

Indicators

- Number of institutions and programmes effectively using high-quality information services and climate services for gender-sensitive and inclusive decision making on natural and social systems at different levels (community, national, sub-national, and regional) leading to reduced poverty, vulnerabilities and improved ecosystem services.
- Number of women and men using ICIMOD's databases within and beyond the region through innovative platforms.
- Increased number of organisations and people (women and men) using earth observation and geospatial solutions as a result of capacity development.

- Effective mechanisms in place at national and regional levels that promote open access to scientific and geospatial data.
- Number of instances ICIMOD is recognized in global geospatial networks, forums, and exchanges.

Target beneficiaries and intermediaries

Beneficiaries

The ultimate beneficiaries are the women, men and children of the HKH and MENRIS will take different channels to reach them. MENRIS will engage with a range of stakeholders and support building linkages between beneficiaries, end users, and operational service providers. The data and information products will be used by the national agencies for purposes of policy making that will ultimately benefit the population at large in the RMCs. Some of our information and climate services will provide benefits directly at the local level, such as agro-advisory services for farming communities, flood early warning systems for households living in hazard-prone areas, and forest degradation and change assessments for community forestry user groups. We envision that our intermediaries will play a key role in helping MENRIS achieve appropriate design and deployment of future information systems.

Intermediaries

- Government ministries and departments in the RMCs; and
- Civil society groups working on relevant themes.

Approaches and impact strategies

Aligning with ICIMOD's Theory of Change and Impact Pathway approaches, MENRIS will develop its impact strategies to achieve the intended goals. The information products and services we develop will have impacts at different levels in the region. ICIMOD will contribute to enhancing capacities and strengthening regional information networking through the use of information services on key regional priorities. As part of our information services development, our work will improve the adoption of data collection standards and the harmonization of data and information for creating high quality regional databases in key thematic areas. These efforts will contribute to improved understanding of mountain ecosystems and change processes. Information thus generated will also support regional and global level assessments. At the national level, this work will enhance the capacity of national partners to exchange information, and provide access to information for improved decision making. Through the use of local level information services and dissemination mechanisms, our work will empower communities to be better prepared for disasters like drought and floods, agriculture planning, and resource management.

The strategies will include the following approaches and interventions, customized to the nature of the applications and services required for specifically targeted beneficiaries:

Stronger user engagement

The users of data and information services comprises a wide range including individuals, local communities, managers at sub-national and national level managers and policy makers, regional agencies, researchers and private sector. User engagement at different stages of planning and development will ensure effective and sustainable use of products and services. Dedicated staff specializing in partnerships and user engagement will be provisioned for developing strategies and designing activities for user engagement in a systematic and structured way. Consultations with key stakeholders will be carried out from inception to identify the problems and conceptualize potential solutions. Users will be engaged in the conceptualization stage of the products and services and regularly involved through meetings and consultation workshops during the development phase. The demand-driven approach will help maintain a balance between innovation and simplicity for user adoption.

Partnerships and co-development

While the user engagement will involve a wider range of stakeholders, partnership arrangements will be made with key government and line agencies for co-developing products and services. This work will help better integrate the requirements for operationalizing the systems and influencing the policies of these institutions to adopt the products and services in their decision making processes.

Capacity building

Capacity building strategies will be developed focusing both at individual and institutional levels for different target groups to equip them with the proper skills for using Earth observation and geospatial technologies and use products and services. Specialized training courses on different information systems will be designed and implemented with a special focus on the RMCs with relatively less capacity. Internships, exchange visits, and on-the-job trainings will be carried out for partner institutions. Partnerships will be established with selected universities to collaborate in organizing training programmes and formal academic courses on geospatial information science and technologies.

Gender mainstreaming

Gender mainstreaming will be given priority in the design of information products and services for gender disaggregated analytics wherever applicable. Female participation will be encouraged in all capacity building activities. Gender aspects will be considered in communication strategies and the development of information packages to ensure that women can benefit from services, especially those which are designed for community level applications.

Connecting global research and development to regional context

ICIMOD will further strengthen its collaboration with international universities and global research initiatives (e.g., NASA, USGS, JAXA, WMO) for collaborative research and knowledge generation. Applied research will be carried out for integrating data and information from diverse sources, analysis and modelling, and communication and visualization of information systems. The methodologies will be customized to regional and national needs, calibrated and validated in collaboration with national institutions for integration into products and services development. In collaboration with global leaders such as ESRI and Google, MENRIS will utilize emerging developments in EO and geospatial technologies such as hyperspectral, RADAR, and LIDAR remote sensing, cloud-based computing, artificial intelligence, data assimilation and modelling, and big data analysis in state of the art applications development. This will help to build ICIMOD's own capacities to assist its regional partners with enhanced know-how and services.

Piloting approaches and methodologies

MENRIS will facilitate common approaches and methodologies for the development of information services aligning with regional priorities. Approaches and methodologies will be developed and tested for selected sites, which can be later extended to national and regional levels. Emphasis will be on ensuring connection and compatibility with contemporary global and regional information systems.

Dissemination and up-scaling

Innovative information systems (e.g., near- and real time, crowd sourcing) will be designed for integrating data from national partners and communities for operational use. Special focus will be given to understand the target users' needs to customise the information products relevant to their context. Development of information products and services and dissemination will be promoted through appropriate channels such as web-based platforms and emerging virtual networking, including mobile devices where relevant in a strong coordination with the KMC team. The replications of information systems at the national and sub-national levels in the RMCs will be advocated for up-scaling.

Global and regional networking and policy influence

MENRIS will build and strengthen strategic alliances with global and regional initiatives (e.g., GEOSS, CEOS, GBIF, GCOS, WMO, WGMS) to maintain ICIMOD's position as a strategically important regional institution in the global fora and participate in relevant task forces to draw attention to the needs and concerns of the HKH. Such platforms will be used to advocate regional cooperation for promoting data sharing collaborative development among the institutions and within the region.

Cross-cutting issues addressed by the programme

MENRIS will focus on promoting the use of scientific data and information products and services to support decisions on various themes such as agricultural practices, natural resource management, ecosystem services monitoring, climate services, and disaster risk reduction and response. The applications of databases, EO, and geospatial technologies integrate multidisciplinary approaches that can be applied to many cross-cutting areas across the institution.

Gender

MENRIS will integrate gender aspects in its service planning in close collaboration with ICIMOD's gender team. Methodologies will be developed to generate and integrate gender disaggregated information for its applications. Capacity building strategies on geospatial technologies will consider gender as an important component in the implementation of programme activities.

Governance and transparency

Promoting the use of scientific data and information systems in decision making will support good governance in the RMCs. The use of different climate services and information products at sub-national and local levels will facilitate good governance at the community level. The unbiased assessment of natural resources derived from EO such as deforestation, carbon estimation, and agriculture production will help establish transparency at local and national levels.

Youth engagement

Geospatial information and science is a rapidly developing field where there is a need to attract the young people to build the required skill sets in the RMC populations. MENRIS has targeted youth through programmes such as hackathons, youth forums, challenge events and internships. MENRIS will continue youth activities through collaborations with universities and the Mountain Knowledge and Action Network programme for more systematic and sustainable youth involvement.

Private-sector engagement

The geospatial industry has been gaining economic and social relevance and maturity in recent decades: the worldwide value of the sector is now estimated to be more than USD 500 billion. The engagement of the private sector will be important for ICIMOD to build its own capacity and to maintain its position as a centre of excellence in the region. Partnerships with global leaders such as ESRI and Google will be strengthened while collaborations with regional and national private organizations will be developed through our Strategic Cooperation Unit.

Spatio-temporal monitoring and modelling

The primary strength of geospatial tools enable spatial and temporal context for analyzing and modelling various social and natural systems to explore past trends and patterns and to predict the future behaviour. Spatial technologies play major part in monitoring forests, snow, glaciers and water, and land use pattern. MENRIS will continue to work on various tools such as hydrological, water resources, and social and ecosystem modelling which will be carried out in close collaboration with other regional programmes at ICIMOD.

Climate services

MENRIS will work to develop operational climate services targeted to specific themes such as agriculture, disaster risk reduction, and tourism. These cross-cutting applications will be integrated with other initiatives at ICIMOD that focus on building the resilience of communities and developing livelihood options for the benefit of the larger end user communities.

Scientific data analysis and visualization

Scientific data analysis using big data and data cubes in cloud computing environments are emerging areas. MENRIS will work on developing tools and applications for regional data analysis and visualization of various biophysical and socioeconomical parameters for intuitive information communication and effective dissemination through web and mobile platforms.

Results Framework

Outcome: Significantly contribute to effective evidence-based decision making processes by governments, communities and individuals using scientific data, Earth observation information, and geospatial technologies in the areas of agriculture, environment, natural resources, and climate change.		
Outcome indicator	Means of verification	Assumption
1 Number of institutions and programmes effectively using high-quality information services and climate services for gender-sensitive and inclusive decision making on natural and social systems at different levels (community, national, sub-national, and regional) leading to reduced poverty, vulnerabilities and improved ecosystem services.	<ul style="list-style-type: none"> • Progress reports • Evaluation reports • Annual review reports 	The institutions are capable of and willing to partner for co-development and use of information services.
2 Number of women and men using ICIMOD's databases within and beyond the region through innovative platforms.	<ul style="list-style-type: none"> • Beneficiary tracking Survey reports • Progress reports • Evaluation reports • Annual review reports 	The available data is relevant and high quality.
3 Increased number of organisations and people (women and men) using earth observation and geospatial solutions as a result of capacity development.	<ul style="list-style-type: none"> • Tracer survey reports • Progress reports • Evaluation reports 	Training participants to learn the tools effectively and to be retained in relevant job assignments.
4 Effective mechanisms in place at national and regional levels that promote open access to scientific and geospatial data.	<ul style="list-style-type: none"> • Progress reports • Evaluation reports • Annual review reports 	Partners are willing to share data and maintain open data portals.
5 Number of instances ICIMOD is recognized in global geospatial networks, forums, and exchanges.	<ul style="list-style-type: none"> • Media tracking reports • Evaluation reports • Annual review reports 	Global forums recognise HKH needs.
Initiatives	Focus Areas	
SERVIR Himalaya	The SERVIR HKH initiative is a continuation from MTAP-III which emphasizes promoting applications of Earth observation and geospatial technologies for supporting environmental and development decision making. Strong emphasis will be placed on user engagement, gender, and communications for demand driven services development.	

Initiatives	Focus Areas
Regional Database System	The Regional Database System focuses on developing mechanisms for scientific data management and sharing within and beyond the region. RDS will work to upscale its system as a regional platform where ICIMOD partners can participate in data sharing.
Climate Services and DRR	This new initiative will focus on information needs of the individuals and institutions for disaster risk reduction and build on emerging weather and climate modeling facilities and information dissemination platforms to develop climate services focused on disaster risk reduction.

5.6 Mountain Knowledge and Action Networks

Knowledge development, use, and networking have great significance for sustainable development in the HKH. Academia and researchers from the universities and institutions have a critical role to play in knowledge generation, the development of human capacities and contributions to science for mountain areas. Action-oriented networking is an efficient means for developing youth engagement in a broader sense, and ICIMOD intends to strengthen mountain knowledge use in this regard during MTAP-IV.

The role of knowledge and action networks in sustainable development has been recognized at regional and global levels, especially in the context of achieving the Sustainable Development Goals (SDGs). Universities have been mandated as key institutions for catalyzing science, technology, innovation, and action research with an aim to improve people’s well-being and provide evidence for policy making. Global platforms such as the Higher Education Sustainability Initiative and Sustainable Development Solution Network of the United Nations have effectively contributed to the deployment and activation of science and knowledge to address pressing environmental challenges and promoting regional and international cooperation.

During MTAP-III, a number of knowledge networking initiatives emerged across ICIMOD or in close partnership with the Centre. The Himalayan University Consortium (HUC) has increased its membership to 45, now with institutional relations in all eight RMCs. HUC strengthened its network through various initiatives in the form of grants, exchanges, scholarship programmes, support of mountain-specific curriculum development, and the promotion of collaborative actions among HUC members. HUC members have expressed an increasing interest in collaborative research and training, and some have taken initiative to form thematic work groups based on common interests. ICIMOD hosts the Secretariat of the HUC and intends to continue this role during MTAP-IV.

ICIMOD has integrated the South Asian Network for Development and Environmental Economics (SANDEE) into its roster of research and knowledge generation services. SANDEE brings together researchers and practitioners from south Asian countries in order to address the region’s environmental development challenges. For sixteen years, SANDEE has offered competitive research grants, intensive mentorship, training courses and workshops, and research publication support to hundreds of researchers who produce high quality research and peer-reviewed publications on the inter-linkages between economic development, poverty reduction, and environmental change. SANDEE also facilitates the interaction between researchers, policy makers, and practitioners through biannual research and training workshops.

The Hindu Kush Himalayan Monitoring and Assessment Programme (HIMAP), coordinated by ICIMOD, has engaged over 300 researchers, practitioners, experts, and policy makers to comprehensively assess the current state of knowledge in the HKH, and to increase the understanding of various drivers

of change and their impacts, address critical data gaps, and develop a set of action-oriented policy recommendations. HIMAP conducted its first comprehensive assessment of the HKH between 2013 and 2017, with the publication of the assessment report planned for the end of 2017 as the first of a series of monitoring and assessment reports. The assessment will address the social, economic, and environmental pillars of sustainable mountain development and serve as a basis for evidence-based decision making to safeguard the environment and advance people's well-being in the HKH. ICIMOD is committed to continue networking among researchers through HIMAP for periodic assessments and dissemination of results.

Under ICIMOD's KMC department, the Youth Engagement in Sustainable Development initiative has grown to more than five thousand members, most of whom are from the RMCs. During MTAP-III, the Asia-Pacific Youth Forum was held annually focusing on themes such as adaptation, green economy, mountain issues and sustainable actions, and climate resilient mountain livelihoods. ICIMOD has partnered with national, regional, and global institutions to promote youth engagement through e-conferences, Climate Cafes, knowledge sharing workshops, and the Earth Debate, as stand-alone activities or alongside important international events. In the meantime, ICIMOD programmes have offered skill and entrepreneurship development activities to young men and women the HKH to develop their abilities to promote the goals of sustainable development and improved livelihoods. As one example, we focus on advancing niche mountain products through value chain development. ICIMOD's Godavari Knowledge Park has worked to empower youth by teaching proven entrepreneurial skills. Likewise, ICIMOD has also endeavored to promote climate change and environmental awareness in basic education through interactive, field-based activities to encourage environment stewardship among school children and teachers.

Rationale for the programme

The Mountain Knowledge and Action Networks (MKAN) programme seeks to address four major challenges faced by knowledge institutions and networks in the HKH.

- Individual and institutional capacity for conducting research and training, especially those of regionally collaborative in scope, for many institutions remains uneven and particularly weak when we look across the RMCs. Research is often donor-driven rather than need-based. The number of peer-reviewed international publications by HKH research and higher education institutions remains modest. Linkages between evidence-producing research and policies and between academic communities and policy makers are only scheduled interactions and dialogue, rather than a built-in and systematic process.
- Higher education curricula in the HKH lack a mountain-specific focus, even at highly reputed institutions of the region. This lacuna has proven a major hindrance for universities to make more effective contributions to sustainable development of the mountain regions. As a result, graduates are not well-prepared with locally relevant competency and skills for success in national and regional job markets.
- Inequitable access to quality education, social mobility, and leadership opportunities persists across genders and sub-populations in the HKH. Too few women occupy positions at the executive level in knowledge institutions, large business, think-tank organizations, and policy-making bodies. Promoting successful women intellectuals, entrepreneurs, and community leaders has potential to inspire young women to seek their own advancement in this regard. Young people from the mountains, particularly those persons from socioeconomically disadvantaged backgrounds, continue to face multiple hurdles in accessing and materializing opportunities to improve their well-being.
- Concerted efforts to effectively engage industry and the private sector in higher education and youth in sustainable mountain development is lacking in the HKH. Most university curricula have been developed without close consultation with the private sector, and local potential employers are rarely engaged in dialogue with faculty, university administrators, and prospective graduates regarding

perceptions of and needs for employment competency. Many youth empowerment activities remain as mass mobilization campaigns without vested efforts to sustain the impact and drive of the initiative. Pilot school environment awareness and intervention programmes are largely donor-driven and often do not last longer than the project cycle unless endorsed by local authorities and national governments.

Considering these four challenges, ICIMOD had identified several opportunities present for substantive growth, strengthening of existing networks, and promoting increased recognition of higher education, research and assessment, and youth engagement to achieve the SDGs.

While SANDEE has established itself as a leading network of top-notch researchers in the HKH, HUC has also gained a significant momentum with increasingly felt ownership by its members. HIMAP has successfully developed network of researchers and policy makers with its first assessment report in 2017.

Best practices gleaned from ICIMOD's various initiatives and programmes share a common feature that optimizes their impact and sustainability: We work to create triple bottom line impact by aligning economic benefits with social and environmental benefits. Apart from the start-up nature of enterprises, both on-farm and off-farm, these ventures are also characterized by a complex relationships, hybrid financing arrangements, and a potential for upscaling. Likewise, governments of several RMCs have recognized the importance of entrepreneurship and youth as significant opportunities for the HKH.

At the same time, the HKH is experiencing rapid change, driven by forces and stressors such as climate change, disasters, economic growth, globalization, infrastructure development, migration, and urbanization. The interplay of these complex drivers is challenging to predict, but will have major consequences regionally as well as globally. Thus, there is a critical need to assess and monitor these drivers and their potential cost (and benefits) to the HKH environment and human well-being. Achieving food, water, energy, and livelihood security in the region will require exploring scenarios based on different predictive assumptions so that the scientific community from universities and institutions to policy-makers, the private sector, and local communities can align their efforts to produce optimal governance decisions to sustain the HKH – a global asset.

Mountain Knowledge and Action Networks draws on the strengths, momentum, and lessons taken from existing alliances, and promotes cross-fertilization among them, aiming for evidence-based policies and practical solutions to benefit upstream and downstream communities. MKAN also works to stay apprised of current trends and demands from the RMCs regarding youth needs, and prepares itself to respond timely and positively when opportunities arise for promoting youth engagement in sustainable development activities across the HKH.

Outcomes and outcome indicators

Outcome

- Enhanced capacity and collaboration among universities, research alliances, policy makers, and youth for sustainable development in the HKH and adjoining regions.

Indicators

- Increased number of universities employing high quality relevant curricula related to mountains and environmental economics influenced by the programme.
- Number of instances that collaborative research and gender inclusive training programmes are organized by network members with their own resources.
- Increased number and quality of peer-reviewed publications by network members.
- Number of HUC fellows both women and men demonstrating effective sustainable mountain development work following the completion of an HUC scholarship and leadership programme with priority to women.

- An effective regional platform that uses science-policy dialogues for regional cooperation leading to poverty reduction, improved ecosystem services and reduced vulnerabilities.
- Number of national and sub-national policies influenced by the programme that contributes to poverty reduction and reducing social vulnerabilities
- Number of instances where youth acquire new skills and leadership for promoting sustainable mountain development.

Target beneficiaries and intermediaries

Beneficiaries

- The primary beneficiaries of this regional programme include, but not only, individual and organization members of the knowledge and action networks (e.g., universities, research institutes, policy making bodies, and all the persons who constitute these organizations). Private sector employers and civil society groups will benefit from a more highly and appropriately educated pool of young men and women.

Intermediaries

- Universities, research institutes, think-tank organizations, and policy-making bodies in the RMCs;
- Women and men researchers, faculty members, knowledge management professionals, and students at all levels of education; and
- Employers in public sector, civil society, and the private sector.

Approaches and impact strategies

Mountain Knowledge and Action Networks will deliver impact through the following approaches:

Fostering regional collaborative mountain-focused research and training by generating cohorts of HUC fellows (e.g., researchers, government officials, and business leaders) who produce advanced mountain-specific studies, work effectively toward practical solutions for transboundary issues, and champion environmental leadership. A continued provision of small seed grants will facilitate thematic work groups among HUC members to convene and discuss common issues and interests, and to work toward collaborative research and training. Fellowships, scholarships, student and faculty exchange programmes, and a field school programme (HUC Academy) will be promoted to provide opportunities for students and faculty to benefit from expertise available in the region and beyond, especially for women and students from disadvantaged communities. ICIMOD's Mountain Chair will be awarded to distinguished scholars of the HUC to promote mountain-focused research. ICIMOD's PhD/Doctoral fellowships and internship programmes will be administered in coordination with the HUC Secretariat, providing learning and research opportunities for scholars and students in various programmes and initiatives.

ICIMOD will reserve special attention to promoting female leadership in higher education, through peer learning opportunities and mentorship. A lecture series focusing on mountain challenges and issues will be coordinated by the Secretariat, featuring leading experts from around the HKH to offer real-time interaction with students and faculty across multiple campuses in different countries. The Secretariat will also facilitate the development of mountain specific curricula by HUC members and continue to provide a platform for sharing knowledge resources on mountain-specific issues and topics (e.g., HIMAL-DOC). A member profile searchable database will be developed and made accessible through an HUC online portal catering to the Consortium's members and their faculty and students.

The Secretariat will facilitate action on several fronts:

- Promoting peer learning between public and private universities among the Consortium's members;
- Engaging industry/private sector in curriculum development for a more relevant higher education;
- Partnering with business management and public administration schools and colleges in raising environment awareness; and

- Promoting effective communication between potential employers and prospective graduates on employment competency skills.

Strengthening the capacity of environmental economists through competitive research grants that allows researchers to set their own agendas, and supporting research publications in peer-reviewed journals. During the MTAP-IV, SANDEE will continue to contribute to skill development in research and teaching environmental economics by offering mentoring from an international group of faculty advisers and training courses taught by world-renowned faculty. Knowledge dissemination and dialogue will be undertaken through a network of peers, publications, workshops for policy makers and practitioners and information dissemination via multiple media. SANDEE enables interaction between researchers and policy-makers by inviting the latter to bi-annual research and training workshops to engage with researchers.

We will further strengthen our network through increased interactions with policy-makers who are responsible for taking forward the INDCs and other climate change policies of national, provincial, and local governments in the region. SANDEE will encourage its grantees to undertake research directed at the challenges of implementing the Intended Nationally Determined Contribution (INDC)'s and other policies through special research calls. SANDEE will also explore the possibility of providing special training courses on environmental markets such as carbon markets and environmental regulation. These courses would be taught by international faculty to private-sector executives and regulators. SANDEE will also explore cooperation with Civil Service Academies on training modules on environmental economics and management.

SANDEE hopes to offer two fellowships per year to journalists interested in the environment to attend our workshops and courses so that they can improve their reporting on research related to the economics of climate change. This type of cultivation will promote more informed environmental reporting and leaders in environmental journalism. SANDEE also has specific strategies to increase the presence of women researchers, trainees, resource persons, and board members within its network. SANDEE will aim for more research that integrates gender issues with environmental issues.

While many SANDEE alumni remain engaged with SANDEE activities, a more active engagement will be promoted in the future via social media and institutional linkages. SANDEE has collaborated with many organizations in policy dialogue and workshops. These interactions will be increased during the MTAP-IV particularly to attract SANDEE alumni, now that many of these people occupy leadership positions in civil society and the private sector.

Engaging scientists, researchers, practitioners, and policy makers in a regularized system of comprehensive and thematic assessments and science-policy dialogues. During MTAP-IV, HIMAP will conduct several thematic assessments and its second comprehensive HKH assessment. Collectively, these assessments aim to:

- Establish the global significance of the HKH;
- Reduce scientific uncertainty on various issues;
- Lay out practical and up-to-date solutions;
- Offer new insights for development in this region of a changing world;
- Value and conserve existing ecosystems, cultures, societies, knowledge, and distinctive HKH solutions that are important to the rest of the world; and
- Influence policy processes with robust evidence for sustainable mountain development.

To achieve these aims, HIMAP will focus on the evidence-based policy outreach from the first assessment report, and involve a range of institutions and individuals from the region and outside. HIMAP will engage decision makers from across sectors and institutes with the 'HIMAP Summary for Decision Makers' to develop country-level recommendation set in a regional context. They will promote regional

deliberations and HKH Science-Policy Dialogues to define possibilities for enhanced collaboration based on HIMAP results and use these reports to engage with and influence INDC and National Adaptation Plans (NAPs).

During the MTAP-IV, HIMAP will conduct several thematic assessments and the second comprehensive assessment in collaboration with researchers, practitioners, experts, and policy-makers. Annual outlooks on climate change, cryosphere, adaptation and other relevant topics will be produced. HIMAP has developed a list of SDG-consistent HKH mountain priorities, and will periodically monitor the performance of achieving the SDGs at the HKH level and in the individual RMCs.

HIMAP intends to promote the use of HIMAP findings and HKH mountain priorities into national plans in the RMCs. By engaging with NDC- and NAP-related government agencies, they will encourage consideration of the HKH mountain priorities with national-level SDG implementation plans. HIMAP will also design and implement processes for monitoring and reporting progress on the HKH mountain priorities at five-year intervals (2019, 2024, 2029), including reportage on individual country performance and progress toward achieving the SDGs.

Engaging young women and men in entrepreneurship, skill and leadership development for sustainable mountain development. MKAN will provide a platform for networking and partnerships, bringing together a diverse group of enterprises, researchers, investors, policymakers, and members of civil society. We will work in close coordination with other ICMOD's programmes and initiatives to ensure that skill and entrepreneurship development in mountain-specific goods and services target youth in the non-formal sector, including young women and men across various socioeconomic strata and cultural backgrounds in upstream and downstream communities. Mountain youth will be engaged in creative livelihood-improving enterprises, based on a flexible combination of unique mountain products and non-land based activities such as responsible tourism. The programme aims to promote public-private-community partnerships by networking with various related ministries and departments in the RMCs. Future plans include building a network and schools to foster foster environmental and social stewardship in the next generation of youth.

Cross-cutting issues

MKAN will adopt holistic approaches to address the following cross-cutting issues in a systematic way:

Gender

Concerted and systematic efforts will be made to promote participation of young women and women professionals in the programme, particularly in capacity and leadership building through scholarships, fellowships, professorships, training courses, and exposure visits. MKAN will devote special priority to attracting and accepting women candidates and providing continuous mentorship for potential women leaders across in academia, policy making, and the private sector. The programme will promote integration of gender concepts, gender analysis, and gender-sensitive research methodologies in curriculum building and collaborative research activities. Detailed gender analyses will be conducted as part of thematic and comprehensive assessments, and thorough gender action plans will be devised for every initiative.

Capacity building

Capacity building forms the backbone of all initiatives of MKAN. Capacity building involves the provision of specialized training courses and fellowships for researchers, professionals, decision and policy-makers, and youth groups. Moreover, these capacity enhancing opportunities will not remain as one-time offers. Instead, extra effort will be made to maintain networks of peers, fellows, grant recipients, and trainees to track of the impact of these networks and provide feedback for productive follow-up trainings and

mentorship. MKAN will pay equal attention both capacity building for individuals and strengthening knowledge institutions across the HKH.

Knowledge sharing

MKAN will promote knowledge sharing for sustainable mountain development across institutions and networks in the HKH and the globe. A wide range of open access platforms will be provided to promote common use of knowledge generated in the region to address environmental challenges and to promote regional and international cooperation. Knowledge management will be promoted as the foundation of good management and leadership practice across networks.

Network and partnership building

Systematic efforts will be made to sustain and strengthen existing networks and create new networks wherever needed through scheduled activities, frequently updated member profile databases, and innovative social-media based outreach. MKAN will adopt a proactive partnership building approach that rests on the principles of common interests, equity, diversity, transparency, and shared leadership. Specialized courses on partnership and leadership building will be offered to network leaders and administrators through virtual and face-to-face interaction.

Private sector engagement

Concerted efforts will be made to engage industry and the private sector for sponsorship of and contributions to higher education, action research, and the promotion of youth entrepreneurship and leadership. Interactions and dialogue between academics, employers, policy makers, the media, and practitioners will be promoted across initiatives. Business executives will be engaged through revenue-generating training programmes on environmental markets.

Special efforts will be made to raise funds from the industry and the private sector, including diaspora communities, to support youth programmes and higher education directly relevant to local and national labour markets. The private sector will also be encouraged to initiate endowment chairs at universities and to provide competitive research opportunities, internships, start-up business funds, and placements for students and graduates working on sustainable mountain development.

Results framework

Outcome: Enhanced capacity and collaboration among universities, research alliances, policy makers, and youth for sustainable development in the HKH and adjoining regions.		
Indicator	Means of verification	Assumption/Risks
1 Increased number of universities employing high quality relevant curricula related to mountains and environmental economics influenced by the programme.	<ul style="list-style-type: none"> • Progress reports • Evaluation reports • Annual review reports 	HUC members and RMCs continue to own the programme and work collaboratively.
2 Number of instances that collaborative research and gender inclusive training programmes are organized by network members with their own resources	<ul style="list-style-type: none"> • Progress reports • Evaluation reports • Annual review reports 	
3 Increased number and quality of peer-reviewed publications by network members.	<ul style="list-style-type: none"> • Citation reports • M Progress reports • Evaluation reports • Annual review reports 	Network members and grantees remain committed.

Indicator	Means of verification	Assumption/Risks
<p>4 Number of HUC fellows both women and men demonstrating effective sustainable mountain development work following the completion of an HUC scholarship and leadership programme with priority to women.</p>	<ul style="list-style-type: none"> • Tracer Study reports • Progress reports • Evaluation reports • Annual review reports 	<p>Continuous funding from five to ten years so that the number of HUC fellows reaches a critical mass to ensure lasting impact.</p>
<p>5 An effective regional platform that uses science-policy dialogues for regional cooperation leading to poverty reduction, improved ecosystem services and reduced vulnerabilities.</p>	<ul style="list-style-type: none"> • Evaluation reports 	
<p>6 Number of national and sub-national policies influenced by the programme that contributes to poverty reduction and reducing social vulnerabilities</p>	<ul style="list-style-type: none"> • Annual review reports 	<p>Governments and policy makers take ownership and make buy-ins to the programmes.</p>
<p>7 Number of instances where youth acquire new skills and leadership for promoting sustainable mountain development.</p>	<ul style="list-style-type: none"> • Evaluation reports 	
Initiatives	Focus Areas	
SANDEE	<p>Strengthen the capacity of environmental economists through grants and mentoring at workshops and training courses, and strengthen linkages with the private and public sectors, for example, through revenue-raising courses for executives and regulators in environmental regulation and markets</p>	
HUC	<p>Foster regional collaborative mountain-focused research and training, generating cohorts of HUC fellows who will produce advanced mountain-specific studies, work effectively toward practical solutions for transboundary issues, and champion environmental leadership.</p>	
HIMAP	<p>Engage scientists, researchers, practitioners, and policy makers in a regularized system of comprehensive and thematic assessments and Science-Policy Dialogues.</p>	
Potential: Youth Engagement for SMD	<p>Engage young women and men in entrepreneurship, skill and leadership development for sustainable mountain development.</p>	

6. Aligning ICIMOD Regional Programme with RMC Priorities

6.1 Country Consultations – Background

To develop the MTAP-IV, ICIMOD set out to align itself with the interests and priorities of the eight Regional Member Countries (RMCs) of the Hindu Kush Himalaya (HKH).

Starting nearly a year ago, we began holding consultation sessions with each RMC, inviting representatives from their respective governments, ICIMOD partner organizations, and other relevant stakeholder groups to share their thoughts and reflections on ICIMOD's past and current work, and what they identified as challenges to be addressed in the future.

Given the rapidly changing development scenarios both at the regional and global contexts, these consultations were initiated to identify opportunities for ICIMOD interventions could have regional significance, to appraise the validity of on-going ICIMOD activities, and to ascertain the most appropriate levels of effective partnerships for the implementation of the MTAP-IV. The participatory consultation process with eight RMCs aims to enhance ownership by the regional member countries and further concretise the Centres' engagement in the member countries.

More specifically, the country consultations aimed to:

- Familiarize our stakeholders with ICIMOD's new strategic framework and enhance ownership of its regional programmes and priorities;
- Develop improved understanding of relevant national policies and programmes and their positioning in the emerging global context such as the UN SDGs and Paris Climate Change Agreement;
- Provide a platform to engage with existing and new partners and explore ideas to strengthen partnerships, including the private sector; and
- Determine areas for collaborative action of mutual and regional significance, and enhance systematic cooperation and closer interactions with national partners.

All of these consultations were organized in close collaboration with the ICIMOD's country nodal agency. The valuable inputs and insights were carefully screened through a 'regional lens' and consolidated priorities have been integrated in the ICIMOD's next Medium Term Action Plan MTAP-IV (2018-2022).

The following section provides country by country description of RMC priorities with relevant background provided for context. We also include details about each RMC's institutional arrangement and landscape, the key recommendations of each country consultation, and of the strategic priorities for each country in MTAP-IV.

6.2 Afghanistan

Background

Afghanistan, a country with a long and rich history, ethnically diverse population, by and large rugged mountainous terrain, and rich biodiversity, once again stands at the crossroads. Afghanistan occupies almost 1,000 km of Hindu Kush Himalayan range that extends southwesterly from northern Pakistan, descending in elevation into the low-lying semi-deserts of western and north-western Afghanistan. Afghanistan is an agriculture-based economy with an arid and semi-arid continental climate. Only a relatively small part of the land area, an estimated 12 percent is suitable for arable farming or

horticulture (irrigated and rain-fed). More than half of all irrigated arable land lies north of the main Hindu Kush range in the drainage systems of the Amu Darya River. Afghanistan's natural resources are being degraded rapidly – ongoing conflict, internal displacement, high rates of population growth, low levels of education, and poverty, leading to the disruption of many rural livelihoods, turning many people into environmental refugees and increasing population pressures in urban centers.

Despite these challenges, the Government of Afghanistan has developed an ambitious 'National Peace and Development Framework (2017-2021)' in order to transform Afghanistan from an aid dependent into a self-reliant country and to lay the foundation for a peaceful and prosperous future. Likewise, different sectoral policies and frameworks are in place such as NRM strategy, Sendai Disaster Management Framework implementation, and environmental law among others.

Institutional arrangement of ICIMOD in Afghanistan

The Government of Afghanistan is a founding member of ICIMOD, along with seven other regional member countries. It contributes core support to ICIMOD, and Ministry of Agriculture, Irrigation and Livestock (MAIL) is ICIMOD's nodal agency in Afghanistan. The incumbent Director General Directorate of Natural Resource Management formally represents the country in ICIMOD's Board of Governors.

At the request of MAIL, a country office was set up in February 2007 and has been granted semi-diplomatic status for direct operations in Afghanistan in June 2011 by the Ministry of Foreign Affairs. The office coordinates the ICIMOD's programme implementation in Afghanistan, fosters the coordination between ICIMOD and government and development partners on mountain related initiatives, and facilitates regional exchange on mountain issues among ICIMOD's partners in all eight RMCs.

Partnership landscape

In addition to the nodal agency, key partners of ICIMOD in Afghanistan include Afghanistan Meteorological Department (AMD), Afghanistan National Disaster Management Authority (ANDMA), Aga Khan Assistance for Habitats (formerly known as Focus Humanitarian Assistance), Aga Khan Foundation, Ministry of Energy and Water (MEW), National Environmental Protection Agency (NEPA), Wildlife Conservation Society (WCS), and the academic institutions Eshraq Institute of Higher Education, Kabul Polytechnic University, and Kabul University.

Afghanistan's national priorities

Afghanistan's development priorities are outlined in the 'National Peace and Development Framework (2017-2021)', aimed at reducing poverty; achieving tangible progress towards the SDGs; fostering investment in key sectors such as agriculture, education, and construction; enabling more women to participate in socioeconomic activities; and creating employment, especially for Afghanistan's young population. In addition, related ministries have also realigned their strategies and programmes to this framework. For example, MAIL has developed its own "Comprehensive Agriculture Development National Priority Programmes". The Natural Resource Management Directorate, the focal point of ICIMOD in Afghanistan, has developed the "National Natural Resources Management Strategy" to elaborate the national and sectoral priorities. In summary, key priorities and strategies of the Government of Afghanistan related to Sustainable Development Goals, the Paris Climate Agreement and the Sendai Framework for DRR include: poverty reduction; improving productivity of agriculture, livestock and horticulture to decrease imports; energy security and food security, water resources management for irrigation, energy and drinking; biodiversity conservation, including transboundary protected area management; community-based natural resources management, including forests, rangelands and water; Climate change mitigation and adaptation; Institutional development and capacity building; and Resilience of societies.

Key recommendations from the Afghanistan-ICIMOD country consultation

A country consultation, jointly organized by the Ministry of Agriculture, Irrigation and Livestock and ICIMOD was held on 27-28 February 2017 in Kathmandu, Nepal. Key recommended areas for ICIMOD's engagement in the MTAP-IV include:

- Disaster Risk Reduction and resilience building is one of the main priorities in Afghanistan. The country is highly vulnerable to the adverse effects of climate change but early warning systems, innovative and robust approaches for DRM, coordination between different involved agencies, and disaster preparedness needs improvements.
- Forests and Rangelands are degrading rapidly in Afghanistan. Action-research feeding into policy as well as sharing of best practices from other RMCs for forest/rangeland management. Inclusion of local communities (Kuchis) for rangeland and natural resources management is an important area for interventions.
- Livelihood enhancement and diversification through value chain approach for high-value mountain products and the evaluation of eco-tourism potential in the Wakhan corridor.
- Development of integrated information platform through a coordinated approach by bringing together key stakeholders to support informed decision makings in the field of agriculture management, flood early warning systems, hydro-met data sharing. Promote sharing and exchange data and information through a sound policy.
- Capacity building through regional and tailored ICIMOD trainings on GIS and a number of other technical issues for staff of ICIMOD's partner ministries in Afghanistan remains a priority.
- Scientific institutions in Afghanistan would benefit greatly from increased inclusion in ICIMOD research undertakings. This is especially relevant for students and young professional that often have only limited field experience or little exposure to international scientific exchange.
- ICIMOD's support in highlighting Afghanistan's mountain vulnerabilities on an international stage but also through backing proposals for climate financing under the 2030 Agenda with technical input vis-à-vis e.g. the Green Climate Fund (GCF) would be a meaningful contribution. In addition, ICIMOD needs to interface with other development partners in close coordination with MAIL for synergistic programme development and complementary resource mobilization.

Regional programme: key actions for the MTAP-IV

ICIMOD is committed to expand its engagement with the Government of Afghanistan in the next MTAP. Key areas for collaborations in MTAP-IV will relate to livelihood enhancements, information services, climate change resilience, river basins and disaster risk reduction and preparedness and capacity building in above areas. A summary of engagement by regional programmes are outlined below:

ICIMOD will intensify its engagement and work Hindu Kush, Pamir, and Karakorum Landscape programme. This engagement will include work on forest and rangeland resource assessment for livelihood enhancement of marginalized communities e.g. Khuchis

- Expansion of Upper Indus Basin (UIB) Network and develop Indus flood outlook
- Community based early warning system and geo-hazard mapping and assessment
- Capacity building activities in cryosphere monitoring and assessment
- Capacity building on geospatial technology and applications to the MAIL and relevant stakeholders
- Technical support and assistance for the development of national geospatial portal building upon national initiatives such as NAIMS, NDIMS and others
- Operational geospatial information services on agriculture/irrigation; hydromet services; cryosphere; disasters
- Expand the membership to universities in mountainous areas; provide opportunities to faculty members, researchers and students, especially women and of socioeconomic disadvantaged background, for exposure visit, short training courses, PhD fellowship, and capacity building.

6.3 Bangladesh

Background

The main geographic area of engagement for ICIMOD in Bangladesh is the Chittagong Hill Tracts (CHT), an ethnically, culturally, and topographically diverse area with a population of approximately 1.6 million, including 11 small ethnic communities with distinct tribal cultures and traditions. The CHT remained alienated from mainstream development for close to two decades as a result of socio-political tensions and an insurgency, and remains physically and socioeconomically marginalized. In spite of considerable development efforts after the signing of the Peace Accord in 1997, the CHT remains economically one of the least advanced regions of Bangladesh. The area is predominantly rural, settlements are scattered, and the majority of the population lives far from roads and markets and relies on subsistence farming to meet its daily needs. Landholdings are small and fragmented, with no or limited land titles, and the region lacks good healthcare, sanitation, education, banking, finance, and transport facilities. Poverty remains widespread, human development is low, and food insecurity and vulnerability are high. The CHT is facing the brunt of climate change, and is suffering from water shortages and an increase in weather-related disasters. Increased environmental degradation, decreased land per capita, and low socioeconomic development have left people struggling to adapt to climatic and socioeconomic change and to improve their lives and livelihoods.

Institutional arrangement of ICIMOD in Bangladesh

Bangladesh is a founding member of ICIMOD, along with seven other member states. The Ministry of Chittagong Hill Tracts Affairs (MoCHTA) is the designated focal agency. The Secretary of MoCHTA represents the Government of Bangladesh in the ICIMOD Board of Governors. The Bangladesh-ICIMOD collaboration covers a broad range of activities ranging from – knowledge sharing to income generation, livelihood improvement, watershed management, disaster risk reduction, adaptation to climate change, space applications and hydro-meteorological monitoring, capacity building, and skills development in many sectors and regional cooperation. ICIMOD is working together with a range of implementing, policy, knowledge and network partners in Bangladesh.

Partnership landscape

In addition to the MoCHTA, some of the key partners of ICIMOD in Bangladesh include Arannayk Foundation, Bangladesh Agriculture Research Council (BARC), Bangladesh Centre for Advanced Studies (BCAS), Bangladesh Meteorological Department (BMD), Bangladesh Space Research and Remote Sensing Organization (SPARRSO), Bangladesh University of Engineering and Technology (BUET), Bangladesh Water Development Board (BWDB), Center for Environmental and Geographic Information Services (CEGIS), Centre on Integrated Rural Development for Asia the Pacific (CIRDAP), Ethnic Community Development Organization (Eco Development), Institute of Water Modelling (IWM), Ministry of Environment and Forests (MoEF), Ministry of Water Resources (MoWR), Parbattya Jumia Rehabilitation and Environmental Conservation (PAJURECO), Refugee and Migratory Movements Research Unit (RMMRU), Soil Resource Development Institute (SRDI), University of Chittagong and University of Dhaka.

Bangladesh's national priorities

With a strong economic performance, and commendable achievements made towards fulfilling a number of the Millennium Development Goals (MDGs), the Government of Bangladesh is now committed to achieving the Sustainable Development Goals (SDGs) by 2030. The country is growing fast and aiming to further accelerate economic growth, reduce poverty and inequality, and become a middle-income country by 2021, while creating a more inclusive and equitable society through the inclusion of ethnic, religious, and cultural minorities into a national and social force.

The process of implementation of the SDGs has started and is now a key priority of the GoB. However, given the variation in levels of development across the country, it is imperative to localize the SDGs at a sub-national level in order to effectively address the development challenges in different regions especially, in the Chittagong Hill Tracts. Through collaborations between the Planning Commission and ICIMOD, a hill perspective has already been integrated into Bangladesh's 7th Five Year Plan. The SDGs with their special attention to equality, non-discrimination, inclusiveness and the pledges that 'no one will be left behind' and to 'reduce inequality within and among countries' provide a workable framework towards sustainable development for all. In this regard, the CHT deserves special attention but also clear focus and concerted actions towards the promotion of inclusive growth, and ensuring that the ethnic minorities are not left behind.

Bangladesh is one of the most vulnerable countries to the adverse impacts of climate change. In terms of climate change measures and low-carbon growth, Bangladesh has ratified the Paris Climate Agreement and has outlined its strategies in a number of policy documents: the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) in 2009, the Energy Efficiency and Conservation Master Plan 2030, and the Renewable Energy Policy 2008. Also recently launched sub-regional initiatives, the Bangladesh-China-India-Myanmar (BCIM) economic corridor and the Bangladesh, Bhutan, India, Nepal (BBIN) are fast changing with the prospects of connectivity and regional socioeconomic development.

Key recommendations from the Bangladesh-ICIMOD country consultation

On 4 December 2016, ICIMOD and MoCHTA organized a country consultation in Dhaka in order to align ICIMOD's work with Bangladesh's national priorities and to seek input for MTAP-IV from the wide network of ICIMOD partners in the country. Key recommendations are:

- Support the GOB's efforts on inclusive and sustainable development of the CHT aligning with the SDGs focusing on poverty reduction keeping gender and ethnic groups in centrality. Assist policy makers at all levels to design policies and regulations that specifically address the realities and challenges in the hills and help to localise the SDGs in the CHT. In addition, assist to develop CHT context specific indicators for sustainable development, and highlight approaches to address multidimensional poverty;
- Assist in sustainable, environmentally friendly agriculture and innovative livelihood opportunities in the CHT deriving from horticulture and high-value products through value chain development, market access and private sector engagement. Expand the work on destination management and sustainable tourism as an alternative livelihood approach in the CHT.
- Continue and expand the work on spring management, river basins, and on flood early warning systems, satellite based weather and flood forecasting, off-grid renewable energy solutions and expand joint research. In addition, it is important to further explore and establish the upstream and downstream linkages between Bangladesh related to issues like environment services, floods and flash floods etc.
- Build capacities for data collection, data management and analysis and support innovative use of technologies such as GIS/RS and making it available to policy makers and development practitioners;
- Support climate change adaptation and help build community resilience, improved climate modelling and monitoring in order to reduce unpredictability and influence policy. Provide climate services and enhance capacity of national partners.
- Support the Government of Bangladesh through knowledge sharing, capacity building of youth and empowering them for climate actions, and technical support to access emerging climate finance mechanisms such as the Green Climate Fund (GCF)
- Provide a regional platform for sharing of experiences of cross-border exchange on between a wide range of stakeholders, including policy makers, academia, civil society, NGOs, private sector could help to facilitate regional cooperation and sustainable economic development.

Regional programme: key actions for the MTAP-IV

ICIMOD is committed to support the Government of Bangladesh and to work together with the MoCHTA and other government and non-government partners in order to fulfil the ambitious national development agenda and the SDGs in the CHT and elsewhere in Bangladesh.

- Continue support in climate change adaptation and resilience building, and inclusive and responsible tourism with a focus on improving livelihoods of local communities; Value-chain development; knowledge sharing and capacity development.
- Initiation of Cherrapunji-Chittagong Landscape initiative if the situation is conducive for transboundary cooperation.
- Continue support in Regional flood information system, Climate modelling, vulnerability assessment
- Upscale brick kiln innovations for energy saving and emission reduction. Collaboration with the government on air quality monitoring.
- Capacity building on geospatial technology and applications to the relevant stakeholders
- Agricultural and drought monitoring using geospatial technology: Operationalize climate services
- Revive and sustain interest and ownership among higher education institutions in Bangladesh and specifically with relation to the CHT through HUC network.

6.4 Bhutan

Background

Bhutan is a mountainous country with a narrow strip of lowlands on its Southern border with India, the lesser Himalayas in the central region, and the Himalayas with massive peaks and spectacular valleys dominating the Northern border region to China. Bhutan is covered to approximately 71% by forest and endowed with rich natural resources of which especially hydropower resources account to large parts of the national revenues. Over the last decades, and especially since the introduction and adoption of Bhutan's unique development philosophy of Gross National Happiness (GNH) by the Fourth King, Bhutan has made significant progress in its development trajectory. Bhutan has achieved or surpassed targets of five of eight Millennium Development Goals (MDGs) including poverty reduction and environmental sustainability. Bhutan has recently developed significant hydropower with the access to energy services to more than 95% of its population. But similar to other countries in the region, further challenges related to poverty reduction, especially in rural and remote areas, employment creation in a largely agricultural rural economy, adaptation to anthropogenic and non-anthropogenic changes, and especially resilience to the adverse impacts of climate change remain. Increasingly frequent natural hazards and the risk of glacial lake outburst floods (GLOF) put considerable strain on the country, its people and environments, but also its regional downstream neighbours. In terms of future development, Bhutan is now fully committed to the global Sustainable Development Agenda 2030 and the SDGs. In fact, out of 143 relevant SDG targets, 134 targets are already fully embedded in Bhutan's current 11th Five Year Plan (2013-18).

Institutional arrangement of ICIMOD in Bhutan

The Royal Government of Bhutan is a founding member of ICIMOD, along with seven other member states. It contributes to ICIMOD's core support fund, and has its Ministry of Agriculture and Forests (MoAF) as the focal agency for ICIMOD. The incumbent Secretary of the MoAF formally represents Bhutan in the ICIMOD Board of Governors. ICIMOD has established a country desk at the Ministry with a support staff to meet growing needs for coordination. Formal letters of agreement for ICIMOD programmes are routed through and approved by the Gross National Happiness Commission (GNHC) in close coordination with the MoAF.

Partnership landscape

Along with the MoAF, key partners of ICIMOD in Bhutan include Gross National Happiness Commission (GNHC), Bhutan Centre for Environment and Development (BCED), Bhutan Chamber of Commerce and Industry (BCCI), Bhutan Media and Communications Institute (BMCI), Bhutan Trust Fund for Environmental Conservation, Center for Bhutan Studies, Council for Renewable Natural Resources Research, Department of Disaster Management (DDM), Department of Forests and Park Services, Department of Hydro-met Services (DHMS), Forest Resource Management Division, Ministry of Agriculture and Forests, Ministry of Economic Affairs, National Environment Commission (NEC), National Land Commission (NLC), National Statistical Bureau (NSB), Royal Society for the Protection of Nature (RSPN), Royal University of Bhutan (RUB), SAARC Forestry Centre, Taranayan Foundation, Ministry of Agriculture and Forests, Sherubtse College, Thimphu IT Park, and Ugyen Wangchuk Institute for Conservation and Environment (UWICE).

Bhutan's national priorities

Bhutan's 12th Five Year Plan (2018-23) with the objective of a "Just, Harmonious and Sustainable Society through Enhanced Decentralisation" is currently in the drafting process. Building on past development experiences and based on GNH, the Royal Government of Bhutan (RGoB) has decided to focus especially on the SDGs Goal 1 (Ending poverty in all its forms everywhere), Goal 13 (Take urgent action to combat climate change and its impacts), and Goal 15 (Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss) in the next Five Year Plan (FYP).

Key recommendations from the Bhutan-ICIMOD country consultation

Key recommendations from the Bhutan-ICIMOD country consultation, jointly held with MoAF on 20- 21 November 2016 in Thimphu include:

Bhutan aims continuously at improving the National Gross Happiness Framework, making it less top-down, and improving direct engagement and participation of local communities and mountain people. This opens up a number of possibilities for Bhutan and ICIMOD to collaborate. In addition, adopt and apply GNH to other RMCs in order to find a more holistic approach to development, and how to mainstream wellbeing of mountain people in the differing local and national contexts in the HKH region could be a joint project of ICIMOD and Bhutanese partners.

Due to climate change, Bhutan faces increasingly frequent and unpredictable hazards and disasters. Innovative approaches for disaster management through resilience building as well as mechanisms for emergency disaster response and recovery such as GLOF. Innovative approaches and action research for climate change adaptation, vulnerability assessments and climate services rural areas.

Research and piloting in irrigation and water storage to support the agricultural sector in Bhutan. Also, with the science support and incorporating upstream, downstream approach, ICIMOD can play a key role in improving river basin management. Likewise, ICIMOD can support the drafting of local water master plans, particularly in areas with water use and management by providing technical inputs.

Support mountain agriculture through effective piloting, high-value development e.g. products (like the support in introducing Kiwi cultivation in hill areas), and the development of market linkages with the active involvement of private sector. Small-scale rural energy production to provide rural employment and income generation for livelihood support. In this regard, innovative approaches for energy use to reduce poverty would be highly beneficial.

Long-term financial support from multilateral and international donors for protection and conservation in conjunction with the Bhutan Trust Fund for Environmental Conservation. Through its transboundary landscape programmes, ICIMOD could also initiate and steer on the ground activities that support conservation and development goals. Resource mobilization from international climate financing mechanisms such as GCF should be explored.

In terms of research and knowledge production and sharing, ICIMOD should continue to support the Royal University of Bhutan through joint research, academic exchange through the HUC network, and by aiding the development of regional centers of excellence for postgraduate education

Role of private sector is a key agent for economic growth and of employment creation. But more efforts are required to support micro and small enterprises (creation), entrepreneurship of mountain people and thus employment creation, especially for mountain youth. rural entrepreneurs, and regional sharing and exchange

Build technical capacities of government agencies in using GIS and RS for effective decision making. Provide technical support national GIS and geospatial portals in close collaboration with the Centre for GIS Coordination.

Regional programme: key actions for the MTAP-IV

In the MTAP-IV, ICIMOD will work together in the areas of combating climate change, enhancing the well-being of mountain people, and protecting invaluable ecosystem services that derive from mountains while at the same time adapting to anthropogenic and non-anthropogenic changes and enhancing the resilience of mountain people. A summary of engagement by regional programmes are outlined below:

- Livelihood opportunities and value-chain development; knowledge sharing and capacity development
- Resilience building and exploring solutions to diversify livelihood improvement opportunities
- Regional collaborative framework of Kanchenjunga Landscape involving Bhutan, India and Nepal for conservation and development related programme and activities
- Moving from REDD readiness phase to demonstration phase
- Regional flood information system and capacity building activities
- Cryosphere monitoring and regional collaboration
- Institutional capacity building and handing over responsibility of air quality monitoring to Bhutanese partners as well as support in emission reduction
- Capacity building on geospatial technology and applications to relevant stakeholders: Operational climate services
- Promote collaborative research and training among higher education institutions in Bhutan

6.5 China

Background

Geographically, the HKH region in China covers mountainous areas in the six provinces Gansu, Qinghai, Sichuan, the Tibetan Autonomous Region (TAR), Yunnan, and the Xinjiang Uyghur Autonomous Region. These vast areas are home to significant biodiversity hotspots, the sources of some of Asia's most important rivers, and are ethnically and culturally extremely rich and diverse. In addition, and despite geopolitical sensitivities, China's Southwestern and Northwestern provinces are increasingly becoming regional economic hubs. In terms of environmental protection and climate change, the Qinghai Tibetan Plateau and the adjacent mountain systems face increasingly problems caused by rapid glacier melt, extreme weather events and hazards, and land use and land cover change. Despite China's economic achievements, economic development in the mountain regions has not created the same levels of prosperity as in the coastal provinces and mountain people are lagging behind in a number

of development indicators. Thus, continued action to combat the adverse impacts of climate change, environmental protection and conservation, as well as inclusive socioeconomic initiatives are key to achieve sustainable development for mountain people and ecosystems in China.

Institutional arrangement of ICIMOD in China

The People's Republic of China is a founding member of ICIMOD, along with seven other member states. China has been a member of ICIMOD since its inception and providing core support to ICIMOD. The Chinese Academy of Sciences (CAS) is the designated nodal agency. The incumbent Vice President of CAS formally represents China in the ICIMOD Board of Governors. In 2006, the Chinese Academy of Sciences established the 'China Committee of ICIMOD (CN-ICIMOD)' as the national committee representing ICIMOD's network of collaborative partners in China. CN-ICIMOD's secretariat is housed at the Institute of Mountain Hazards and Environment, Chinese Academy of Sciences. In addition, two branch offices are located in the Kunming Institute of Botany (KIB), Chinese Academy of Sciences and Tibet Academy of Agriculture and Animal Husbandry Sciences (TAAAS) in Lhasa. CN-ICIMOD has developed into an effective platform for coordination and collaboration between ICIMOD and its Chinese partners.

Partnership landscape

In addition to the CAS, KIB and TAAAS, key partners of ICIMOD in China include Asian International Rivers Center Yunnan University (AIRC), Chengdu Institute of Biology (CIB), China Metrological Administration (CMA), Cold and Arid Regions Environmental and Engineering Research Institute (CAREERI), Institute for Global Environmental Strategies (IGES), Institute of Geographic Sciences and Natural Resources Research (IGSNRR), Institute of Mountain Hazards and Environment (IMHE), Institute of Tibetan Plateau Research (ITP), Lanzhou University, National Natural Science Foundation of China, Northwest University, Sichuan University, Southwest Forestry University, UNIDO International Solar Energy Center for Technology Promotion and Transfer, United Nations Office for Outer Space Affairs, University of Chinese Academy of Sciences, Xinjiang Institute of Ecology and Geography (XIEG), Yunnan Agriculture University, Yunnan Academy of Social Sciences (YASS), Yunnan Institute of Environmental Science (YIES), and Yunnan University.

China's national priorities

According to China's 13th Five Year Plan and several other key policy documents, the Qinghai-Tibetan plateau plays a key role as a national ecological barrier between upstream and downstream areas. Therefore, the Government of China will strengthen its efforts to restore and protect this unique mountain ecosystems and seek new strategies for sustainable mountain development. The Chinese government has ratified the Paris Climate Agreement and is committed to play a leading role in the global combat against climate change. With the 'One Belt, One Road' (OBOR), the Government of China has also underlined its committed to expand regional cooperation for connectivity, trade and prosperity. The Chinese Government considers ICIMOD as a key regional partner in various OBOR initiatives. There is also increasing interests in research and investments from the Chinese Government. In 2016, the Natural Science Foundation of China has a signed a MoU with ICIMOD to support research in the HKH region. Already 12 projects are underway in close cooperation with ICIMOD. There is also potential from newly established Asian Infrastructure Investments Bank in Beijing for investment projects. Also, emerging dynamics of private sector and Foundations need to be explored.

Key recommendations from the China-ICIMOD country consultation

On 24 August, ICIMOD together with the Chinese Academy of Sciences (CAS) and CN-ICIMOD, held a country consultation meeting in Beijing. Among the key areas for ICIMOD to focus during MTAP-IV are the following:

- With regard to regionalization, ICIMOD could take a stronger lead for exchange and learning between countries and help build regional networks. ICIMOD is well positioned to advance the knowledge on climate change through research and provide evidence based solutions to adapt to climate change. ICIMOD also play a proactive role in the global stage to raise mountain agenda and voices in future multilateral negotiations, reports (e.g. IPCC), and agreements.
- China and the other HKH countries face frequent and numerous disasters. But specialized disaster risk assessments with a strong focus on mountains still need to be improved. The studies of glaciers and glacier change should be expanded, especially with regards to the impacts of CC and to the future availability of water resources in the region. In addition, much more research on permafrost in the high altitude plains both within China but also the whole region is urgently needed.
- ICIMOD has made valuable contributions in the field of transboundary water management and especially in the complex upstream and downstream linkages. Benefit sharing and payment or incentives for ecosystem services is a priority. In particular, cross-boundary sediment catchment and hazard management (e.g. community based early warning systems to reduce transboundary glacial lake outburst floods, GLOF) are important topics.
- Stronger focus needs to be given on integrated approach by linking more explicitly social and natural sciences, and make a more explicit and internationally visible link between mountain development and the Sustainable Development Goals (SDG) in order to support the Chinese Government in drafting specific mountain policies.
- Most mountain people in the HKH rely heavily on agriculture. Work on high-value products (HVP), improve value chains, focus on market access and infrastructure as well as linkages with the private sector for wider benefits.
- Role of ICIMOD in OBOR initiatives highlighting mountain perspective and impacts on fragile environment. Highlighting options for mountain people to benefit economically from China's regional initiatives like CPEC and China-Myanmar-Bangladesh-India corridor. ICIMOD can also play a crucial role together with its Chinese partners to access and use OBOR funds for mountain research and sustainable mountain development.
- ICIMOD can play a role in leading mountain research in different fora within China and the region such as NSFC and others including potential with the private sector. NSFC has made available RMB 30 million for Chinese researchers for collaborations with ICIMOD.

Regional programme: key actions for the MTAP-IV

In the MTAP-IV, ICIMOD will work together in the areas of climate change, livelihoods, ecosystem, water resources, landscape management, DRR, biodiversity and many other aspects of regional cooperation. A summary of engagement by regional programmes are outlined below:

- Livelihood opportunities and value-chain development; knowledge sharing and capacity development
- UNESCO World Heritage Nomination to be initiated
- Promotion of regional cooperation, developing knowledge products on landscape linkages; Supporting National Park and Protected Area management; Transboundary tourism development ; Landscape management in Kailash, Far-Eastern Himalaya, and Hindu Kush-Karakoram-Pamir.
- Expansion of Upper Indus Basin (UIB) Network and develop Indus flood outlook
- Collaboration with Chinese partners for usability of data and End to End forecasting as well as enhanced partnership for improved end user interface
- Strengthening partnerships for increased regional collaboration in cryosphere monitoring.
- Increase trans-Himalayan technology transfer, and intensify collaboration with research institutions, government and private sector actors.
- Cooperate with Natural Science Foundation of China to support research in areas of ICIMOD interest.
- GEOSS Himalaya partnerships to promote and use earth observation mountain specific applications and regional collaboration
- Building on a solid network in China focus on to promote collaborative research and training with Chinese universities and institutions; tap on resources provided by Chinese higher education institutions and governments for sustainable mountain development in China and the HKH. Continue and expand Visiting Scholar Programme co-funded by Chinese universities and ICIMOD.

6.6 India

Background

The Indian Himalayan Region (IHR) covers a geographic area of over 5.3 Lakh km² in twelve Himalayan states, constituting to approximately 16 per cent of India's total land surface. An ethnically, linguistically, religiously, and culturally highly diverse population of around 40 million people (approximately 3 per cent of India's population) lives in this area. With many of India's great rivers like the Ganga, Yamuna and the Brahmaputra flowing from the Himalaya, the region functions as a water tower and provides water for drinking, irrigation, or hydro-power to large parts of the Indian subcontinent. The IHR is also very rich in terms of biodiversity with many flora and fauna species endemic to the region. In recent decades, the fragile and highly vulnerable Himalayan ecosystem faces more and more the adverse impacts of climate change, over-exploitation of natural resources, land cover change, urbanization, and negative externalities of increased economic activity. One of the major challenges thus is to reconcile development imperatives with conservation requirements for future sustainable development, and to reduce the risks stemming from increasingly frequent and disastrous natural hazards including floods, drought, landslides, and also potential glacial lake outburst floods (GLOFs).

Having recognized the specificities of the IHR, the Gol has established the National Mission on Sustaining the Himalayan Ecosystem (NMSHE) in 2014 as one of eight area-specific missions under the National Action Plan on Climate Change (NAPCC) with the aim to facilitate the formulation of appropriate mountain specific policies, to enhance the understanding of the impacts of climate change, and to develop new approaches to adaptation, resilience and sustainable socioeconomic development. Furthermore, the Gol is drafting a dedicated Mountain Specific Policy for the conservation of the IHR and the Western Ghats.

Institutional arrangement of ICIMOD in India

Along with seven other member countries of ICIMOD, India is a founding member of ICIMOD. India provides core support to ICIMOD since its inception. ICIMOD's nodal ministry in India is the Ministry of Environment, Forest and Climate Change (MoEF&CC). The GB Pant Institute of Himalayan Environment and Development (GBPIHED), under MoEF&CC, serves as the focal institution for the facilitation and coordination of ICIMOD's activities in India. The incumbent Secretary of the Ministry of Forest and Environment formally represents India on the ICIMOD Board of Governors.

Partnership landscape

ICIMOD coordinates and cooperates with various government agencies in all twelve Himalayan states and operates a wide network of strategic and policy partners, implementation partners, and knowledge partners including non-government organizations, academic and research institutes, local groups and civil society organizations, media and the private sector actors. Some of the key strategic partners of ICIMOD in India include Ministry of Environment, Forest and Climate Change (MoEF&CC), GB Pant Institute of Himalayan Environment and Development (GBPIHED), Bihar State Disaster Management Authority (BSDMA), DHI (India) Water and Environment Pvt Ltd, National Institute of Administrative Research, Lal Bahadur Shastri National Academy of Administration, and Reuters Market Light (RML). Other key partners include AN Sinha Institute of Social Studies (ANSISS), AARANYAK, Advanced Center for Water Resources Development and Management (ACWADAM), Central Himalayan Environment Association (CHEA), Centre for Ecology Development and Research, CSK Himachal Pradesh Agricultural University, Forest Research Institute, Greentech Knowledge Solutions Private Limited, Himalayan Action Research Centre (HARC), HNB Garhwal University, Indian Council of Forestry Research and Education, Indian Institute of Technology (IIT), Institute For Financial Management and Research (IFMR), Institute for Himalayan Environment Research and Education (INHERE), Institute of Economic Growth (IEG), Institute

of Integrated Resource Management (IIRM), International Initiative for Impact Evaluation (3ie), Megh Pyne Abhiyan, Lal Bahadur Shastri National Academy of Administration, Meghalaya Basin Development Authority, Shoolini University of Biotechnology and Management Sciences, Sikkim University, South Asian Forum for Environment (SAFE), Swayam Shikshan Prayog, TATA Institute of Social Sciences, The Energy and Resource Institute (TERI), The Mountain Institute (TMI), The North East Slow Food and Agrobiodiversity Society, and Wildlife Institute of India (WII).

India's national priorities

The National Mission on Sustaining the Himalayan Ecosystem (NMSHE), India's only area-specific mission on the Himalayan states and dedicated to understand and analyze the threats being faced by the fragile mountain system due to climate change. The mission is coordinated by the Climate Change Programme (CCP) of the Department of Science and Technology (DST). ICIMOD has been advised to further strengthen engagement with DST and to formalize the collaboration for joint activities. The GoI has formed the National Institution for Transforming India (NITI Aayog) via a resolution of the Union Cabinet on 1 January 2015. NITI Aayog is the premier policy 'Think Tank' of the GoI, providing both directional and policy inputs. While designing strategic and long-term policies and programmes for the GoI, NITI Aayog also provides relevant technical advice to the Centre and States. NITI Aayog has been soliciting ICIMOD engagement in strengthening national efforts for achieving the Sustainable Development Goals, particularly in the IHR. National Mission on Himalayan Studies (NMHS), launched in 2014-15 by the GoI, focuses upon detailed studies including impact of climate change on ecosystems, wildlife, biodiversity and livelihoods. This will address issue of data and information deficiency in the Himalayan region and support informed actions. Along with the NMHS, Mountain Specific Policy for the conservation of the IHR and the Western Ghats is currently being drafted by the MoEF&CC. ICIMOD's expertise in this respect as well as further engagement with GBPNIHESD for cross learning and dialogue between all relevant stakeholders for the sustainable development of the IHR would lend support to the national priorities. Also, the GoI has announced National Mission for Clean Ganga under the chairmanship of Prime Minister.

Recommendations from the India-ICIMOD country consultation

A country consultation meeting in the premises of the Ministry of Environment, Forest and Climate Change was held on 15 November 2016 with the participation of ICIMOD's nodal ministry and lead institution, other government agencies, the National Institution for Transforming India (NITI Aayog), and representative from all Himalayan States as well as key partners of ICIMOD including the private sector in India. Key recommendations for ICIMOD's MTAP-IV are:

- A joint 'roadmap for the Himalayan States' defining strategic priorities and coordination between all related government agencies, the Himalayan states, and ICIMOD. Focus on programmes on poverty reduction through innovative approaches for mountain agriculture, landscape management, value chain development and branding for high-value mountain products from the Himalayas, market linkages and private sector engagement.
- Effective coordination and transparent flow of information between the Ministry of Environment, Forest and Climate Change (MoEF&CC), GB Pant Institute of Himalayan Environment and Development (GBPIHED), and ICIMOD. As well as putting in place effective coordination mechanism with other line ministries and government agencies to create synergy with national programmes such as – NITI Aayog, ISRO, DST, IMD, Ministry of Earth Sciences, Ministry of skill development among others.
- Enhanced cooperation between the Himalayan University Consortium (HUC) and all concerned mountain research institutes and universities in India with dedicated mountain-relevant degree programmes as well as technical assistance to Indian Universities on topics relating to water management, adaptation to climate change and climate resilience, DRR, energy security, sustainable and equitable development, gender equity, and good governance in the HKH region;

- Emphasis on the Regional Programme on “Mountain Environment and Regional Information System (MENRIS) as a regional platform for data storage and sharing. Expand collaboration with ISRO/ NRSC for access and utilization of earth observation data from India. Further expanding the Regional Programme “Cryosphere and Atmosphere” to support mountain related policies and action plans. Promote exchange of data on glaciers, snow cover, precipitation change and weather variations and evidence based science.
- Engaging the private sector, e.g. for sustainable mountain tourism or via business centres and cases for enterprise development, entrepreneurship skill enhancement, and integrating national skill development agency of national skill development to align national priorities. Also, joining hands for resource mobilization of the MoEF&CC with technical inputs vis-à-vis new climate financing mechanisms like the Green Climate Fund (GCF) and others.

Regional programme: key actions for the MTAP-IV

Key areas for collaborations in MTAP-IV will relate to landscape management, livelihood enhancements, earth observation and information services, climate change resilience, river basins and disaster risk reduction and preparedness and capacity building in these areas. A summary of engagement by regional programmes is outlined below:

- Collaborate with ICIMOD focal Ministry of Environment, Forests and Climate Change, Department of Science and Technology and NITI Aayog on strategic issues of mountain development, while working closely with G.B. Pant National Institute of Himalayan and Sustainable Development at operational level.
- Livelihood opportunities and value-chain development; knowledge sharing and capacity development: Resilience building; Inclusive and Responsible Tourism and Managing transformations
- Building on past success, establishment of National Coordination Committee for inter-country synergy, securing sustainable financial support for the landscape initiative.
- Active interventions towards disaster management.
- Further strengthening three country agreement for conservation and development and policy interventions for illegal wildlife trade, Common branding of VC Products;
- Establishing/strengthening of cross-country working group and mechanisms on Human-wildlife conflict mitigation through ground experiments and generating best practices evidences; Mainstreaming of Landscape Governance capacity building package (ToT);
- Water and climate change adaptation in the river basin context especially from upstream-midstream and downstream issues.
- Regional dialogue on transboundary cooperation across landscapes in Kailash, Kangchenjunga and Far-Eastern Himalaya region.
- Expansion of Upper Indus Basin Network
- Stronger collaboration with partners for usability of data and End to End forecasting – Enhanced partnership for improved end user interface
- Strengthen partnership for increased regional collaboration in cryosphere monitoring.
- Technical support to Bihar government to implement State DRR roadmap
- Support the process of regional knowledge forum to bring the region’s most prominent experts and policy makers on disasters, water, agriculture, energy management
- Strengthen collaboration and policy engagement to mitigate climate and air pollution.
- GEOSS Himalaya partnership to promote and use earth observation for mountain specific applications and regional collaboration
- Promote collaborative research and training with Indian universities; tap on resources provided by Indian higher education institutions and governments for sustainable mountain development in India and the HKH.

6.7 Myanmar

Background

The Republic of the Union of Myanmar is situated in the Southeastern part of the Hindu Kush Himalaya region. Large parts of its Western, Northern and Eastern border areas with India, China, Laos, and Thailand in Myanmar's Chin State, Sagaing Division, Kachin State, and Shan State are mountainous. Myanmar is regarded as a land of diverse culture and traditions and many ethnic groups live in these areas. Enclosed with the mountain barriers are the flat lands where most of the country's rich agricultural land and population are concentrated. As a whole, location and topography, of the country generates a diversity of climatic conditions. The Irrawaddy, the largest and most important river, is sourced by Himalayan glaciers. The Namdapha-Hkakaborazi-Nu Jiang-He of the Eastern Himalayas is another important transboundary biodiversity complex shared by Myanmar, India and China. Endowed with a rich flora and fauna, mineral natural resources, and covered by large extends of natural forest, Myanmar's mountainous areas are crucial for the future development of the whole country. Similar to other RMCs, Myanmar is highly affected by the adverse impacts of climate change and is prone to frequent, heavy natural disasters, especially floods. The current political change, increasing interests by the international community and favorable investment climate for the private sector provide enormous prospects for the socioeconomic development of the country.

Institutional arrangement of ICIMOD and in Myanmar

The Ministry of Natural Resources and Environmental Conservation (MONREC) is ICIMOD's nodal Ministry in Myanmar, and the Forest Department is the designated focal agency. The incumbent Director General of the Forest Department, formally represents Myanmar in the ICIMOD Board of Governors. In 2015, ICIMOD has successfully established an ICIMOD Myanmar Country Desk Office in the MONREC with the underlying rationale to increase ownership and visibility as well as to expand partnerships. The Country Desk aims to enhance Myanmar-ICIMOD collaboration and establish partnerships with other government Ministries and Departments keeping in view with the national development priorities.

Partnership landscape

ICIMOD's key partners in Myanmar include Ministry of Natural Resources and Environmental Conservation (MONREC), Forest Department/ Ministry of Environmental Conservation and Forestry, Chin Organization for Rural and Agricultural Development, Department of Meteorology and Hydrology (DMH), Group of Research and Exchange of Technologies, Ministry of Hotels and Tourism, Myanmar Institute for International Development (MIID), The Myanmar Responsible Tourism Institute (MRTI), Myanmar Survey Research (MSR), Nature and Wildlife Conservation Society, One Map Initiative, Phyo Kyaw Trading, Relief and Resettlement Department, The Institute for International Development, Union of Myanmar Federation of Chambers of Commerce, University of Forestry, Wildlife Conservation Society (WCS), Yangon University, and Yezin Agricultural University (YAU).

Myanmar's national priorities

Myanmar is undergoing a rapid political and socioeconomic transformation. The economy of the country is growing fast owing to robust revenues from natural resources and an influx of foreign direct investment (FDI) and growth of private sector. The world economic forum ranks Myanmar with the highest economic growth in the region with 8.4% in 2016. Myanmar's second five-year plan 2016-17 to 2020-21 includes emphasis on economic development and on further developing the agricultural and tourism sectors for sustainable development. A key priority of the new government is to localize the Sustainable Development Goals and to foster peace for local and national development. Myanmar Action Plan for Disaster Risk Reduction (MAPDRR – 2014) is aimed at integrating disaster risk reduction in sustainable development agenda. The Myanmar Land Use Policy was enacted in 2016 for sustainable land use

management. The Myanmar Climate Change Strategy and Action Plan (MCCSAP) presents a roadmap to guide Myanmar's strategic responses to address climate related risks and opportunities over the next 15 years and beyond. The Strategy and Action Plan aims to support key actors in their decision making at the national and local level to respond to the challenges and opportunities associated with climate change and constituted a multi-stakeholder partnerships called Myanmar Climate Change Alliance (MCCA) under the lead of MONREC. Myanmar has also launched a One Map Myanmar to consolidate geospatial information resources to support informed decision-making by bringing together key actors.

Key recommendations from the Myanmar-ICIMOD country consultation

The Myanmar-ICIMOD country consultation, held jointly with MoNREC and other key partners from government agencies and non-government organizations on 16 January 2017 in Nay Pyi Taw. The consultation identified climate change and climate resilience, DRR and mountain hazards, sustainable mountain agriculture, environmental conservation, natural resource management and governance, ecosystem services, and remote sensing and GIS, and capacity building for Ministry staff as key strategic areas for ICIMOD engagement during MTAP-IV.

- Research on climate change and associated hazards, especially in Myanmar's mountainous regions. Understanding how climate change influences glacier melt, river systems, mountain hazards and implications to the lowland areas of Myanmar.
- Support the government in drafting climate related policies and in developing adaptation and mitigation measures both on local and national level considering mountain perspective. Some key actions in climate change adaptation are livelihood enhancement opportunities, eco-tourism, value-chain development and engagement of private sector.
- Given the increase in frequency and impact of mountain hazards such as floods and landslides, sharing knowledge and expertise in the areas of DRR. Setting up (community based) flood early warning systems, use of space technology for DRR, floods and flash floods.
- A diversified and sustainable agriculture in the mountains is essential in guaranteeing food and nutrition security. ICIMOD's research and piloting as well as approaches for livelihood support are welcomed contributions in terms of value chain development, market linkages and engagement of private sector.
- In order to address the serious degradation of mountain eco-systems, numerous environmental problems due to anthropogenic and other factors like CC, and to better understand complex up-stream and down-stream linkages, ICIMOD should undertake more research on Myanmar's mountain regions especially in relation to river basin management, forest resources management, renewable energy options and conservation of environment.
- Myanmar is experiencing rapid development and multifaceted transformations – ICIMOD's innovations in how to reconcile development priorities and resource extraction with environment conservation and long-term sustainable development would contribute to the countries future sustainable development. Private sector growth accords high priority to reduce poverty and achieve sustainable development goals as well as emphasis on youth and skills development to provide gainful employment opportunities.
- Through technical capacity building in remote sensing and GIS, climate resilience and conservation measures, ICIMOD could support the capacity building of Government and relevant stakeholders and develop applications such as land cover change analysis, forest fire information management system.

Regional programme: key actions for the MTAP-IV

ICIMOD is committed to expand its engagement with the Government of Myanmar in the next MTAP. Key areas for collaborations in MTAP-IV will relate to landscape management, climate change adaptation, livelihood enhancements and value chain, forest management and REDD+; geospatial information services, resilience building, river basins and disaster risk reduction and preparedness and capacity building in these areas. A summary of engagement by regional programmes is outlined below:

- Livelihood opportunities and value-chain development; knowledge sharing and capacity development: Resilience building; Inclusive and Responsible Tourism and Managing transformations
- Establishing REDD+ demonstration site
- Promotion of regional interventions in developing knowledge products on landscape linkages; Sustainable tourism interventions promoting community engagement;
- Protected area management and capacity building;
- Biodiversity monitoring; sustainable collection and trade of biological resources; value chain development-bamboo; Collaborative research-Agro ecosystems.
- Explore possibilities of partnership to support Myanmar in IWRM and flood forecasting
- Capacity building activities on cryosphere to continue. Strengthening regional collaboration and support for development of cryosphere monitoring.
- Collaboration with government on air quality monitoring.
- Land cover mapping and monitoring and linking results to REDD+ initiative
- Remote sensing based automated forest fire monitoring with sms alert system
- Expand the membership to universities in mountainous areas; Provide opportunities to faculty members, researchers and students, especially women and of socioeconomic disadvantaged background, for exposure visit, short training courses, PhD fellowship and capacity building.

6.8 Nepal

Background

Nepal lies in central part of the Hindu Kush Himalayan region with tremendous geographic diversity and inhabited by diverse ethnic population. Nepal's dramatic topography, to large parts defined by spectacular Himalayan mountains and landscapes, is one of Nepal's biggest treasures and provides plentiful natural and cultural capital and provide ecosystem services. As a mountainous country with difficult geographic terrain, Nepal belongs to the most vulnerable countries to the adverse impacts of climate change, and faces a number of interdependent and interlinked challenges such as poverty reduction, water and air pollution, environmental degradation and loss of biodiversity, rapid urbanization and out-migration, access to energy, among others. Nepal is also face increasing frequency and severity of flooding, landslides, and other natural hazards including alarming glacial lake outburst floods (GLOF). The increasingly severe impacts of climate change not only accelerate these vulnerabilities but also require timely and effective adaptation strategies and enhance resilience. Accelerating migration of youth is giving rise to feminization of mountains thereby, putting further pressures on children, women and elderly population. Nepal has undergone immense socio-political change in the recent past. The Government of Nepal and all political parties have promulgated a long awaited constitution and are currently in the process of amending it. Also, the Government of Nepal has laid out an ambitious development agenda with the aim for Nepal to graduate from least developed country (LDC) status by 2022 and to emerge as an inclusive, equitable, and prosperous middle-income country by 2030. Nepal is recovering from a devastating earthquake that struck the country on 25 April 2015 at the crossroad of development.

Institutional arrangement of ICIMOD in Nepal

The National Planning Commission (NPC) as the apex advisory body of the Government of Nepal for development planning functions as ICIMOD's designated nodal agency. The incumbent Vice Chairperson of the NPC formally represents the Government of Nepal in ICIMOD's Board of Governors. Nepal is ICIMOD's host country. ICIMOD was established through the act of parliament in 1983 as an international center with diplomatic status in Nepal. ICIMOD works with the Government of Nepal through collaboration with several ministries and government departments, INGOS, NGO and community based organizations, research and academia, civil society, media and the private sectors.

Partnership landscape

ICIMOD has more than 150 different partners in Nepal. Among them, strategic partners of ICIMOD include National Planning Commission (NPC), Asia Network for Sustainable Agriculture and Bioresources (ANSAB), Dabur Nepal Pvt Ltd, Department of Agriculture, Department of Civil and Geomatics Engineering, Department of Environment, Department of Forests, Department of Hydrology and Meteorology (DHM), Department of Irrigation (DoI), Department of National Parks and Wildlife Conservation (DNPWC), Department of Water Induced Disaster Prevention (DWIDP), Environmental Camps for Conservation Awareness (ECCA), Forest Resource Assessment (FRA), Institute of Forestry, Integrated Development Society Nepal (IDS Nepal), International Organisation for Migration (IOM), Kathmandu University, Ministry of Forests and Soil Conservation (MoFSC), Ministry of Science, Technology and Environment (MoSTE), Nepal Academy of Science and Technology (NAST), Nepal Reconstruction Authority (NRA), Nepal Mountaineering Association (NMA), World Food Programme (WFP), Water and Energy Commission Secretariat (WECS), and World Wildlife Fund (WWF). Other key partners include Asian Institute of Technology and Management (AITM), Bird Conservation Nepal (BCN), Center for Environmental and Agricultural Policy Research, Extension and Development (CEAPRED), Tribhuvan University (TU), Central Department of Hydrology and Meteorology, Centre for the Study of Labour and Mobility (CESLAM), Department of Hydrology and Meteorology (DHM), Environment Conservation and Development Forum (ECDP), Green Governance Nepal, HELVETAS Swiss Intercooperation, Integrated Development Society Nepal (IDS Nepal), International Water Management Institute, Kathmandu Living Labs, MinErgy Pvt Ltd, Nepal Development Research Institute (NDRI), Nepal Forests' Association, Nepal Health Research Council, Nepal Institute of Development Studies (NIDS), Nepal Water Conservation Foundation (NWCF), Patan Academy of Health Sciences (PAHS), PHOTO.CIRCLE, Practical Action, Research Centre for Applied Science and Technology (RECAST), SAARC Business Association of Home Based Workers (SABAH), and Sun Farmer Pvt Ltd.

Nepal's national priorities

The Government of Nepal with its long-term development strategy until the year 2030⁷ that aims at achieving the Sustainable Development Goals (SDGs), operationalizing the Paris Climate Agreement (which Nepal ratified in October 2016) to combat the adverse impacts of climate change, and changing the economic trajectory of Nepal in order to guarantee sustained, equitable, and sustainable economic growth. The year 2016 has been a year of consolidation, continuation, and re-envisioning the development of the country after the devastating 2015 earthquakes and in line with the global Agenda 2030. Currently the GoN is in the process of finalizing its 14th Periodic Plan (2017-19). Today, Nepal's development agenda fully reflects the 17 SDGs. As a member of the UN, Nepal is an integral part of this global initiative and international community is helping Nepal's socioeconomic development. In this respect, Nepal can build on the successful implementation of the MDGs that opened new avenues for the implementation of SDGs for 2016-2030. The GoN is committed to graduate from least developed country (LDC) status by 2022 and to emerge as an inclusive, equitable, and prosperous middle-income country by 2030 with the spirit of a welfare state. The country aims for sustainable poverty reduction and human development with low vulnerability and high human security. Also, the private sector is increasingly becoming an indispensable pillar and active stakeholder for sustainable development and the recent investment summit held in March 2017 received substantial pledges for FDIs from many countries.

⁷ Source: Sustainable Development Goals 2016-2030, National (Preliminary) Report, Government of Nepal, National Planning Commission 2015 http://www.npc.gov.np/images/category/23rd_Jan_final_for_print_Sustainable_Development_Goals1.pdf, and Envisioning Nepal 2030, Proceedings of the International Seminar; Government of Nepal, National Planning Commission and Asian Development Bank 2016 http://www.npc.gov.np/images/category/Envisioning_Nepal_2030_Proceeding.pdf

Key recommendations from the Nepal-ICIMOD country consultation

On 25 November 2016, ICIMOD and NPC organized a country consultation in Kathmandu in order to align ICIMOD's work with Nepal's national priorities and to seek input for MTAP-IV from a wide network of ICIMOD partners in the country. Key recommendations are:

- The National Adaptation Plan (NAP) is very valuable and further support for the implementation of the Local Adaptation Plans for Action (LAPA). Furthermore, innovative approaches to advance Nepal's 'low-carbon-strategy' as well as capacity building on different CC-related issues for both ministry staff and local communities. Key areas include livelihood enhancement, building resilience of communities, early warning system among others.
- Due to out-migration and other factors, 25-30% of agricultural land has gone fallow, agricultural yields per unit have dropped and productivity continues to be low while a creeping feminization has become one dominant feature of the mountain regions. ICIMOD should continue its work on value chains and high-value products (HVP) from mountains and develop new approaches for branding and certification mechanisms for organic products from the mountains. There is also need to better understand the drivers of migration in order to provide mountain people with other options.
- For earthquake reconstruction, ICIMOD could support the NPC and NRA with geological mapping assistance and scientific evidence for new settlements. Also, ICIMOD's proposed Resilient Mountain Village approach could help make new settlements more resilient to natural disasters and to create livelihoods e.g. from specialized agriculture, community-based tourism and skill and entrepreneurship development.
- Nepal's new constitution has opened new avenues for a better integration of policy and planning processes. As a knowledge centre, ICIMOD should continue to create knowledge, disseminate and translate it and make it available for policy makers and development planners. There is an urgent need for integrated and multi-sectoral policies towards environment and sustainable development especially aligning with the SDGs. Also tapping into global opportunities such as climate financing mechanisms from GCF and AF.
- Important to work with several government agencies to help mainstream biodiversity protection and ecosystem services into government policies and to provide technology transfer and capacity building on various environment related issues for concerned ministry staff. Also, building upon the current efforts on landscape management and cooperation with the neighbouring countries.
- In order to achieve SDG 5 on gender equality and empowerment of women and girls, more efforts towards a real transformative change are needed. The existing data on women needs to be better analysed and better utilized in order to assess trends for transformative change and to better understand women's contributions to economic development and income support in rural areas.
- Use of innovative technology such as GIS and RS and enhancing capacity of government departments to provide operational information services on climate, agriculture, forest, disaster.
- In line with the SDGs, the GoN considers the private sector crucial for advancing its development agenda. The private sector can play an important role in employment creation which in turn can help to mitigate out-migration. In order to facilitate this, the GoN recognizes its paramount role to create a stable and enabling business climate that especially helps small private enterprises in rural areas to flourish. Also, empowering youth and creating gainful employment opportunities is a priority.

Regional programme: key actions for the MTAP-IV

ICIMOD is committed to expand its engagement with the Government of Nepal in the next MTAP. Key areas for collaborations in MTAP-IV will relate to landscape management, climate change adaptation, livelihood enhancements and value chain, forest management and REDD+; geospatial information services, resilience building, river basins and disaster risk reduction and preparedness and capacity building in these areas. A summary of engagement by regional programmes are outlined below:

- Livelihood opportunities and value-chain development; knowledge sharing and capacity development: Resilience building; Inclusive and Responsible Tourism and Managing transformations
- Support nomination of KSLCDI as a world heritage site.

- Strengthening regional cooperation framework further to gain national support and transboundary tourism and common branding; Focusing on Kailash and Kangchenjunga landscapes
- Developing REDD+ Biodiversity Monitoring Protocol. Developing and additional District REDD Action Plans; Implementation of rangeland policy.
- Pilot on spring revival, Linking farmer managed irrigation system with climate and water adaptation issues; climate resilient mountain villages; strengthening capacities at the local level by having research benefits local programming and vice versa.
- Support regional flood information system and capacity building
- Strengthening regional collaboration and support for the cryosphere monitoring programme.
- The Koshi Basin Programme (KBP) will collaborate with DSCWM to make Water Management plan, with GWRDB to assess Ground Water use potential, MOAD to improve drought monitoring, CBS to improve gender assessment
- The KBP will continue to support MOPE to improve its capacity to ensure environmental sustainability of HP development
- Capacity building activities air pollution monitoring
- Large scale energy efficiency improvement and emission reduction in brick sector
- Use of geospatial technology to provide operation information services on Agriculture monitoring, Flood early warning, Thunderstorm forecast and Climate services
- Expand the member network; provide opportunities to faculty members, researchers and students, especially women and of socioeconomic disadvantaged background, for exposure visit, short training courses, PhD fellowship and capacity building.

6.9 Pakistan

Background

Pakistan's geographic area is to almost 61% mountainous with large parts of Balochistan, Khyber Pakhtunkhwa, the Federally Administrated Tribal Areas, Gilgit-Baltistan, and Azad Jammu and Kashmir characterized by highly diverse mountain landscapes. These mountain areas with their complex ecosystems are rich in biodiversity and provide a wide range of natural resources including forests, minerals, pasture lands, and water – all of which are important for both the local and national economy. Fed by precipitation and significant snow and glacier melt, many of Pakistan's great rivers including the Indus river system and the Jhelum originate in the Northern mountainous areas and thus provide much of the Pakistan's surface water, indispensable for irrigation, hydro-power, and water supply of the whole country. The livelihood of many of Pakistan's mountain people depends on subsistence agriculture, livestock, common pasture and rangeland, forest, and additional non-farm activities. However, among Pakistan's mountain people poverty and food insecurity is widespread and mountain ecosystems are degrading rapidly due to increased socioeconomic activity, overuse of natural resources, land use changes, urbanization, and climate change, among others. Pakistan is extremely vulnerable to the adverse impacts of climate change exemplified by increasing numbers of extreme weather events and hazards both in the upstream and downstream areas.

The Government of the Islamic Republic of Pakistan has put forward several initiatives in order to strengthen the livelihoods of mountain people and protect fragile mountain environments. Combating against climate change is a key government priority and the commitment to achieve the Sustainable Development Goals is underlined by a strong policy agenda outlined prominently in the Pakistan Vision 2025.

Institutional arrangement of ICIMOD in Pakistan

ICIMOD's nodal ministry in Pakistan is the Ministry of National Food Security and Research (MNFSR). The incumbent Secretary of the Ministry of National Food Security and Research formally represents the country in the ICIMOD Board of Governors. At the request of the nodal ministry and hosted by the

National Agriculture Research Centre, Islamabad, ICIMOD has established a Pakistan Country Office in October 2006. The country office coordinates ICIMOD's Regional Programme activities within Pakistan, supports ongoing government initiatives related to mountain specific policies and programmes, and functions as an interface for the collaboration of ICIMOD's diverse development partners in the country.

Partnership landscape

ICIMOD's key partners in Pakistan include Ministry of National Food Security and Research (MNFSR), Aga Khan Rural Support Programme (AKRSP), Bio-inspired Simulation and Modeling of Intelligent life laboratory (BiSMiL), COMSATS Institute of Information Technology, FOCUS Humanitarian Assistance, Forest Wildlife and Environment Development, Gilgit Baltistan Forest- Wildlife and Environment Department, Institute of Space Technology (IST), Karakoram International University (KIU), LEAD Pakistan, National University of Computer and Emerging Sciences, National University of Sciences and Technology (NUST), NWFP Agricultural University, Pakistan Agricultural Research Council (PARC), Pakistan Council of Research in Water Resources (PCRWR), Pakistan Institute of Development Economics (PIDE), Pakistan Meteorological Department (PMD), Pakistan Water and Power Development Authority (WAPDA), Pakistan Wildlife Foundation (PWF), Pir Mehr Ali Shah ARID Agriculture University and Consortium of Research and Development Organizations (PMAS-AAUR and CRDO), Rural Support Programme Network (RSPN), Shaheed Benazir Bhutto University, Sustainable Development Policy Institute (SDPI), SAARC Chambers of Commerce and Industry (SAARC CCI), University of Swat, Water and Power Development Authority (WPDA), and WWF- Pakistan.

Pakistan's national priorities

Pakistan's Vision 2025 with its seven pillars of People First, Growth, Governance, Security, Entrepreneurship, Knowledge Economy, and Connectivity, functions as a blueprint for the future development of the country and envisions Pakistan as one of the world's ten largest economies by 2047. As the first country in the world, Pakistan has adopted the Sustainable Development Goals as its own national development agenda. To combat climate change, to conserve mountain ecosystems, and to protect biodiversity, a number of policies including the Pakistan Climate Change Act in 2016, the National Policy on Disaster Risk Reduction, and the National Biodiversity Strategy Action Plan have been enacted while the proposed National Water Policy and the National Flood Protection Plan IV will further guide the countries water and flood management. In order to address the increasing dangers of glacial lake outburst floods (GLOF) and to scale-up GLOF risk reduction in Northern Pakistan, the Green Climate Fund has also approved a proposal put forward by the Ministry of Climate Change. In addition, regional initiatives of the Government of Pakistan such as the China Pakistan Economy Corridor (CPEC) with regional exchange between ICIMOD's member countries and specific recommendations to foster the socioeconomic development of the mountainous regions along the corridor.

Key recommendations from the Pakistan-ICIMOD country consultation

ICIMOD has been engaging with the Government of Pakistan in sustainable mountain development and to work together with its partners by providing science-based evidence for development planning and mountain-specific policies, by developing innovative approaches for livelihood support and resilience of mountain people, flood early warning systems and disaster risk reduction mechanisms, and by developing sustainable natural resource management frameworks.

- Climate change is increasingly impacting the mountainous regions of Pakistan and visible by the rise in temperatures, increase of severe floods, heat waves, droughts, and other extreme weather events, adding to Pakistan's vulnerabilities. Climate change research for long-term monitoring of the impacts of climate change and devising innovative solutions. Also, an expansion of research on the cryosphere and atmosphere is needed.

- Given the serious problem of water scarcity, water storage and rain water harvesting for agriculture and efficient utilization. Watershed management is a growing concern in mountain areas of Pakistan. Sedimentation affects a large number of small landholders. Innovative use of technology on flood early warning systems and watershed management is a priority.
- Despite the large hydro power potential, energy is still not available for many mountain people. New ways for generation of clean energies in the mountains need to be developed in order to fully exploit the economic potential of the region. Also, low carbon and green, energy efficient technologies and off-grid solutions need to be developed and made available in the mountainous regions.
- Data gap remains a huge issue, technology and innovations for data generation and management for mountain related issues. Also, technology such as GIS and RS to translate data into actionable information to support evidence-based policy interventions.
- Agriculture is the backbone of Pakistan and mountain agriculture is a key priority, which is linked to food security, water management, and mountain poverty. Focus more on mountain horticulture and niche mountain products to generate incomes for local community and develop value chains and providing access to market linkages through the engagement of private sector. Also, focused programmes for climate change adaptation for mountain farmers.
- Initiatives like IFAD's Economic Transformation Initiative Gilgit Baltistan (ETI) with the focus on increasing mountain agricultural production, introducing new cash crops and developing infrastructure would be good synergy. In addition, CPEC is becoming more and more a reality in Northern Pakistan and ICIMOD should further explore the related opportunities for the improvement of livelihoods of mountain people but also what are the underlying risks of this economic and infrastructure initiative.
- Engagement of private sector on mountain goods, products and services and linking them with access to finance and market, as well as emphasis on youth for creating viable opportunities through skill development and employment.

Regional programme: key actions for the MTAP-IV

Key areas for collaborations in MTAP-IV will relate to landscape management, livelihood enhancements, ecosystem management, landscapes, earth observation and information services, climate change resilience, river basins and disaster risk reduction and preparedness and capacity building in these areas.

A summary of engagement by regional programmes is outlined below:

- Livelihood opportunities and value-chain development; knowledge sharing and capacity development: Resilience building; Inclusive and Responsible Tourism and Managing transformations
- Continue support Trans-boundary Hindu Kush, Karakorum, and Pamir Landscape
- Establish Indus flood outlook: Cryosphere monitoring and strengthening capacity and regional collaboration
- Upscale Brick kiln innovations for energy saving and emission reduction
- Collaboration with government on air quality monitoring
- Use of geospatial technology to provide operational information services on drought monitoring and forecasting
- Revive and sustain interest and ownership among higher education institutions in the mountainous areas; provide opportunities to faculty members, researchers and students, especially women and of socioeconomic disadvantaged background, for exposure visit, short training courses, PhD fellowship, and capacity building

7. Gender Transformative Change

In this section, we review the ways and means by which considerations of gender, and, in particular, the concept of “gender transformative change” inform ICIMOD’s work.

The nature and pace of global, economic, socio-cultural, and environmental change differentially impacts women, men, and children. Increasingly, the adaptive capacities of people to navigate these changes depend on their access to resources, knowledge, services, and meaningful engagement with development and governance institutions. The division of gender roles and ownership of resources also affect the quality and types of resilient responses that women and men are able to actuate when facing socioeconomic and environmental changes. Experience shows that people manage and cope with these new realities in different ways due to socially-constructed norms and relations of power. However, despite many years of ‘gender mainstreaming’ within development, gender inequalities persist in the form of discrimination, exploitation, and disenfranchisement. It is these tenacious gender inequalities and biases, compounded further by other stratifying elements (e.g., class, caste, age, ethnicity, and marital status) that continue to hinder the achievement of sustainable development and sustainable environments.

ICIMOD envisions a future shaped by gender transformative change: Change that goes beyond identifying and exploring the symptoms of gender inequality to address the social constructed norms, attitudes, and relations of power that underlie them. Gender transformative change promises a future where women are not disproportionately affected by environmental challenges; where women and men have equal livelihood opportunities; where women and men have equal voices in decision and policy making at all levels; and where both women’s and men’s needs and knowledge are taken into account in all policy and practice. Thus, gender transformative change means addressing the gender and power imbalances that shape current gender relations, and replacing those with more equitable relationships between women and men

Recognizing that a gender transformative change is fundamental to our vision and mission, and building on the progress made and the lessons learned during MTAP-III, ICIMOD adopts a Gender Transformative Approach (GTA) to overcome persisting inequalities by not only identifying the gender gaps and inequalities, but also by addressing discriminatory social and gender norms, practices, attitudes and relations of power. ICIMOD employs GTA to integrate gender concerns and issues in all its programmes.

7.1 Pillars of Transformative Change

GTA is committed to rigorous gender analysis, organisational change, and gender positive impact through meaningful participation of women and men in leadership, policy, and decision-making processes (Figure 7.1). Thus, ICIMOD’s approach and strategy for achieving gender transformative change rests upon these four pillars:

Integration of gender into research agendas

- ICIMOD employs a two-pronged approach to integrate gender concerns into its research agendas: Strategic gender research (gender focused research): ICIMOD will conduct research on gender-specific and policy-relevant issues to generate evidence-based recommendations to guide priority setting and planning. This work will generate a deeper understanding of strategic gender interests for making change in norms, constraints, the division of labor, access and control of assets, and opportunities for full participation in the livelihood pathways and processes.

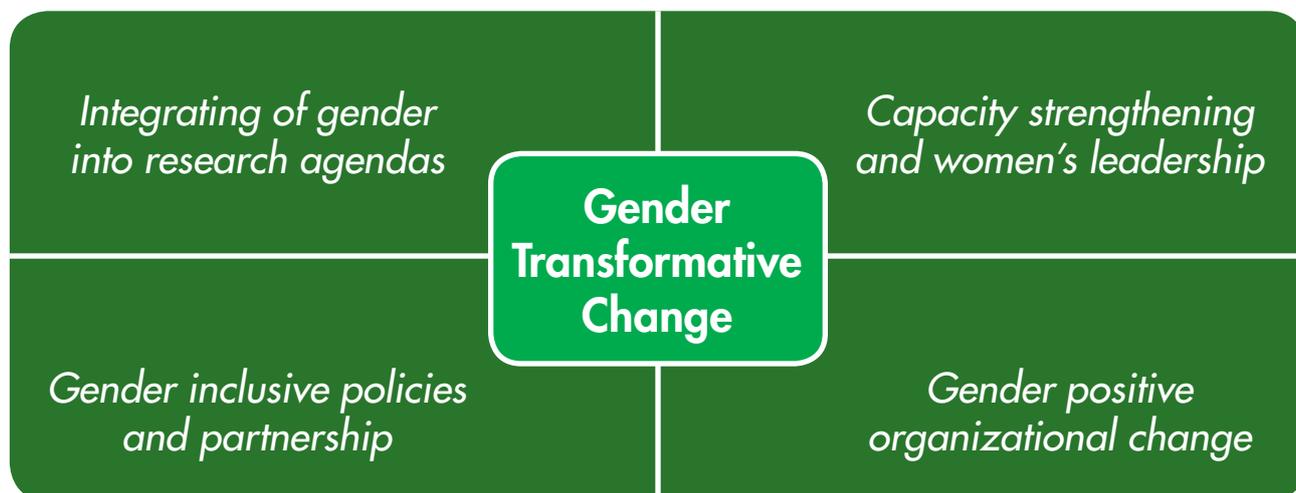


Figure 7.1: **Four Pillars of Gender Transformative Approach**

- Gender analytical research (gender integrative research): Such research will be more operational and specific, falling within individual programmes and initiatives. This will include gender-disaggregated data collection and analysis to improve understanding of the differential roles, needs, constraints, preferences, and opportunities for women and men for enhanced systematic targeting of the programmes and initiatives to achieve quality outputs and outcomes.
- In support of these approaches, we will undertake the following priority actions: Design, develop and create programmes and initiatives to highlight and challenge harmful gender norms and inequities, and, where possible, redress gender disparities among men or women by examining, questioning, and challenging underlying social and gender norms and imbalances of power;
- Develop gender sensitive and/or gender responsive programmes, implementation, monitoring and evaluation, and knowledge sharing;
- Integrate rigorous gender analysis into programmatic research and action;
- Ensure that pilots and other development interventions deliver equitable benefits to women and men;
- Enhance monitoring systems to systematically track results on gender and equity issues; and
- To develop institutional implementation guidelines for a Gender Action Plan.

Capacity strengthening and women's leadership

Capacity strengthening and women's leadership is an essential element and will be designed to promote change both in the institution and in the programmes. Therefore, capacity strengthening and women's leadership as an approach will be taken to identify constraints or challenges faced by women (and men) in realizing their full potential and capacity, and design appropriate interventions and measures to strengthen their capacities particularly on gender issues, gender analysis, and women's leadership

In support of this objective, we will undertake the following priority actions:

- Provide leadership, management, and negotiation trainings for women, and include men in these trainings as allies;
- Promote women's leadership in key institutional posts across ICIMOD;
- Seek proactively and include women in equitable numbers to capture gender needs, targets, achievements, and participation; and
- Provide mentoring to women professionals.

Gender inclusive policy and partnerships

Recognizing that women and men are affected differently by policies and programmes, creating gender-inclusive policies and partnerships is critical. This entails advocating, developing, and adopting gender

inclusive policies, as well as translating and operationalizing these policies at the organizational and practice (partner) levels.

In support of this objective, we will undertake the following priority actions:

- Maintain explicit policies, rules, procedures that enable equitable systems that promote gender equity in hiring, tenure, and promotion;
- Ensure enhanced gender impacts by strengthening the gender expertise of partners;
- Identify groups that are strong in gender and socio-cultural analysis and engage them for working within partnership strategies;
- Expand existing ICIMOD institutional and stakeholder networks and partners to include gender-focused institutions that can provide feedback on relevant processes and programmes; and
- Create a gender action plan that follows established policy to improve institutional accountability regarding gender issues.

Gender positive organizational change

Gender positive organizational change describes approach rather than a “stand alone” activity to achieve gender equitable effects, and ultimately gender equality, by strengthening institutional capacities and positive organizational change with a focus on gender empowerment. To guide this work, we draw upon ICIMOD’s Gender Equity Policy, drafted in 2013. This document lays out a blueprint that we follow to heighten gender sensitivity and gender equity measure throughout the organization. In 2016, we conducted a gender audit of ICIMOD, led by the Director General, to self-assess our progress toward achieving gender equality objectives.

In support of this objective, we will undertake the following priority actions:

- Enforce the Gender Equity Policy, 2013;
- Incorporate gender equality requirements into ICIMOD’s Strategy and Results Framework and performance appraisal systems;
- Harmonize and institutionalize policy and practice on work-life balance and career advancement of women professionals;
- Cultivate, promote and support gender equality champions and agents of change, such as ICIMOD’s Gender Resource Team (GReaT); and
- Promote and support efforts to change conventional and stereotypical practices and perceptions of gender roles and the differential allocation of duties between men and women.

7.2 Implementation of Gender Audit Recommendation

ICIMOD’s 2016 Gender Audit 2016 resulted in ten recommendations to be integrated in the MTAP-IV (Box 1). We elaborate on these recommendations in the sections below. ICIMOD’s Gender Action Plan (GAP) is a critical strategy for implementing the Gender Audit recommendations.

The responses to the recommendations are embedded in the strategies and priorities discussed in the sections below.

7.3 Enhanced Role of Gender within ICIMOD and Partners

ICIMOD will take a strategic approach to gender issues in the organization, and address them in a cross-cutting manner through our programmes and initiatives. In moving toward gender transformative change, our approach will be to engage women as assets and leaders, not as victims or passive beneficiaries, and to engage men as assets and part of solution, not as problems.

With our approach, the objective will be to effectively mainstream gender into the theory of change and impact pathways of all the programmes. We will do this by applying a gender and social equity lens to

six steps: i) problem analysis, ii) objective setting, iii) actor analysis, iv) risk assessment, v) strategy design, and vi) M&E plan development.

Gender and social equity will be duly considered while selecting partners and building their capacity. We will provide instruction and encouragement for actor analysis and due diligence to ensure partners' capacity for promoting social inclusion and gender justice in all ICIMOD programme and initiatives.

During the MTAP-IV, to enhance gender integration and gender equity within ICIMOD and our partners, we will adopt and execute the following strategies:

Gender Action Plan: ICIMOD's 2016 Gender Audit stresses operationalizing the Gender Equity Policy through a Gender Action Plan (GAP) to improve accountability with agreed and feasible monitoring and evaluation (M&E) metrics and timeline. Taking cues from these recommendations, the GAP and integrating gender equality results and indicators into the GAP will be a crucial during the period of MTAP-IV.

GAP will ensure improved gender integration at ICIMOD, operationalize our gender policy, and create an accountability mechanism. The GAP will be developed at two levels: institutional (for strategy development and implementation guidelines) and programmatic/initiative (which will include finer details such as activities, time lines, budgets, and responsible persons). The GAP will include:

1. Objectives and goals – clear statement of the gender objectives to be achieved
2. Strategies and activities – detailed description of the actions required to achieve the stated objectives.
3. Inputs required – details regarding the time and resources required to support the stated actions.
4. Indicators – details about what gender indicators will be measured to monitor and track our progress toward fulfillment of our objectives.

Monitoring and evaluation: We will develop gender sensitive indicators that will enable us to track progress and change in the organization. The indicators will be developed at the initiative/project, programmatic, and partner levels.

- *Project level* – We will assess the gender sensitivity of the various components and cycles, including reporting, and the extent to which the outcomes and impacts achieve the goals of gender equity and equality we will develop appropriate gender-sensitive indicators for monitoring.
 - *Programme levels* – We will conduct gender evaluations and use the results to guide further activities, through checklists and other relevant methods.
 - *Partners level* – We will conduct gender audits of partner organizations.
- What to Monitor?

At the organizational level:

- Number of women in leadership roles/decision making positions and designated structures/staffing for gender equality and women's rights;
- Level of staff satisfaction on transformative leadership with regard to gender;
- Use of sex-disaggregated data in higher level policy initiatives, progress reports/evaluations; and
- Results-Based Management including Gender Equality/Women's Rights result statements and indicators

At the programmatic level:

- Differences in rates of participation, benefits, outcomes, and impacts for women and men;
- Changes in gender relations (positive or negative)—that is, changes toward equality, or changes in inequality between men and women; and
- How these changes impact the achievement of development objectives, particularly climate change adaptation, poverty reduction, and sustainable development.

Box 1: Recommendations of ICIMOD's 2016 Gender Audit

- Operationalise ICIMOD's Gender Equity Policy through a Gender Action Plan;
- Improve accountability with agreed and feasible M&E metrics, with a timeline for adding additional metrics;
- Strengthen the core gender institutional function for strategic orientation, quality control, and cross-cutting research and learning;
- Ensure that adequate gender expertise and budget resources are available and accountable in all Initiatives and Programmes – commensurate with the growth of ICIMOD;
- Evaluate, share, and systematize use of existing good practices on programming from current ICIMOD programmes and initiatives as well as from gender-responsive partners;
- Strengthen ICIMOD staff capacity on gender integration and analysis through training, reflection, and sharing of ICIMOD and other good practices;
- Continue gender-sensitive approaches of human resource and knowledge management and communications, and strengthen where appropriate;
- Establish a "mentoring culture" that provides opportunities for learning and growth into professional and management roles by both women and men, to improve gender balance;
- Assess the existing gender capacity of partners and prepare a plan to increase their capacity and commitment to gender integration; and
- Carry out another gender audit prior to preparing the MTAP V (2022-2026).

The Strategic Planning, Monitoring, and Evaluation (SPME) and Gender teams will work closely with programmes and partners to monitor this work.

Capacity Building: Integrating gender analysis and gender sensitive and/or gender responsive action into the work of ICIMOD and its partners requires building capacity at different levels. Strategic actions to achieve this are:

- Providing direct support to programme staff and partners.
- Provide various gender trainings – gender sensitivity, gender research methodology, and gender analysis.

7.4 Gender Integration

Apart from integrating gender into our programmes and initiatives, ICIMOD seeks to integrate gender at all levels of the institution. Therefore, institutionally increasing gender responsiveness is crucial for our work during MTAP-IV. To streamline this, a strategic GAP at the Institutional level will be developed with implementation guidelines. Among the actions we would undertake in support of this goal, we will:

In support of this objective, the Gender Lead and Team will undertake the following priority actions:

- Encourage critical awareness among men and women staff about gender roles and norms;
- Promote women's leadership in key institutional posts;
- Challenge conventional and stereotypical practices, conventional perceptions of gender roles, and the gender differentiated allocation of duties among male and female staff;
- Advance individual gender-equitable behaviours and create more gender-equitable relationships;
- Maintain policies, rules, procedures that enable equitable systems; and
- Expand existing ICIMOD institutional and stakeholder networks and partners to include institutions engaged in gender-focused work and programmes.

8. Knowledge Management and Communication

8.1 Rationale

Efficient knowledge management and effective communication are fundamental to achieving ICIMOD's objectives as a regionally focussed, globally-oriented institution for knowledge initiatives on sustainable mountain development in the HKH. Evidence-based policy and purposive impact are predicated on generating high quality knowledge and disseminating it to appropriate audiences and constituencies at the appropriate time and in the appropriate manner. ICIMOD produces knowledge at the intersection of its thematic areas and programmatic initiatives, and this knowledge can raise awareness, guide policy, influence opinion, inform behaviour, steer intervention, engineer adaptation and result in cumulatively favourable impacts on mountain environments. Central to accomplishing this is are both a goal-oriented, streamlined and up-to-date internal system within ICIMOD that supports and integrates knowledge production and knowledge sharing as mutually reinforcing processes and a clear focus on science communication as the foundation of public opinion.

8.2 Knowledge Management

Knowledge management entails the use of an optimum combination of tools and practices, modes and models, protocols and processes, methods and means of conceptualizing, generating, capturing, organising, storing, sharing, and promoting knowledge institutionally, as well as creating derivative, value-added products and services. This involves co-ordinating different components of the knowledge production process to align goals, motives and objectives within the larger institutional vision and mission. Achieving these ends requires planning and strategizing and the timely internal delivery of data so that knowledge production is not only based on the best possible inputs available at a given time but is also consistent with overall principles, objectives and targets. Knowledge management fosters institutional capacity through internal dialogue.

ICIMOD's knowledge management agenda is designed to meet the region's evolving knowledge and information needs, particularly in the context of accelerating climate change. Rapid changes in tools and technology have enhanced and modernized ICIMOD's knowledge management system in many positive ways; but these changes also pose challenges. Asymmetries in technological diffusion and infrastructural capacities can and do leave remote rural mountain areas underserved, widening the digital divide and the consequent information gap. Moreover, even as ease of communication provides opportunities for capturing information, it also presents potential problems such as information overload, authentication of information, and unintentional exclusion of local views.

To meet such challenges and to service ICIMOD's in-house knowledge production needs KMC maintains and deploys a variety of tools to ensure that knowledge management is articulated to ground realities and integrated into institutional processes so that all ICIMOD's units are interlinked. The smooth flow of relevant information for efficient knowledge production requires a well-functioning network that connects mountain and research communities. To ensure this, KMC manages continuous support services for the knowledge production process and provides end-to-end facilitation, from inception to publication.

Optimising knowledge exchange and knowledge aggregation and maintaining a robust environment for open access, and peer-to-peer collaboration are essential elements of KMC's mandate. Apart from the routine aspects of knowledge management, this work involves:

- Strengthening the identification and dissemination of ICIMOD’s key messages;
- Strengthening networking activities, especially among ICIMOD’s knowledge partners;
- Building capacity in our content producers;
- Adopting, with discernment, improved tools and methods;
- Promoting the preservation and uptake of information and knowledge through proper stewardship and management of ICIMOD’s repository platforms—the Information Resource Centre and the Godavari Knowledge Park;
- Ensuring smooth functioning of internal publication processes through the Publications and Outreach Committee; and
- Creating value-added products with emphasis on external communication to maximise knowledge and brand amplification.

Key messages: In its institutional role and through its work with the Themes, Regional Programmes and Initiatives, KMC can strengthen its function of extracting key messages from the science research and other work of ICIMOD to support research-into-use and to amplify messages through appropriate products and platforms. The aim is to extract messages according to relevance for different audiences and deliver them through the most effective channels—inputs to policy makers to incorporate in plans and policies, to the general public to influence behaviour, to local communities to incorporate in sustainable livelihood and conservation strategies, to the media to raise awareness etc. Key personnel of KMC, particularly focal persons, will focus on appropriate and effective message delivery.

Networking: KMC can play a more active role in supporting ICIMOD’s partnership approach through increased engagement with Knowledge Partners and in providing communications guidelines appropriate to various partnership agreements. In addition, KMC continues to link ICIMOD personnel with external professionals in the relevant thematic fields through both formal and informal networks, through its participation in evolving platforms such as e-discussions, list-serves, social media, podcasts, and other emerging media options.

Capacity building: KMC’s efforts are geared towards strengthening human and institutional capacity both within ICIMOD and among partners for effective knowledge exchange and communication. Internal capacity building, supported by Human Resources, is focused on the sustained development of a learning and knowledge sharing culture, including internal guidance on the use of social media, improved organization and sharing of information, the ethics of professional scientific work, and other dissemination tools.

Improved tools and methods: KMC continuously upgrades its tools and methods to support internal and external knowledge sharing and capacity building. It supports trainings organized by the Regional Programmes and Thematic Areas through the development of e-learning tools and content. The data sharing and intellectual property rights policy and the implementation of the strategic plan is intended to promote data and knowledge sharing within and outside ICIMOD on open access principles while at the same time protecting authorship through appropriate crediting and citation requirements.

Information Resource Centre: The ICIMOD Information Resource Centre is a crucial node in knowledge management. It collects, preserves, organizes and shares mountain-relevant knowledge, through, among others, the HIMALDOC system, and provides an extensive range of contemporary and historical knowledge to both internal and external users. The Information Resource Centre is the main conduit through which ICIMOD delivers comprehensive open access data to users all over the world. As the central unit of ICIMOD’s knowledge delivery mission, the Information Centre will continue to develop as an innovation hub for information dissemination, introducing new and experimental tools and ideas and expanding the public availability of ICIMOD’s corpus of knowledge and information. Specific strategies for improved information resource management in the medium term will include:

- Establishing of a network of libraries and resource centres through the Himalayan University Consortium;
- Promoting and distributing ICIMOD's publications, both hard copy and electronic, through its central databases; and
- Developing HIMALDOC further as a public repository of publications, documents, photos, and other media for ICIMOD, partners, and Himalayan University Consortium members.

Godavari Knowledge Park: The Godavari Knowledge Park (GKP) supports ICIMOD's focus on innovating and demonstrating sustainable technologies and conservation of natural resources. The site will continue to consolidate its applied function to complement and implement ICIMOD's theoretical and field-based research. A Technical Committee of the Knowledge Park aims to position GKP as a hub for driving innovation and technology dissemination benefitting the local area, the country and all RMCs. It has undertaken a Landscape Journey process to develop strategies that will integrate GKP as part of a larger Godavari landscape with mutually supporting interactions. Additionally, it aims to technically support GKP in its development of a network of such sites in as many RMCs as possible, in tandem with field demonstrations. As an open learning centre promoting green technologies and sustainable natural resource management in the mountains, GKP will attempt to become self-sustaining through a combination of partnerships, income-generating activities, and institutional fiscal support.

KMC will pursue a strategy of tapping potential synergies with other institutional actors in the private and public sectors to build partnerships and attract sponsorships for upgrading and financing GKP. In particular, KMC will attempt to leverage the corporate social responsibility commitments of large institutions to increase the GKP's financial capacity to expand its activities and services. A fiscal assessment of current expenditures, revenue streams, potential and projected activities, and financial needs based on a systematic plan, will be conducted. This work is a prelude to making the Park a significant branding avenue for the practical dimension of ICIMOD's knowledge activities. Among other possible activities that may be considered are a periodic sustainable mountain technologies trade fair and exhibition, a catalogue of technologies and products, a product innovation lab, more extensive artisanal and product training (especially mobile training), and a regional chain of ICIMOD stores retailing certified HKH products.

The Publications and Outreach Committee: KMC's Senior Manager has principal responsibility to manage the Publications and Outreach (POUT) committee, which serves as the ultimate authority for approval of all matters related to ICIMOD publications. POUT is empowered to formulate editorial, production, and distribution policies and procedures, and is responsible for the scientific quality of ICIMOD's publications.

The Committee will continue its responsibilities for:

- Establishing and maintaining systems for publication submission;
- Receiving, reviewing, and approving all ICIMOD publications, including journal articles and book chapters;
- Prioritizing and selecting proposed and submitted publications;
- Identifying target audiences for all publications and determining the most appropriate means for dissemination within the overall Knowledge Management and Communication Strategy;
- Establishing TORs guiding the appointment of reviewers for peer review;
- Reviewing and revising the Publications Procedures and Guidelines; and
- Assessing, periodically, the adequacy of ICIMOD's human and financial resources in Publications and Outreach including guidelines for budgeting.

Value Added Products: KMC is a key component of ICIMOD's public interface, managing its external communication and converting its knowledge into value-added knowledge products accessible to a range of target audiences belonging to different demographics. This activity links knowledge management with knowledge communication, the point at which the output of research is customized for specific purposes,

using different media platforms to reach different constituencies for different purposes, cumulatively enlarging the influence of ICIMOD's science among a larger public. Communicating science to other scientists is different from communicating science to non-scientists. Communication between scientific peers uses the professional language of science, with its specialized terminology and semantics, not only for the ease of comprehension but also to ensure both the credibility and gravitas of the research and knowledge. This is a very important function of science communication. An equally important function of science communication is to translate scientific knowledge and transmit it to other professionals and lay people unfamiliar with the technical language of science.

Presently ICIMOD's communication with the rest of the scientific community is based on a high-level of research accomplishments and publications. But communication with other constituencies, particularly policy makers, media persons, and students and teachers can become more refined. At a time when scientists are competing with science-sceptics for the attention of both the public and policy makers, it is very important for credible scientific writing to be made accessible to inform and influence opinion. Apart from its routine publishing activity, KMC will focus on using the entire spectrum of traditional media and new media to deliver customized messages in appropriate formats and styles to consolidate ICIMOD's position among its existing audiences and to cultivate a presence among new audiences through:

- Extracting key messages from ICIMOD's science for repackaging into knowledge products targeted for specific audiences;
- Identifying KMC's current strengths and weaknesses through a knowledge impact audit;
- Adopting and developing a range of new products and formats based on impact analysis;
- Emphasizing principles of high quality science communication across the institution;
- Complementing its current corpus of knowledge products with products tailored specifically to inform lay audiences;
- Coordinating across ICIMOD and with the Himalayan University Consortium, planning a set of flagship products across different media platforms, potentially including booklets, anthologies, knowledge events, brand mementos, periodical publications, reference literatures, and video classrooms on mountain issues for inclusion in school curricula; and
- Using brand ambassadors to give headline publicity to ICIMOD events, knowledge products to a mass audience through Facebook, Twitter, Instagram, and other social media.

8.3 Communication

If the finished knowledge product is the final stage of the knowledge production process, that is just the first stage in the public communication process – the link between internal production and public communication. The knowledge product is designed both to contain and communicate knowledge. Effective communication is, therefore, the end purpose of product design.

Communication is the process of transmitting information with purpose and clarity from those with knowledge to those who want knowledge. In modern conditions, with the proliferation of media, it involves the appropriate choice of message, medium, style, format, design, time, and mode of delivery to suit each kind of audience. The choices made for a student audience will be very different from the choices made for policy makers. It is imperative for KMC to focus on streamlining and customizing its communication strategy to suit the needs of different demographics.

KMC's communication strategy includes publishing, media relations, social media engagement and public outreach activities to disseminate ICIMOD's knowledge and messages effectively for different audiences, thereby positioning ICIMOD's presence in various public niches. To effectively focus on science communication, KMC will work with programmes to be more selective and strategic in their approach to publication. While programmes must be documented, that need not be the focus of the publication strategy. Instead, more streamlined, strategic rather than strictly programmatic publishing offers the prospect of more multidisciplinary outputs that are scientifically rigorous.

Apart from the traditional long form publications and web-based content packaging, KMC will also aim to further develop other informal formats, such as blogging, that can attract more traffic to the website, more attention to print publications and add to the profile of ICIMOD's scientific community. Additional sections to the website to communicate with audiences not currently part of ICIMOD's user base could also be considered. Complementing this will be a great emphasis on social media to take advantage of its speed and spread as well as to address a newer and younger demographic that tends to populate this environment.

Some of the key elements of ICIMOD's publishing and communication strategy include:

- Consolidating and increasing HKH profile in all the traditional media through select activities that include: an annual regional editors and columnists conference on HKH; regular feed from ICIMOD research to a panel of print media and online columnists in each RMC to give more emphasis to HKH in their writings; periodic text and visual feed to focal persons in each RMC; TV channels for greater coverage; working with radio stations to create HKH programming with more localised applied content;
- Developing complementary microsites for the themes and initiatives to give their research output more public visibility;
- Creating more animated and interactive content for a section of the website geared to young people;
- Translating more of ICIMOD's research into infographics for ease of comprehension among the lay audience;
- Organizing HKH and environmental knowledge events in schools and colleges;
- Developing cohesive messages and consolidating and 'translating' them for different audiences;
- Translation of publications into national or local languages – particularly for training materials and awareness raising materials – through collaboration with partners;
- Exploring innovative ways of packaging knowledge for impact at policy-making level;
- Enhanced use of images (photos and graphics) and electronic publishing options (e.g., interactive e-books, and presentation of information creatively through the website rather than as a print publication);
- Promoting uptake through more strategic, proactive, and creative means of dissemination – including face-to-face briefings, soliciting feedback, and use of blogs and Tweets;
- Publicizing partner publications and adapting them for new audiences;
- Securing the support of well-known personalities to lend support to ICIMOD knowledge activities and products by serving as brand ambassadors;
- Increasing the scope of events at ICIMOD and in member countries for the public and for specialized audiences (celebration of international days, open house) and using brand ambassadors to publicize such events;
- Increasing participation in partner events in the region and beyond (e.g., booths at high-profile meetings, photo exhibits) also using brand ambassadors to improve visibility; and
- Increasing and publicizing ICIMOD's virtual events, such as forums with virtual linkages to partners in other locations.

8.4 KMC Working with Themes, RPs, and Initiatives

In MTAP-IV, KMC will orient its core competencies to a specified set of crosscutting knowledge management and communication objectives and develop focused capacity in science communication. Some of these objectives are internal while others link the internal with the external through sharing and outreach activities. The proposed objectives are outlined below.

KMC will continue its pan-institutional role within the matrix system, working closely with ICIMOD's Themes, Programmes, and Initiatives to:

- Ensure smooth internal communication;
- Ensure timely availability of high quality information;

- Ensure co-ordination through assigning KMC focal persons;
- Provide platforms for data, information, and knowledge sharing;
- Enable logistical and service-delivery assistance;
- Provide expertise in streamlining throughput and editing output to maintain high quality of knowledge products;
- Work with researchers to create user-friendly, non-technical derivative products (blogs, podcasts, videos, animations, infographics, microsites);
- Provide design and layout services for final knowledge output; and
- Provide outreach facilities to increase uptake among different kinds of audiences.

KMC's institutional role

- KMC's will also continue to apply its core competencies to:
- Support the DG, Directorate and SMC;
- Extract key messaging across the institution;
- Ensure the highest quality of institutional documents;
- Develop materials for key meetings;
- Take leadership for annual institutional events such as international days;
- Coordinate all media-related interactions including interviews, press conferences, media workshops and advisories;
- Anchor internal communication platforms such as the intranet and knowledge sharing events such as internal and guest talk series.

Based on these actions above, KMC will assess its success through the following:

- Contribution of knowledge products, including scientific papers and policy briefs, to regional and global coverage, policy decisions and behaviour change;
- Effective documentation and communication of impact stories;
- More attention of mountain issues in the public domain and international processes; and
- Emergence of new actors, including networks, engaged in promoting sustainable mountain development.

9. Partnerships

9.1 Introduction

Partnerships form the core of ICIMOD, having a unique mandate and convening power that brings together regional governments, public sector agencies, NGOs and community based organizations, research and academia, civil society and the private sector. Effective Partnerships is central to ICIMOD for the effective and efficient implementation of its programmes. It is based on systematic and coherent engagement with a diverse network of partners from the region and beyond. In essence, effective partnerships bring unique opportunity and position to ICIMOD.

As ICIMOD is transitioning into MTAP-IV (2018–22) with a strategic focus on regional cooperation, we continually strives to strengthen partnerships for increased developmental impacts and ownership by the RMCs. As a learning organization, ICIMOD builds upon the strength of existing partnerships at the same time tapping into emerging partnership opportunities to provide much needed strategic orientation and direction for the MTAP-IV implementation. The sections below describe key aspects of partnership development and management for the implementation of MTAP-IV.

9.2 Typology of Partnerships

ICIMOD has been working with and through an extended and diversified network of partner organisations at national, regional, and international levels (Figure 9.1). As a multi-disciplinary knowledge and learning center, it is inherent that ICIMOD interfaces with a wide network of partners in the region for its diverse programme portfolio. These partners include government agencies, regional and international organisations, non-government organisations, development agencies, research

Partnerships for Research-Innovation-Knowledge-Policy

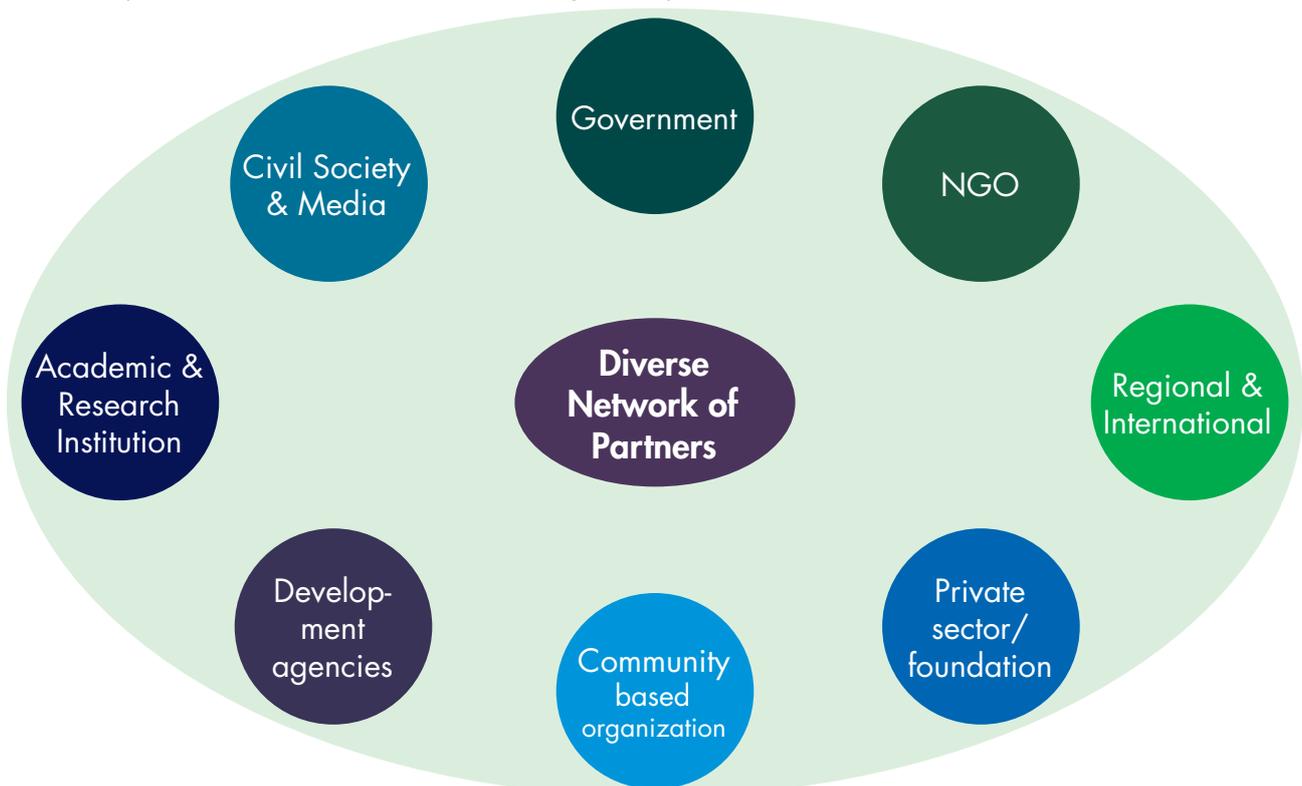


Figure 9.1: Diverse network of partners

and academic institutions, community based organisations, civil society, media firms, private sector and philanthropic foundations. ICIMOD's works cover a wide spectrum of activities ranging from – action research linking to development; innovative solutions and use of technology; community level engagement to policies at the national and regional level and advocating mountain agenda in global platforms.

From the broad range of partners landscape that are needed to meet its objectives, ICIMOD has defined broadly four types of partnerships such as:

Strategic and policy partners - These partnerships support development and formulation of mountain-specific strategies, policies and legislation. They help facilitate and conduct policy reviews and assessments, catalyze the upscaling of solutions to the policy level, and shape policy agendas.

Implementation partners - These partners include operational and research partners who support regional programme implementation either individually in the RMCs or through the consortium of partners.

Development partners - Development partners include bilateral and multilateral international development funding partners in the frame of both financial and technical cooperation.

Knowledge partners and networks - These partnerships are comprised of universities and academic institutions; regional and global network organizations; science partners and thematic networks; and institutions engaged in advocacy, outreach, knowledge sharing and exchange and dissemination, including media organizations and publication houses.

The apex level of partnership for ICIMOD is its member countries and nodal agencies representing in the Board of Governors – providing strategic direction and guidance to ICIMOD. ICIMOD will continue to work with its nodal Ministries to improve its working modalities and reach out to the network of partners in each member country. ICIMOD will work with strategy and policy partners to support the development and formulation of mountain-specific development strategies, policies and legislation. Through programmatic interventions, these partners help facilitate and conduct policy reviews and assessments, catalyse scaling-up of solutions to the policy level and shape policy agendas. Strategic and policy partners may also influence ICIMOD's programmes and help promote the mountain development agenda on the global stage. These key partners include nodal ministries, national and regional organizations, and global partners.

9.3 Regional and Global Partnerships

The global processes such as UN-SDG, Paris CC and Sendai Framework have special significance to the HKH region. As a regional, intergovernmental organization, ICIMOD will continue to engage with key global processes such as the UNFCCC's COP meetings; the Sendai Framework for DRR, Global Earth Observation (GEO), the UN-SDGs, the Convention of Biological Diversity (CBD), the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), and the ILO. ICIMOD will strengthen strategic partnerships with UNEP, IUCN, WMO, TPE, CTCN, TROSA of Oxfam and others to push the common mountain agenda forward to the forefront of the sustainable development discourse. and encourage investments in sustainable development of the HKH region through global financing instruments such as GCF. In addition, ICIMOD will focus on building partnerships with regional and global organisations such as Mountain Partnership and other networks in line of its various programme portfolios to advocate mountain agenda and voice.

ICIMOD will promote the HKH Partnership for Sustainable Mountain Development which was launched on the occasion of the Second United Nations Environmental Assembly (UNEA-2) to foster regional solidarity and cooperation. ICIMOD will work with its Nodal Ministries to bring together environment Ministries to raise the mountain voice and agenda in the regional and global discourse especially in the

context of post UN-SDGs, Paris Climate Agreement and Sendai DRR framework. In addition, ICIMOD will focus on building partnerships aligning with its strategic orientation and priorities. Most important ones are:

- Himalayan Science-Policy Dialogue – a second track policy dialogue for regional cooperation in the HKH
- Climate change adaptation – global and regional networks supporting adaptation practices
- Transboundary landscapes – network of conservation and development in landscapes
- Transboundary river basin – river basin network to foster cooperation of selected RMCs
- Cryosphere networks – promoting cryosphere research and knowledge sharing
- Climate and clean air network – global alliance of air pollution network
- Himalayan GEOSS – promoting the use of earth observation through regional collaboration
- Disaster risk reduction – network of disaster management agencies
- Himalayan University Consortium – a network of Universities promoting mountain research

9.4 Strengthening Partnerships Management for the MTAP Implementation

Partnership as a service

Based on past experiences and lessons learned, ICIMOD will position itself in providing partnership services within ICIMOD and with ICIMOD partners as one of the key pillars for overall operations as well as to support strategic planning and decision-making. ICIMOD will continue to build up and ensure sound partnership management tools and processes for efficient and effective programme operations. To this end, role and function of the SCU will be further strengthened to provide partnership services across the institution. To address the increasing portfolio of partners and to systematize the process of partnership management, the Partnership Manual has been developed. The Manual is a living document and serves as internal guidelines and procedures for managing all partnership related instruments to be followed at the institutional level with clear-cut procedures, workflow and approval process. The Manual provides various partnership instruments to formalize relationships between ICIMOD and its partners based on the typology of partnerships. In addition, ICIMOD engages with a significant number of organizations in the region and beyond for capacity building and networking, community of practice, knowledge sharing, dissemination and exchange. ICIMOD's approach to partnership is based on the internationally recognized Partnership Brokers Association (PBA).

Implementing partnering approach

ICIMOD will imbed the **Partnering Approach** at all levels institutionally to provide the basis of programme operations for delivering impacts, manage partner relationships and minimize institutional risks. The partnering approach is grounded in the five key Partnership Principles of diversity, equity, transparency, mutual benefit and synergy. The partnering approach is built on the foundation of ICIMOD's network and evolving programmes, practice-based learning and knowledge on sustainable development projects and programmes from the region. In the MTAP-IV, ICIMOD will continue to apply the fundamental principles of the partnership approach to all its partner relationships, and aim to help improve partner relations and programmatic outcomes.

Partnering approach will not only focus on the agreed activities but also on enhancing the practices at ICIMOD to jointly work with partners to add value to the partnerships. These include scoping and building of new partnerships for the relevant activities in order to establish successful partnerships. For the existing partnerships, deepening organizational arrangements for the managing and maintaining of the partnerships will be a priority. 'Health checks' as the review of the relationships with partnerships will be undertaken to make necessary revisions, as and when required. An important consideration will be the sustaining outcomes towards the closure of the partnerships and moving beyond the current engagement.

The partnering cycle

ICIMOD will follow the partnership cycle (Figure 9.2), which is a step-by-step process describing the series of guidelines and procedures for developing and managing partnerships. ICIMOD will adopt the Partnership Cycle at the Initiative level and the partners of strategic importance. The Initiative is a building block of ICIMOD's programme activities that brings together partners from multiple regional member countries, multi-year programme implementation, and often supported by more than one development partners. ICIMOD adopts an integrated approach for programme implementation that includes – partnership brokering, impact pathways, communication and outreach and financial management at the initiative level.

ICIMOD will follow the partnership cycle which serves as customized guidelines to help improve partner relationships and programme outcomes and to make greater developmental impact of its activities with the partners. The cycle consists of four key stages of building an effective partnership:

- Scoping and building;
- Managing and maintaining;
- Reviewing and revising; and
- Sustaining outcomes.

Scoping and building

The scoping and building consists of partner selection, conducting due diligence and creating partner profile, which are briefly described below:

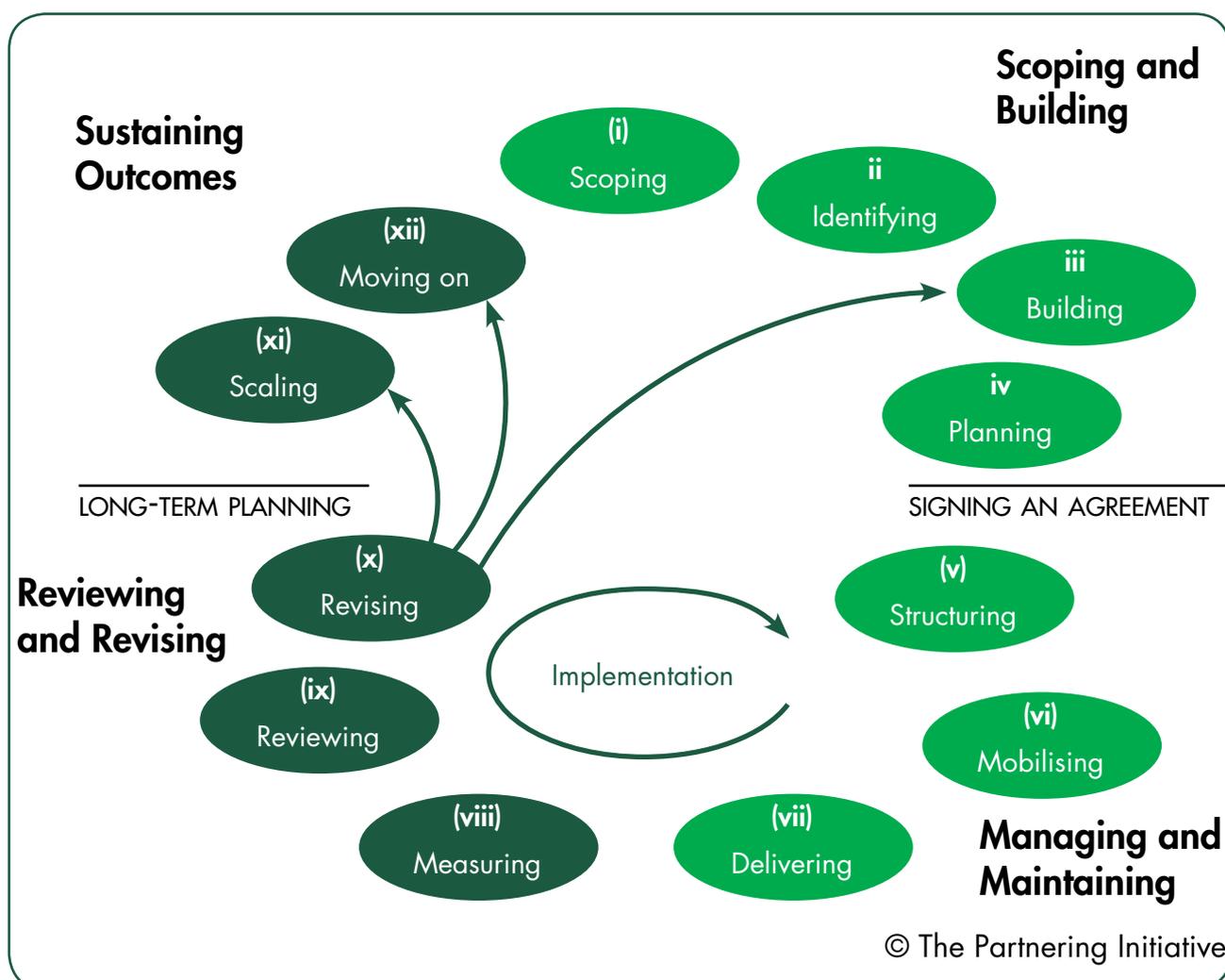


Figure 9.2: Partnership cycle

Partner Selection: The ‘right and fit-for purpose partner’ is key to the impact of the activities of ICIMOD. ICIMOD will introduce a comprehensive methods for exploring and assessing organizations as a potential partner. The PRM System provides access to the partner database to get updated information on ICIMOD’s existing partners with their general information, areas of work and expertise and other relevant information that would help to identify a pool of potential partners. Stakeholder mapping is yet another method to identify potential partners from a broad spectrum of stakeholders. In general, stakeholder mapping workshops in the respective RMCs will be conducted at the time of launching of the new initiative or at ICIMOD at the regional level. As part of the process to identify and select suitable partners, there is possibility of making a public announcement such as Expression of Interest (EOI) call. Another method is a grant call which is basically an open competition call for a particular assignment with a proposal for a certain amount of grant for a fixed period of time.

Partner Due Diligence: Every new implementing partner has to undergo a due diligence assessment process. Due diligence is a key risk-management step. The process involves a comprehensive process where organisations as potential partners are evaluated under specific criteria for the selection of the appropriate partnership. The due diligence is a holistic approach that not only exclusively focuses on financial aspects, but also focuses on other compatibility factors such as the professional competencies, project management, monitoring and evaluation, governance and gender equality. The process will be followed for all existing and new partnership development in the MTAP-IV. It involves finding and verifying as much relevant information about the potential partner before ICIMOD enters into a partnership. The due diligence process helps ensure that ICIMOD makes an informed decision and that the information provided by the partners is accurate and meets ICIMOD’s standards. It can help evaluate whether a particular organization is suitable for a partnership with ICIMOD and whether the partnership will contribute to ICIMOD’s objectives and reputation. As some ICIMOD partners are identified by the nodal ministries or government agencies in the RMCs, the due diligence process can be flexible on a case-by-case basis.

Partnership profile: ICIMOD has prepared a profile of each partner organisation along with partnership information of all typology of partnerships. Such compilation of information of the partner organisations will be useful for mapping partnerships, better coordination in programme implementation, maintaining track-record of the partners, assessing their competencies and relevance, planning, future communication and exploring partner organisations to establish future partnerships. Detail information of the profile and partnership information have been integrated in the PRM system so that the system serves as a repository of important partner information. Partnership profiles are easily found along with search options for all partnership typologies. Multiple filters can be used to retrieve specific information of interest about partners. Partner profile can be searched by country, regional programme, initiative, typology of partner and free text.

Managing and maintaining

The managing and maintaining stage of partnership cycle consists of partnership capacity building, effective use of PRM system to manage and maintain partnerships and partnership reporting, which is described below:

Partnership Capacity Building: Target capacity building will be undertaken for the Initiative/Regional Programmes as well as to the programme partners. Orientation of the partnering approach and integration at the initiative level will be the key to successful partnerships. Since each partnership at the initiative is unique in their own way, it is important to understand the partnership on individual basis. The capacity building activities helps to embed the partnering approach and culture for the efficiency and effectiveness of the programme activities. ICIMOD in collaboration with PBA will hold accredited partnership training in regular basis in cost-recovery mode. In addition, specific capacity buildings to the partners will be carried out on gender, financial management, monitoring and reporting.

Partnership Relationship Management (PRM) System: The main objective of the PRM System is to provide decision support tools at multiple levels for operational and strategic planning and decision making for partnership management. The system consolidates the center-wide data and information on partnership agreements, provides easy to use tools and reporting system for the programmes. In MTAP-IV, the PRM System will be further upgraded with additional features and modules such as online M&E system, online agreement processing system. The online agreement processing system provides a robust, standardized system for quickly developing a partnership instrument with a partner that is in compliance with institutional procedures.

Partnership Reporting: Partnership Reports at regional member country, regional programme, and initiative levels will be generated on demand or coinciding with the internal review cycle. As part of the partnering approach, generating uniform partnership reporting at the institutional level serves as guidelines to continually improve partner relationships and overcome implementation challenges. These reports generated include an overall status of partnerships with updated facts and figures, partnership highlights, and the status of ongoing and completed partnerships with graphic illustrations. The reports can be generated with multiple search combinations and can be customized to suit the users' objective. Also, partnership report will be generated.

Reviewing and revising

The reviewing and revising stage of partnership cycle consists of partnership health-check which is described below:

Partnership Health-Check: One of the important step in partnership management cycle is partnership health-check. In continuing with the efforts to manage partnerships effectively and to receive constructive feedback on the partnerships, health-checks as a preventive approach to review the partnership. Through a partnership review health-check, ICIMOD reviews partnerships in case-by-case basis to evaluate both the retrospective and perspective context of the partnership. This process helps to reflect upon the overall partnership of the Initiative or Partner to provide the way forward with the key opportunity to discuss and resolve any partnerships issues. Health-checks also helps to look at the benefits and costs of being involved in the partnership, and what can be changed to make it more effective and efficient.

Sustaining outcomes

The sustaining outcomes stage of partnership cycle consists of partnership close-out and partner advisory, which is described below:

Partnership Close-out: Partnership agreement close out is an important step of the partnership cycle as it defines a formal process for the closure of completed partnership agreements with the core objective to maintain a good relationship with the partners for future prospects. It is an opportunity for partnership peer review to decide issues around the next steps. This process takes into considerations an exit strategy and the options to be undertaken and followed in line with the partnering approach. This includes partners taking the effort to discuss the next steps, agree on the way forward and how this will be communicated externally and how experiences and learning will be shared. If the partnership has been successful and goals have been achieved, this stage of the partnership cycle considers what must be done to sustain the partnership.

Partner Advisory: As part of partnership development, the Partner Advisor will be introduced in MTAP-IV. The Partner Advisor will help to periodically review each partnership based on their performance. Each partnership will be rated on a scale from 1 to 5 and stars will be assigned to mark the overall status of partnerships with that partner. This review will be done peer-to-peer basis, where partner also has ability to review the partnership with ICIMOD. The purpose of this advisory is to help provide a review across the spectrum of these partnership areas by ICIMOD and partner itself, which can help identify the strategic value of their partnerships; which partnerships should be further strengthened and which should be closed; and any gaps where new partnerships need to be developed.

10. Private Sector Engagement

ICIMOD has developed a comprehensive Private Sector Engagement (PSE) strategy to foster closer collaboration with the private sector. The Strategy marks the institutional priority for strengthening partnerships with the private sector on a broad range of Centre's priorities and programmes and demonstrates its commitment to working hand-in-hand with the private sector. The PSE provides a roadmap to augment engagement with the private sector wherein the private sector is a key partner to complement the efforts of ICIMOD by offering unique skills, knowledge, expertise, and resources to achieve mutual objectives and contribute to sustainable mountain development. Also, the PSE aims to maximize synergy with development partners having private sector portfolio, philanthropic foundations, and corporate social responsibility agencies.

ICIMOD is cognizant that the private sector is a valuable partner for increased development impact, up-scaling potentials and longer-term sustainability of its activities and the successful implementation of the PSE will require institutional change and innovation at ICIMOD. Building on positive experiences and capitalizing on emerging regional and global momentum, ICIMOD will focus on developing mutually beneficial partnerships with the private sector aligning with its strategic and programmatic priorities, facilitating regional learnings and enabling conducive policy environments and expanding the private sector network in the region and beyond for investment opportunities in sustainable mountain development.

10.1 Private Sector as a Partner for Sustainable Mountain Development

Engagement in ICIMOD's regional programmes

ICIMOD's regional programmes have the potentials for private sector engagement and can benefit from increasing interests of private sector by pooling the private sector's capital, human and technology resources. Bringing new technology and innovation are yet another element where private sector adds value to the regional programmes. Another related approach is engaging the private sector actors implementing large projects who wish to understand their impact on the region, and seek ways to offset environmental impacts while providing benefits to local communities. ICIMOD will focus on collaborative research, customizing innovation for mountain specific situation and providing technological solutions to foster mutually beneficial partnerships with the relevant private sector in the areas of regional programmes. ICIMOD will carry out systematic mapping and scoping out the areas of cooperation where the private sector could be engaged with and identify the low hanging fruits for mutually beneficial partnerships.

Up-scaling and Out-scaling ICIMOD's work

Developing knowledge through ICIMOD's action research, pilot and demonstration and translating them into a viable business solution will be a key approach to up-scale and out-scale ICIMOD's works with the private sector. Specific focus will be made in formulating research topics with the involvement of the private sector actors in mutual areas of interest from the beginning, looking into sustainable business solutions and up-scaling potentials. ICIMOD will focus on developing mountain enterprises by unlocking innovative livelihood opportunities, market driven solutions and promoting more equitable approaches to sustainable development. Empowering women and youth and linking them with finances, insurances, markets and skills and entrepreneurship development will be key aspects in developing mountain enterprises. Specific focus will be made wherein the private sector can scale up activities of the on-going livelihood initiatives, adding more local value, diversification into higher-value products, development of

facilities for mountain entrepreneurs, quality management and green business opportunities. In addition, ICIMOD can contribute its experience and knowledge to the private sector for business development planning by sharing its expertise and knowledge resources.

10.2 Facilitate regional learning and enable conducive policy environment

Regional Platform for Businesses

The private sector is the main driver of economic growth and it represents one of the main sources of employment generations in most of the RMCs. There is increasing signs of investments from the RMCs and regional cooperation and integration on energy, trade and connectivity. ICIMOD sees the opportunity to engage in regional dialogue and bring mountain perspective and agenda especially those having regional significance. As a regional intergovernmental organization, ICIMOD can provide a regional platform among the public sector, development actors and private sector for mutual learning and sharing opportunities and foster regional cooperation on business partnerships for sustainable mountain development. ICIMOD will act as a hub for best practices of business partnerships and fostering cross-linkages and cross-learnings among the regional member countries, such as organizing a regional CEO forum.

Enable Policy Environment for private sector development

One of the key impediments of private sector engagement in the region is due to lack of appropriate policy framework for private sector development and public-private partnership. ICIMOD can facilitate dialogue between government agencies and businesses, especially in contributing to understand what policies are causing these barriers and to work closely with the government agencies and the private sector to bridge these gaps. ICIMOD will promote policy dialogue and identify the regulatory framework bottlenecks and work towards private sector development policy reforms.

10.3 Expanding Private Sector Network and Investment in Mountain Agenda

Networking with Apex Business Entities

Building on past, ICIMOD will continue to establish and strengthen partnerships with the national and regional federations of chambers of commerce and industries to reach out to the relevant private sector and expand its private sector network. As a knowledge organization, raising awareness and building the capacity of the private sector about the larger environmental challenges and impacts of climate change on their businesses, sustainability reporting for businesses will be of ICIMOD's interest. ICIMOD will position itself to repackage and translate the existing knowledge that is understandable and useable for the private sector network to help progress business development opportunities in the mountain areas.

Investment in Mountain Agenda

Safeguarding mountain goods and services is vital for businesses and broader sustainability. In addition, the SDGs bring a new vision focusing on promoting proactive engagement of the private sector. With a strong focus on contributing to the SDGs, ICIMOD promotes inclusive and sustainable market solutions and innovations to find effective development solutions with the private sector. ICIMOD has a interest in providing avenues for private sector investment in the mountain development agenda, particularly those whose operations rely on natural resources from the HKH mountain regions. The approach is to engage the private sector to develop relevant programme focusing on global priorities for the mountains. ICIMOD will develop partnerships aligning with the priorities of development partners and new financing instruments such as GCF-Private Sector Facility. In particular, ICIMOD will seek the opportunity to catalyze multi-stakeholder partnerships to address the SDGs and encourage private sector entities to invest in mountain development agenda as a business opportunity.

10.4 Rules of Engagement

The rules of engagement is to establish long-term partnerships with the private sector in supporting ICIMOD's mission. For this, several institutional measures will be undertaken to better position and strengthen its capacity to engage with the private sector. The important ones are:

Support ICIMOD's Strategic Framework: ICIMOD will target and give priority to those activities with the private sector that fits within ICIMOD's Strategic Framework and complements the work. Projects that add value to the work that will result greater development impact, up-scaling potential and sustainability will be the primary focus.

Contribute to ICIMOD's impact pathways: The impact pathways and results chain are guided by the Centre's vision of a healthy mountain environment and improved wellbeing for mountain people. For the private sector engagement activities, ICIMOD will ensure that the partnership is initiated from the initial stage of the development of the activities and that the private sector's role within the impact pathways of the Regional Programmes is clearly defined. Thus, the private sector partnerships will be in line with the programme's goals and outcomes and contributes to the strategic goals that will ultimately help create strategic impacts to support ICIMOD's overall objectives.

Share joint knowledge generated: ICIMOD as a learning and knowledge sharing organization in the region, encourages and fosters collaborations with partners including the private sector to share and exchange knowledge and best practices. For ICIMOD, knowledge is a public good commodity and thus, the information and knowledge would be shared according to ICIMOD's data sharing policy as well as the intellectual property rights

Safeguard institutional reputation: In order to minimize risks to ICIMOD's reputation and safeguard ICIMOD's interests, private sector partners must be assessed according to due diligence process and the guidelines for partner selection. ICIMOD will avoid any partnerships whose primary objective is co-branding in order to enhance its own visibility only or the actors having agenda for greenwashing.

Restriction on type of organisation to engagement: ICIMOD will restrict on the type of organisations following the overall UN value framework for selecting private sector partners. ICIMOD will refer to the 10 principles of the UN Global Compact. These principles provides ICIMOD with a reliable and universally accepted point of reference in developing its own guidelines for choosing private sector partners. Examples of some organisations which ICIMOD will not engage will include those that deal with manufacturing of weapons, alcohol and the use of child labour among others.

10.5 Institutional Arrangement within ICIMOD

The private sector is comprised of businesses and organizations with a wide range of scope and scale. For this reason, ICIMOD will take a flexible approach to engaging the unique typology of private sector groups at the national, regional, and global levels. ICIMOD will work towards ensuring that the private sector understands value proposition of ICIMOD and provide opportunity for win-win partnerships

As part of the institutional arrangement for private sector engagement activities, ICIMOD's Director of Strategic Cooperation and the Strategic Cooperation Unit (SCU) will serve as focal point for facilitating linkages between the private sector and ICIMOD's programmes and initiatives. While, regional programmes will largely work with private sector, SCU actively facilitates partnership-building at the institutional level.

SCU to work with Regional Programmes: The SCU will work closely with the various Regional Programmes at ICIMOD to map out, scope and identify private sector organisations who contribute to ICIMOD

activities. The key areas of focus while considering partnership will include: alignment with ICIMOD's mission; value for money; impact on the ground and ability to upscale and innovate.

SCU to support the Director General on fundraising: As part of the institutional efforts to explore private sector for fundraising particularly the foundations, SCU will provide the necessary support to the Director General. The support include business intelligence, background information of the potential relevant foundations, identify the relevant foundations, set up meeting and follow up actions.

SCU to promote partnership approach: ICIMOD will position itself for increased visibility to the private sector as a valuable partner to complement mutual objectives. The partnering approach will be applied to the private sector partners to co-create and co-design programmes in line with the mountain development priorities. Engaging the private sector requires a better understanding of why to partner with a particular group, and how to design that partnership to deliver effective results and mutual benefits.

11. Delivering Institutional Development

In this section, we present ICIMOD’s organizational and management structures with special attention to human resources and development, gender responsiveness, and environmental planning.

11.1 ICIMOD’s Organizational and Management Structure

Management structure

ICIMOD executive management is comprised of the Director General (DG), the chief executive of the organisation, supported by the Deputy Director General, Director Finance Administration, and Director Strategic Cooperation. The DG is further supported by Knowledge Management and Communications (KMC), and Strategic Planning Monitoring and Evaluation (SPME) (See Figure 11.1).

The DG with the Directors and three unit heads comprise the senior management committee (SMC), which is the highest decision making body of the organization. The DG convenes the SMC meeting weekly.

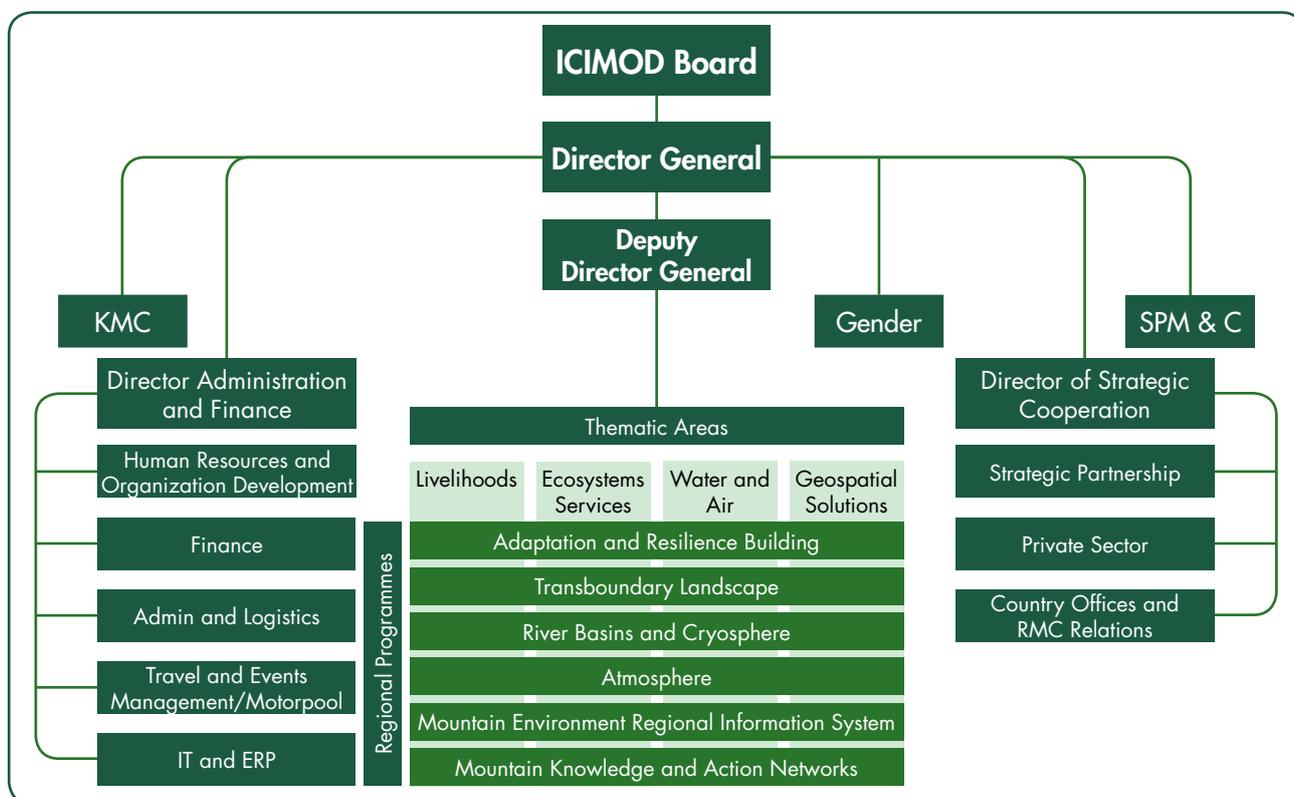


Figure 11.1: **Organogram**

Three additional ICIMOD committees provide space for discussion:

- **Management Committee (MC)**. This forum convenes the SMC, themes, initiatives, the chief scientist, the chief policy advisor, regional programmes, unit heads, and strategic institutional functions.
- **Programme Management Committee (PMC)** This forum is comprised of all SMC members, programme managers, theme leaders and chief scientists to discuss programmatic issues.
- **Finance and Administration Committee** convenes all unit heads of the finance and administration department and reviews work and planning for improved service delivery.

Strengthening our matrix management

During the MTAP-III period ICIMOD’s organizational structure was aligned in a matrix structure to facilitate multidisciplinary integration for delivering impact through Regional Programmes. Through

a high level of interaction within and across departments, the matrix was expected to strengthen cross-organizational cooperation, make ICIMOD more responsive to the needs and demands of its stakeholders and partner organizations, and enhance results and impact orientation. We consider the matrix structure to be largely a success during MTAP-III, and we seek to optimize it further during MTAP-IV by focusing on the following points:

- Ensuring proper introduction and explanation of the matrix to new staff so that all ICIMOD staff appreciate the benefits of the system and recognize that organizational effectiveness demands personal investment and commitment to clear and open communication across teams, especially between themes, programmes and KMC.
- Building and improving our research, science, and intellectual leadership in developing programmes within our structural matrix. Theme Leaders are responsible for allocating staff to the RPs, ensuring that the level of applied research is adequate, supporting staff in their personal development, and assessing performance. The RPs are responsible for overseeing the programmes/initiatives, coordinating the work, and ensuring that the work results in impact. In this way, ICIMOD Themes and Regional Programmes go hand in hand, delivering “science for impact” through effective coordination and communication.

The four pillars of institutional development

The following four institutional functions provide support for the effective and efficient implementation of the ICIMOD’s programmes and projects.

Pillar I – Finance and Administration

The Finance and Administration team is largest in the organization in terms of staff size, including all personnel from finance, procurement, security, housekeeping, maintenance, travel and hospitality, information technology, and human resources.

The Finance Committee of the Board of Governors oversees the overall financial and administrative performance of the centre. The committee provides guidance and instructions to the Director General and the Director Finance on matters relating to financial management, as needed. ICIMOD has implemented an Enterprise Resource Planning (ERP) system that integrates all functions in one central database. This provides real-time information for management decision making (e.g., budgets, partner organization financial performance). The ICIMOD financial management system functions in a robust internal control environment that ensures value consciousness, economy in inputs, and strong cost control measures.

Pillar II – Partnership Management

ICIMOD has adopted a partnership approach for programme implementation. In cooperation with our Regional Programmes, our Strategic Cooperation Unit (SCU) builds on the foundation of ICIMOD’s network, practice-based learning, knowledge on sustainable development projects, and model programmes around the world. This approach seeks to replace more traditional contract-management approaches while maintaining accountability, transparency, and fiscal responsibility. ICIMOD founds its partnering approach upon the principles of equity, transparency, diversity, and mutual benefits. Per our board-approved strategy, SCU has adopted a partnership manual for workflows, guidelines, and for managing all forms of partnerships.

Pillar III – Strategic Planning Monitoring and Evaluation

The Strategic Planning, Monitoring, and Evaluation Unit (SPME) strategically supports and advice the Centre in becoming more results oriented and to improve its focus on outcomes and impacts. The

SPM&E works enhancing its results-based planning, monitoring and evaluation at all levels institutional, programmatic, and partner's level. It also coordinates ICIMOD's planning process, review, and reporting. SPME serves as the focal point for project cycle management with support from those in charge of strategic institutional functions. SPME aims to strengthen its impact measuring capacities and focus on preparation of reports, documenting outcomes stories, internal evaluations, facilitating external reviews and rigorous impact assessments.

Pillar IV – Knowledge Management and Communication

Knowledge Management and Communication (KMC) serves both corporate and programmatic functions at ICIMOD. KMC supports programmatic work to enhance results through dissemination of ICIMOD-produced information. In this way, KMC is responsible for shaping how the Centre is portrayed to the larger community.

11.2 Human Resources and Capacity Building

Strategic and operational level

In the next five years, Human Resources will support the organization by delivering impact at two levels: strategic and operational.

At the strategic level ICIMOD will continue to seek the most qualified staff while retaining and sharpening the skills of current personnel in the existing themes and programmes across our institution. In addition, as new programmes emerge, we will focus on acquiring and embedding the skills required to support that work. Staff planning will be done adaptively year by year, depending on the increase of work in the Regional Programmes and the new ideas and innovations requested from our Themes. As before, we will also retain a necessary flexibility for work requirements by maintain special service agreement consultants for short- and medium-term assignments.

We will strengthen our Job House (currently referred to as “Job Classification) by providing in detail the requirements and competencies per position, which will be the basis for recruitment, performance appraisal, individual development, career growth, and career planning.

Depending on the size of the Themes, ICIMOD will appoint sub-thematic supervisors to serve under the Theme Leaders. This adaption measure was introduced in 2015 for the Livelihoods theme. This will reduce the span of control of the Theme Leader while improving the supervision and guidance of (especially younger) staff across our Themes.

ICIMOD strives to remain a competitive employer in the market with a fair, equal, and competitive compensation and benefits package to attract professionals from all Regional Member Countries (RMCs) and from outside the RMCs in order to have a wide range of skills, competencies, and cultures in the organization.

ICIMOD strives for the improved well-being of mountain people in a healthy mountain environment. Similarly, ICIMOD's HR is committed to creating a healthy environment for staff well-being. The Wellness Programme at ICIMOD, started in 2016, arose in the aftermath of the Nepal 2015 Earthquake. It became apparent at that time that ICIMOD employees and the communities it served required assistance beyond material assistance. HR initiated a wellness programme to attend to mental health and physical well-being.

At the operational level, HR will focus on getting the “basics right” and act as service provider to all levels in the organization. HR relies on efficient use of both the ERP and online Performance Management Systems (“Management by Objectives” – MBO) as well as ICIMOD's online application system and the

consultancy roster. HR will support management decisions and choices by providing informed reports compiled by analyzing human resource data over time.

HR's main areas (Recruitment and Selection, Human Resources Development, Compensation and Benefits, and Health and Safety) are established and operational. For the MTAP-IV period, HR will continue to strengthen its service delivery, responsiveness, and learning.

Staff development and capacity building

ICIMOD's unique position as an intergovernmental knowledge, learning and enabling centre provides significant opportunities for staff to learn and develop their professional experience by extending their skills in knowledge creation and innovation.

Staff trainings and development often reflect organizational or individually-expressed needs of our personnel, derived from our annual staff talks and regular staff meetings. HR will design and provide in-house trainings as needed.

HR will support management at different levels to stimulate and nurture the proper learning environment for their teams and departments so that staff can mature and learn different ways (e.g., formal trainings, team trainings, conferences). In this way, we work to develop staff who are confident to speak up, learn from mistakes, and provide constructive feedback to each other.

HR will design a structured but simple mentorship system to help establish open communication processes and put feedback loops in place. During the next MTAP period, efforts will be made to identify mentors for young staff when they are recruited. At the very top level of the organization, senior management will mentor potential female leaders to improve the representation in senior leadership positions.

Career development of staff is supported by our annual staff talks with use of our Management by Objectives system (MbO). MbO provides distinct and measurable markers by which staff and management can assess performance while providing support to areas that need it.

Recruitment and selection

ICIMOD will continue with its rigorous selection process, by vetting a carefully selected panel with leadership from the Directorate. This step is followed by the selection of primary candidates via Skype and face-to-face interviews. We will maintain a continued focus on attracting staff from underrepresented RMCs such as Afghanistan and Myanmar and female staff from Bangladesh, Bhutan, China, and Pakistan.

ICIMOD initiated a PhD fellowship programme in 2016, with the hope of cultivating future staff and generating quality scientists for the region. ICIMOD also provides professional development opportunities to its RMCs through a visiting scholar programme (currently from China), post-doctoral posts, visiting scientists, and young professional exchanges. HR will work with the Himalayan University Consortium to establish a trainee programme for students from the HUC universities.

HR will strengthen its consultancy roster in the next five years by developing a system to evaluate the existing consultants on the list to ensure that we maintain relationships with consultants who have the proper level and blend of skills, experience, and knowledge.

Performance appraisal

ICIMOD's MbO system will remain the vehicle through which supervisors set annual objectives for staff from the perspectives of Themes and Regional Programmes. In 2017, ICIMOD introduced "Institutional

Objectives for Strategic Orientation,” an annual exercise in which staff document their contribution toward various institutional objectives such as gender equality, interdisciplinary teamwork, result-based performance and policy engagement.

HR will support managers in assessing the performance of staff in a critical, positive way to optimize their performance and job satisfaction.

Health and safety

Staff safety and security

ICIMOD is committed to providing a safe, healthy, and secure environment for all its employees, visitors, and partners. To help achieve and maintain such an environment, comprehensive safety and security plans and programmes will be maintained.

The evolving nature of risk will require an institution-wide approach to safety and security by enhancing the well-being of all employees who are increasingly exposed to risk in the conduct of their work. HR will seek to improve its understanding of perceived risk by including a section on Health and Safety in the proposed staff satisfaction survey.

ICIMOD will promote and institute risk mitigation and reduction by establishing a Focal Security Office (FSO) within the Centre’s premises. Key security and safety messages and policies will continue to be a regular item in staff inductions.

ICIMOD takes all reasonable measures to prevent life-safety incidents and risks to the safety and security of employees and property.

Wellness programme

ICIMOD’s wellness programme (e.g., two-yearly health checks, relaxation/yoga sessions, talks on health related issues/leisure activities, stress management, and individual counselling) is designed to encourage and support employees (and occasionally their families) to adopt behaviors that improve their quality of life, reduce health risks, increase personal effectiveness, and serve the organization as a whole. Every two years, HR will conduct a satisfaction survey that incorporates questions to establish a “Happiness Index.”

11.3 Increasing Gender Responsiveness

For the MTAP-IV, improving its responsiveness to gender issues and working toward gender quality will be a high priority for ICIMOD. Enhancing and strengthening its organizational ability to implement gender mainstreaming in its policies, programmes, and structures will be the major approach adopted for ensuring that all levels of the institution reflect enhanced awareness of and sensitivity to gender issues.

We will adopt a series of actions in support of this goal⁸:

- Ensure that human resources policies are gender sensitive and gender responsive;
- Set up a baseline of performance on gender mainstreaming in the organization;
- Identify benchmarks by which to assess our success in promoting gender equality;
- Build organizational ownership on gender equality issues;
- Improve gender information sharing within the organization;
- Allocate adequate resources for gender mainstreaming and other gender activities;
- Document and share information on best practices that have made a positive contribution to mainstreaming gender in an organization; and
- Conduct a gender audit at regular intervals (3-4 years) to assess progress on gender issues.

⁸ For more information about ICIMOD’s approach to gender in its work and within the institution, please refer to chapter 7.

11.4 Implementing an Environmental Plan

Environmental sustainability is a fundamental tenet of ICIMOD's mandate, and is reflected both in terms the Centre's focal activities as well as in its compliance with relevant international and regional environmental agreements and obligations. ICIMOD intends to minimize its own environmental impact by improving the environmental sustainability of its operations during the MTAP-IV period. As an organization actively involved in the sustainable development of mountain ecosystems, ICIMOD is aware of the environmental impacts of its own operations. Through a commitment to continuous environmental improvement, ICIMOD aim is to ensure that its operations are undertaken in such a manner as to have minimum impact on the environment.

ICIMOD has drafted and adopted an environmental management policy that includes several key actions:

- Installation of solar photovoltaic system to augment power at ICIMOD complex;
- Establishment of carbon footprint baseline as a means to lower the institution's environmental site impact;
- Establishment of internal environmental management committee to plan and carry out initiatives such as tree planting events, installation of a bio-digester for cooking gas in the office canteen, and promoting recyclable and bio-degradable waste collection at ICIMOD;
- Pledging to procure more "green" or environmentally-friendly products and services during MTAP-IV;
- Conducting an energy audit for ICIMOD every two years;
- Tracking ICIMOD's carbon footprint in our ERP system;
- Applying for ISO certification on our environmental management system; and
- Providing regular trainings and information to staff for developing a stronger environmental awareness in the office.

12. Finance and Funding Plan

In this section, we review ICIMOD’s financial strategy for the MTAP-IV, its financial review system, and the institution’s funding plan for the next five years.

12.1 Financial Strategy for MTAP-IV

Over the past 10 years, ICIMOD has witnessed tremendous growth in its funding. MTAP-III concludes at the end of 2017. To date in MTAP-III, ICIMOD has raised USD 119 million in funding, compared to USD 69 million during MTAP II (72.4% increase). In Figure 12.1 below, we chart ICIMOD’s funding growth from its inception in 1983 to 2017, and project the anticipated gains for the MTAP-IV.

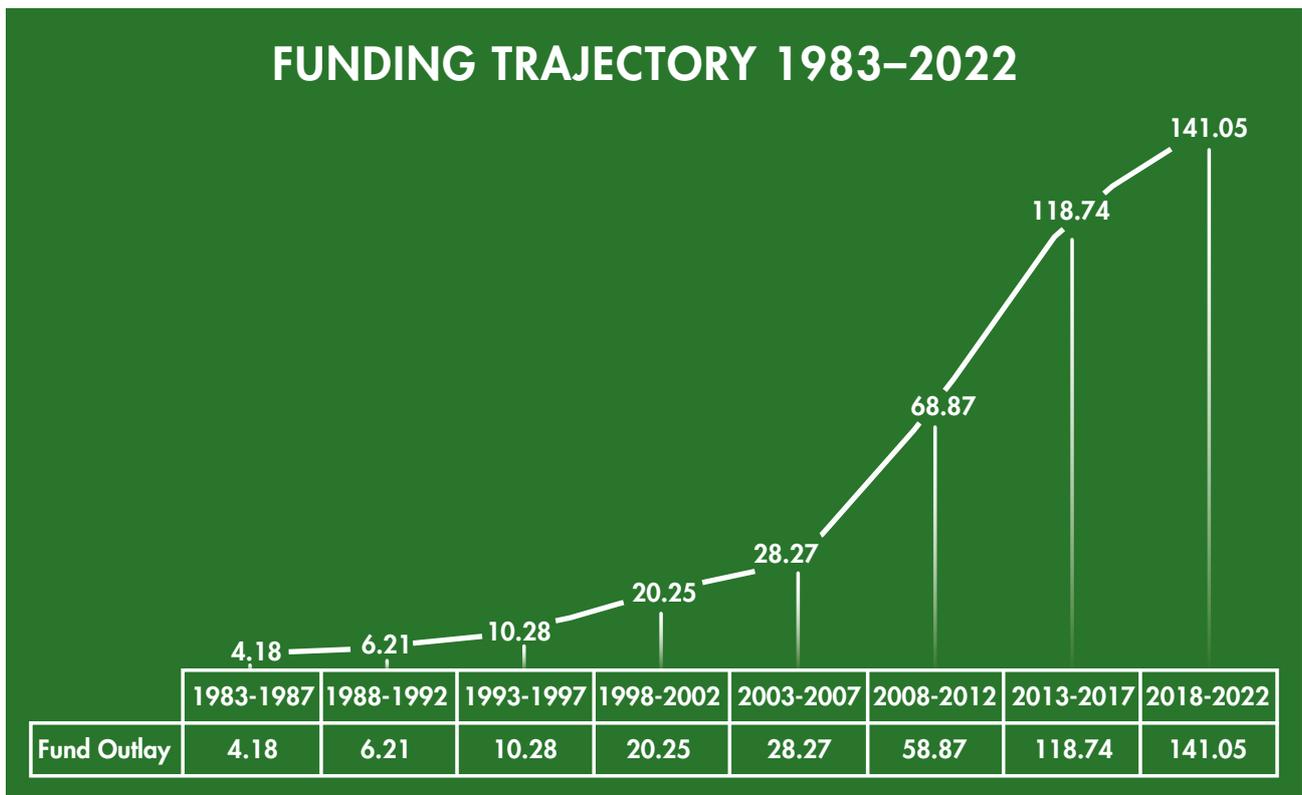


Figure 12.1: ICIMOD’s funding trajectory, 1983-2022.

In recent years, changes in the global context have made access to development funds more challenging. For this reason, we project a modest pace of growth also considering inflation (21%) in MTAP-IV – raising our revenue from USD 119 million to 141 million.

ICIMOD has two major funding sources: core funds and long-term programme funds. As well, both of these funds will see modest growth over the five-year period of MTAP-IV.

At the 42nd meeting of the Board of Governors in Bhutan, the Regional Member Countries (RMCs) agreed to increase substantially their financial commitment to ICIMOD per the revised Funding Strategy. It is essential that RMCs display ownership through both annual contribution and commitment of in-kind resources to ICIMOD’s programmes. The annual core contribution from the RMCs is based on the Funding Strategy of ICIMOD in which the RMC contributions through 2020 have been agreed upon. At the midpoint of MTAP-IV, ICIMOD will revisit RMC contributions to calculate additional years of funding, beyond the scope of the current five-year plan.

Continue to move from project funding to long-term programme funding

In the MTAP-III period we have taken a strategy to gradually move from individual project-based funding to longer-term programmatic funding. Nearly 83% (or USD 98 million) of the total funds generated during MTAP-III are from funding contracts that are more than four years in duration. In the coming strategy period, we will increase our efforts to generate long-term programme funding, which provide a strong foundation for our long-term operation and sustainability. ICIMOD will solicit such funding from regional and non-regional financial partners that share its strategic objectives, strategies, and methodologies.

Our experience shows small projects and short-term funding often result in more effort and less output for our activities. Thus, short-term activities will be minimized in future, except where such projects are aimed at generating specific and innovative ideas that do not warrant a longer-term investment at such a point in time. During MTAP-IV, ICIMOD will continue to improve its cost control measures for each programme/project implemented.

Ensuring full cost recovery

ICIMOD will reduce core funding cost expenditures for individual projects, mostly small, that are inadequately funded and/or do not contribute their fair share to overhead. In the future, ICIMOD will discourage such projects and insist that funding be adequate for self-sufficiency in all aspects. In other words, ICIMOD will implement a system of full cost recovery.

The programmes described in this MTAP-IV document (see chapter 5) fall in line with the revised Strategy and Results Framework and indicate potential for expansion of ICIMOD's plans and reach during the next five years. The growth and expansion of the organization's operations will directly affect the fund management and financial control in the organization. For this reason, ICIMOD recognizes that strong financial monitoring and control will continue to be paramount for maintaining its financial management system.

12.2 Strengthening ICIMOD's Financial Management System

ICIMOD's financial management system is governed by its Finance Policy and Procedures Manual, which has been approved by its Board of Governors (BoG). There is a Finance Committee of the Board of Governors at ICIMOD who oversee the overall financial management and performance of the Centre, which includes the appointment of auditors.

From 2011, ICIMOD's finance department has adopted several initiatives to strengthen the system and enhance coordination between finance and the programme units. MTAP-IV plans and processes in finance include, among others, monthly management reports for up-to-date and timely financial information, tracking expenditures to the activity level, information on expenditure commitments at the programme/project level, and automation of all administrative processes.

ICIMOD is implementing an Enterprise Resource Planning (ERP) known as "STAR" system that integrates management information systems across the organization. This automation has not only increased the efficiency of processes, but also greatly reduced manual work, thereby contributing to reduced administrative costs. The ERP system will be further strengthened in the next MTAP period by enhancing the business intelligence features, developing an online payment system, preparing annual plans and budgets templates in the system, and integrating functions like publication and maintenance requests, which are currently processed manually.

Cost consciousness and internal control

ICIMOD functions in an internal control environment which is based on the principles of financial prudence, transparency in operations, proper segregation of duties, and adequate control of country and regional financial reporting. This provides reasonable assurance that there are mechanisms and controls in place to ensure that the funds managed by the Centre are used for their intended purpose. We

maintain detailed controls for all main financial areas – expenditure, salaries, travel, timesheets, assets, treasury and income.

Our existing internal control system has inbuilt internal checks at different authority levels to ensure cost efficiency and cost effectiveness as core values in all expenditure proposals. Effective rates of return and value for money are taken as the most important factors in decision making. These control systems will be further strengthened during MTAP-IV.

Transparency, accountability, and cost efficiency

ICIMOD follows a value system of transparency, accountability, and cost efficiency at all levels of operation. These values are ensured through an analytical accounting system based on the following core principles:

- Close and strong monitoring of operations at the partner level;
- Tracking of financial commitments to partners and vendors;
- Proper cost accounting through correct allocation of staff time in respective cost centres;
- Emphasis on value-for-money procurement practices; and
- Strong internal controls through the regular internal auditing.

Value for money procurement practices

ICIMOD ensures value for money in its operations through cost efficient mobilization of resources (e.g., consultants, raw materials, and capital investments) while ensuring required effectiveness in output delivery. We ensure the value for money in the following ways:

- Conducting detailed scrutiny of partner organizations;
- Institutionalizing strong budgeting processes;
- Requiring transparency in operations;
- Maintaining required internal control systems for ensuring proper delivery of outputs; and
- Utilizing impact pathway and M&E systems to ensure results.

Beyond these measures, ICIMOD follows a separate procurement policy approved by the Board, which ensures adequate control over procurement of goods and value for money in every such procurement.

Ethical practice – zero tolerance for fraud and financial irregularity

ICIMOD maintains a “zero tolerance” policy towards fraud and corrupt practices of its staff members, nor will it work in partnership with organizations found to have such practices in the execution of projects. Implementing partners must include in their contract a clause requiring them to report to ICIMOD and take action against any fraud which occurs in their organization. This ethical practice policy will be further strengthened in the coming strategy period.

Partnership related

Partner organizations use their own policies and procedures in relation to their fund management. However, the finance function in the Centre ensures that certain standards relating to financial prudence, cost efficiency, value for money, procurement transparency, accurate financial reporting, and other compliance requirements are stipulated in the Letter of Agreements with ICIMOD’s partner organizations. ICIMOD will assess and enhance both the financial and management capacities of its partner organisations through due diligence and continuous review processes.

12.3 Funding Sources and Their Use

Core funds

Core funds are financed by contributions from regional and non-regional countries. ICIMOD will explore new donor possibilities for securing core funds. In the MTAP-IV period, activities to be funded by core funding will be clearly defined.

Programme funds

Programme funds will be provided largely by sponsors and financial partners from outside the region. The long-term programme funding will be a strong foundation for ICIMOD's long-term operations and sustainability and will constitute the bulk of its budget. We will encourage such funding from non-regional financial partners who share our strategic objectives, strategies, and methodologies. In this way, ICIMOD seeks to avoid piecemeal project funding by selecting only activities that fit into the Strategy and Results Framework 2018 and the current MTAP.

Cost structure

Direct costs

Within direct costs there are core costs and long-term programme costs. Core funds will be financed by contributions from regional and non-regional countries.

Core funds are used

- To fund those activities that contribute directly to fulfilling ICIMOD's mission and include programmatic areas that are not adequately funded through programme and project funds;
- To finance development of new and innovative ideas, to scale up of activities, to provide bridge funding for essential activities until new funding is sourced, to support essential leadership functions (Board and Directorate);
- To improve the effectiveness of our institutional functions such as development of new partnerships and strengthening of existing ones; for enhancing our monitoring and evaluation systems; and for augmenting our institutional information, knowledge management, and communication functions.
- To build and maintain relationships at the highest levels with ICIMOD's RMCs and with non-regional funding countries and other international agencies.

Core funds are not used for office administration and operational costs as these costs are fully covered by the indirect costs which are recovered in the programmes and projects.

Long-term programme costs are multi-year programme funds financed largely by non-regional sponsors and financial partners who share our strategic objectives, strategies, and methodologies. These funds constitute the bulk of ICIMOD's budget and form the primary component of the direct programmes costs. Direct programme funds include all the resources that are remitted to the implementing partners in the RMCs and cover the organization of all research, workshops, conferences, publications, and field visits to programme areas plus applicable indirect costs.

Indirect costs

Indirect costs are costs of the Centre that are not directly attributable to a particular programme or project, but are necessary to the operation of the organization and the performance of the project.

Indirect costs are used

- To fund the day-to-day operating services and maintaining facilities in the office (e.g., electricity, water, fuel, heating and cooling etc).
- To fund the general administrative expenses of the Centre e.g. administrative staff salary and benefits, material and consumable supplies, equipment maintenance, insurance, depreciation and security of office assets.

Foreign exchange gain/loss is not considered as part of the Indirect Cost as the same is treated as an extraordinary item in the financial statements. Similarly, Indirect Costs do not include costs like maintenance of Internet portals, publications, maintenance of data banks, vehicle costs, and human capacity development.

The applicable rate of indirect costs for the current MTAP-III period is approximately 17 per cent of the direct cost and 14 per cent of the total cost. Prior to MTAP-IV we will conduct a review to arrive at the applicable indirect cost rates for the next five years. All funding proposals that we honor will ensure full cost recovery. The funding of the indirect costs will be primarily from the recovery of overheads and charge-outs from the projects.

12.4 Funding Projection

The MTAP-IV funding and expenditure projections are presented in the following table.

						USD Million
MTAP-IV Funding Projection	2018	2019	2020	2021	2022	Total
Core Funds	10.00	10.00	11.00	12.00	12.00	55.00
Programme/Project Funds	15.00	17.00	18.00	18.00	18.00	86.00
Total MTAP-IV Fund Projection	25.00	27.00	29.00	30.00	30.00	141.00
MTAP-IV Expenditure Projection	2018	2019	2020	2021	2022	Total
Regional Programmes (Core, Programme, Project funds)						
RP1 - Adaptation and Resilience Building	4.08	4.40	4.73	4.89	4.89	23.00
RP2 - Transboundary Landscapes	3.68	3.96	4.26	4.40	4.40	20.70
RP3 - River Basins and Cryosphere	3.68	3.97	4.15	4.16	4.36	20.32
RP4 - Atmosphere	3.45	3.31	3.44	3.42	3.63	17.25
RP5 - MENRIS	3.04	2.86	3.07	3.18	3.18	15.33
RP6 - Mountain Knowledge and Action Network	2.50	3.50	4.00	4.40	4.00	18.40
Total Regional programmes (Core, Programme, Project Funds)	20.43	22.01	23.64	24.46	24.47	115.00
Core Support to Innovations and Integration						
Themes and Outscaling	1.05	1.15	1.30	1.34	1.34	6.18
Innovation funds for new ideas	1.00	1.20	1.30	1.33	1.30	6.13
Gender Integration	0.35	0.37	0.39	0.42	0.42	1.95
Total Core support to Innovations and Integration	2.40	2.72	2.99	3.09	3.06	14.25
Core Support to Institutional Functions						
Board of Governors	0.24	0.24	0.25	0.26	0.26	1.25
Directorate	0.77	0.79	0.82	0.84	0.85	4.08
Strategic Planning Monitoring Evaluation (SPM&E)	0.23	0.24	0.25	0.25	0.26	1.22
Knowledge Management & Communication (KMC)	0.45	0.49	0.53	0.57	0.57	2.61
Partnership & RMC relations	0.49	0.51	0.52	0.54	0.54	2.59
Total Core support to Institutional functions	2.18	2.27	2.37	2.46	2.48	11.75
Total MTAP-IV Expenditure Projection	25.00	27.00	29.00	30.00	30.00	141.00
Administration Expenses	2.24	2.35	2.47	2.59	2.72	12.37

- Note:** 1) The Administration expenditure is fully covered by the overhead built in the Regional Programme expenditure, hence not shown separately.
 2) The full budget for Gender, SPM&E, KMC and Partnership comes mostly from Regional Programmes and also consists of core funds presented in the table.

South Asia Network for Development and Environmental Economics (SANDEE) was hosted by ICIMOD during MTAP-III. In MTAP-IV SANDEE will be merged in ICIMOD and shall be placed in Regional Programme VI – Mountain Knowledge and Action Networks with its branding intact. The minimum core funding for SANDEE shall be ensured in MTAP-IV.

13. Strategic Planning, Monitoring, and Evaluation

13.1 Background and Rationale

ICIMOD being a regional knowledge center has accountability towards its member countries, development partners, and other stakeholders for producing and demonstrating high quality results and impacts at higher scales related to improved wellbeing of people of the Hindu Kush Himalayan region. The Strategic Planning, Monitoring, and Evaluation (SPM&E) Unit aims to support and advice the Centre in becoming more results oriented and to improve its focus on outcomes and impacts. ICIMOD has been able to enhance its results-based planning, monitoring and evaluation at institutional, programmatic, and partner's levels. The Strategic Planning, Monitoring and Evaluation system in ICIMOD has been evolving since 2003 with various form of improvements. As it is depicted in Figure 13.1, during MTAP I 2003 – 2007 period, ICIMOD initiated a modest start by introducing a preliminary M&E systems for the first time at ICIMOD. Before 2003, M&E system was run on ad hoc basis. There was no orientation of the M&E system at institutional level. Taking learning from implementation of the preliminary M&E systems introduced during MTAP I, at the beginning of MTAP II, ICIMOD introduced institutional level M&E systems by introducing strategic planning and results orientation at institutional level.

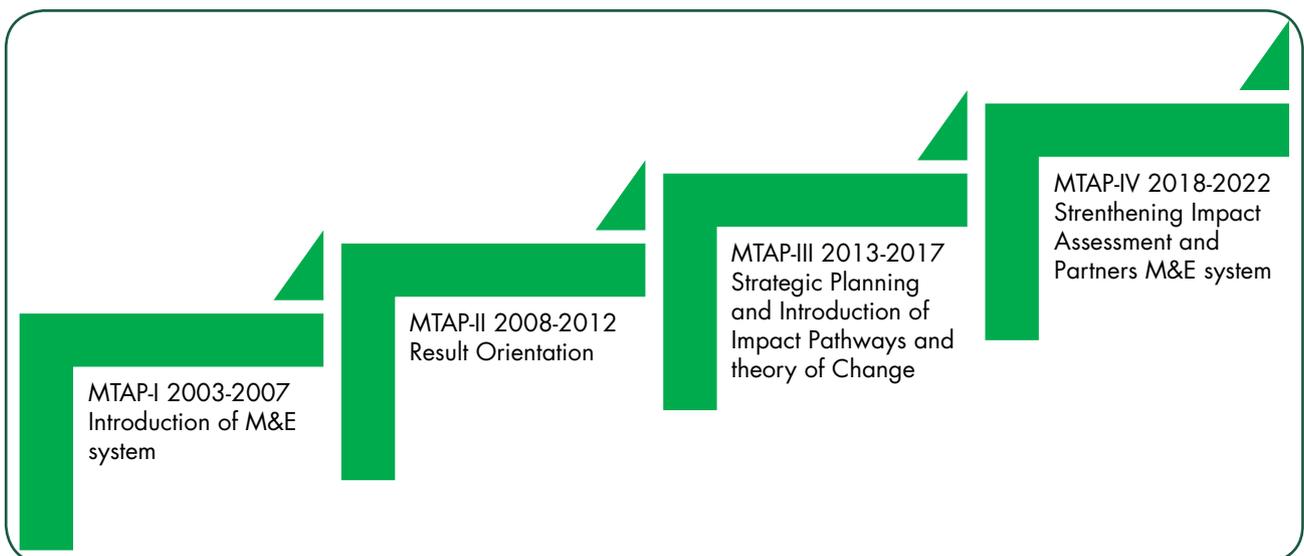


Figure 13.1: Evolution of ICIMOD PM&E system

Since 2013, ICIMOD has made significant improvements in its M&E and Impact assessment systems while taking into account the complexity of the systems ICIMOD works with. ICIMOD introduced theory of change and impact pathways as mandatory approach for planning, monitoring and evaluation process applied to programmes, initiatives and partner's level. ICIMOD was also able to bring onboard required human resources to support and implement such systems. At the same time, ICIMOD established partnerships with J-Pal, 3ie and IFMR India for improving impact assessment capacity of ICIMOD.

The Strategic Framework 2017 clearly identifies impact orientation as a strategic priority using theory of change and Impact Pathways as a tool for planning, tracking and measuring results and impacts. The impact-oriented approach helps in driving the effective application of results-based management in programming, implementation, partnerships and performance management of ICIMOD. Further

emphasis is being put on strengthening impact assessments and also capacity building of partner institutions in M&E.

Planning, Monitoring and evaluation priorities for the MTAP-IV period

- To make theory of change, impact pathways and learning a regular practice in the cycle of programme planning, monitoring, and evaluation
- Strengthen the center wide planning and budgeting process by introducing new and efficient approaches and tools
- Building on existing strengths, to design and implement a system that can track progress, outcomes, and impacts of the Regional Programmes, initiatives, and activities involving diverse partners in the region
- To ensure that frameworks and indicators are sensitive enough and responsive to issues of gender equality and environmental sustainability
- To track the scientific quality and use of products and the up-scaling of knowledge generated by ICIMOD in the region and beyond

13.2 ICIMOD Planning and M&E Approach

Recognizing the fact that ICIMOD is a regional knowledge organisation that impact will be achieved through utilization and up-scaling of the knowledge and practices working with and through different partners. Bringing about the 'change' in the face of complexity which takes place within social-economic-environmental system in a highly non-linear way and linking the design, learning, and, monitoring and evaluation is imperative to comprehend, identify and understand the complex impact pathways. Therefore, Innovation, Integration and Impact are important for the centre. Not everything can be known about how change occurs, yet pathways of change planning at the start is the fundamental tenet of innovation about the theory of change and impact pathways (Figure 13.2).

A theory-based approach to impact can help to draw out the main impact pathways in order to make the theory of change explicit in terms of different actors and users of outputs and outcomes leading to

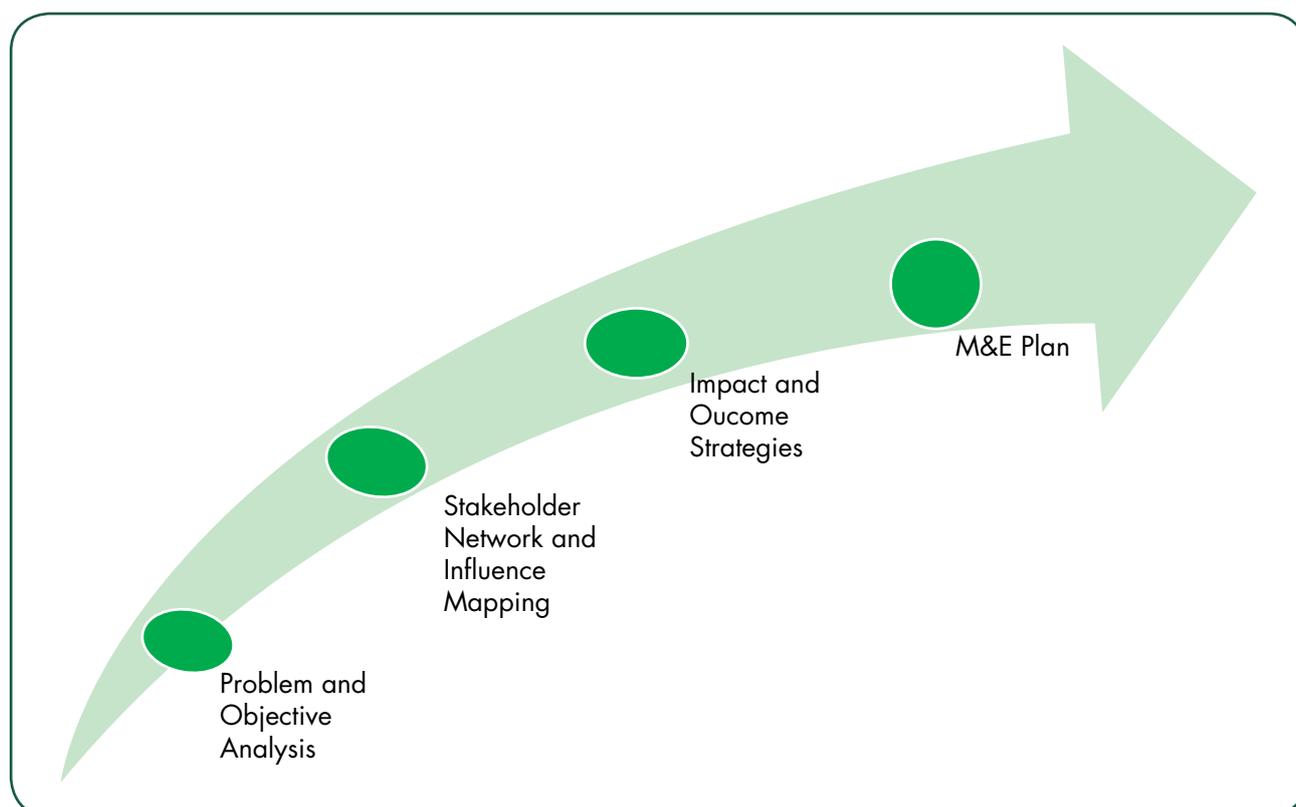


Figure 13.2: Theory of Change and Impact

development impacts. Therefore, guided by the Centre’s vision, ICIMOD is working on the twin elements of impact pathways that are:

- Validation of the contribution of ICIMOD to changes in the poverty and wellbeing of the communities in HKH region, and
- Changes in the physical and social vulnerabilities and ecosystem services in the HKH region, as well as to increase the understanding of the processes that enable changes to take place in complex biophysical and sociocultural contexts.

This will enable ICIMOD to provide improved evidence around the way it works directly and with partner’s contribution to impact within the Strategic and results framework. The focus for creation of evidence is to facilitate accountability to stakeholders and to support learning and policy information and influence. The theory of change approach provides good basis for designing robust impact evaluations using both experimental and non- experimental methodologies.

Mainstreaming gender into standard result based management involves both technical and political process and begins right from the beginning of identifying gender gaps. Therefore, gender and social equity lens will be used in each step of developing TOC, impact pathway and M&E system.

The seven step framework with sets of guiding questions for mainstreaming gender in result based management will be adapted and used to facilitate the process of gender transformative change through planning, monitoring and evaluation. Specifically, due consideration will be taken to ensure the following during process:

- Developing gender sensitive indicators
- Setting up results targets in line of reducing gender and inequality gaps
- Strengthen M&E system to collect, compile and analyze disaggregated data
- Exclusive highlight of gendered outcome, achievements to reduce other inequality issues and concerns in reviews, reports and communication
- Strengthen partners ‘capacity in analysis of M&E data in relation to gender

13.3 SPM&E Responsibilities

The strategic planning, monitoring and evaluation unit within ICIMOD is an advisory unit providing technical support and guidance to integrate results based planning, monitoring and evaluation (RBM&E) across all of the ICIMOD interventions. With the aim of overall guidance and technical support the unit performs the following major responsibilities (Figure 13.3):

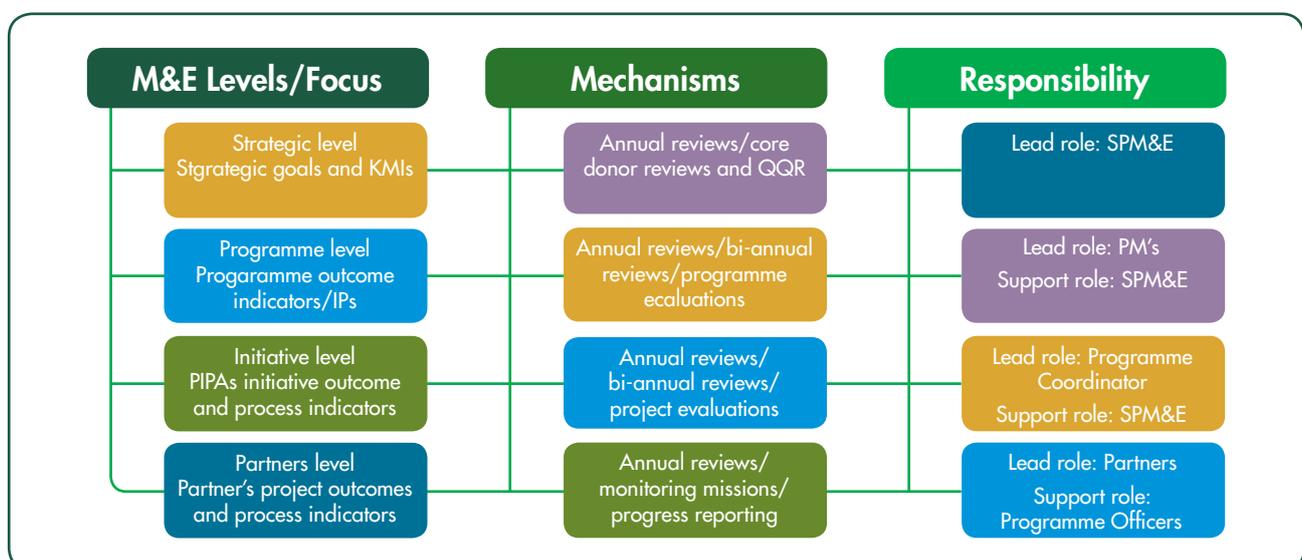


Figure 13.3: SPM&E Responsibilities

- The SPM&E unit will provide technical backstopping in designing the strategic framework for the organisation, defining strategic results, developing key measurement indicators to measure these results and the tools and guidelines to measure the change.
- SPM&E will also coordinate with ISG in implementing the institutional level five yearly independent review of ICIMOD which is called Quinquennial Review (QQR)
- At the programmatic level, the unit will support ICIMOD Programmes including partners to design the theory of change and impact pathways for the programmes and initiatives.
- Based on the ToC and impact pathways the unit will support initiatives and programmes to develop the PM&E and will link this system with the overall results of the organization. The ToC will also provide a basis for the impact evaluation and the unit will provide comprehensive guidelines for the rigorous impact evaluations of the programmes and initiatives and will ensure that the impact evaluations follow the guidelines.
- The SPM&E unit will facilitate periodic reviews and monitoring and disseminate the findings of within the management and professional staff on regular basis for course correction and will coordinate with the knowledge management and communication section to develop knowledge products out of the evaluation reports and disseminate the products to the relevant stakeholders accordingly.
- Capacity building of the ICIMOD relevant staff and partners in the theory of change, impact pathways, impact evaluations and the use of M&E plans in a proper way will be one of the key responsibilities of the unit.
- The unit will organize reviews on regular basis to provide feedback to integrate RBM&E into the programmatic and institutional functions of the organization. The SPME head will report to the DG and SMC on issues that arise from evaluation and monitoring so that corrective action can be taken.

13.4 ICIMOD Result Hierarchy

In the MTAP-IV period, ICIMOD will be working through six Regional Programmes to achieve its seven strategic results, which are expected to make positive impact on three areas of reduced poverty, reduced physical and social vulnerabilities and improved ecosystem services. Each regional programme has clear outcomes and sets of indicators for measuring success. The programme outcomes and indicators are aligned to the seven strategic results and will be mapped for clear guidance to track results and reporting. Key Measurement Indicators (KMIs) will be introduced to capture the programme contributions to the strategic results (Figure 13.4). The initiative level result framework and TOC will be aligned to the corresponding regional programme outcome indicators.

The M&E system designed in line with ICIMOD results framework will generate monitoring data for verifying achievement of results at the institutional level, thus reducing monitoring costs. Essentially, detailed result based monitoring and evaluation plans for all of the initiatives will be put in place and the respective monitoring data will be systematically collected, compiled, analyzed, and shared at appropriate levels of detail to relevant audiences. The plan will include M&E activities with clear roles of stakeholders including external evaluators. Likewise, the initiative result framework and its M&E system will be linked with those of participating partner institutions within their domains of responsibility.

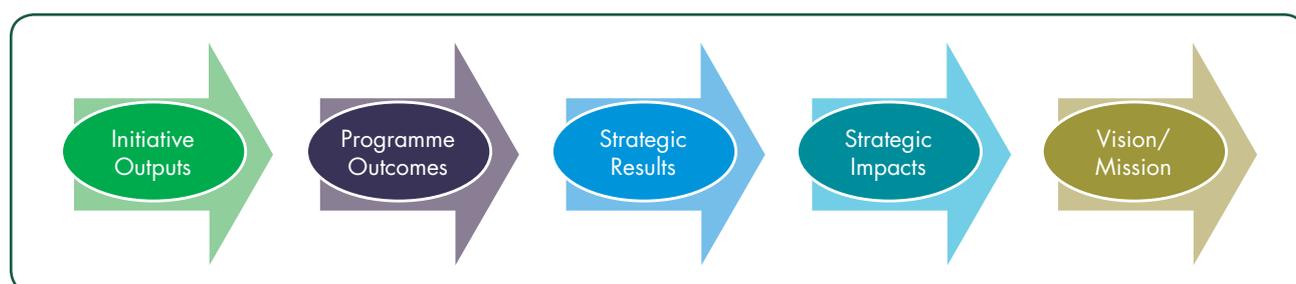


Figure 13.4: ICIMOD Results Hierarchy

The M&E system will be further enhanced for systematic collection, validation and documentation of innovations and actual changes in end results – for example the desired management capacities, risk reduction changes, regional cooperation levels, etc. and the reports quality will be enhanced accordingly. The programme feedback will have a good connection to the planning system.

13.5 Strategic Planning

Strategic planning is a systematic process in defining strategies, setting up institutional milestones and making decisions on allocating its resources to pursue its strategic direction. For ICIMOD it is very critical for defining an institutional level planning mechanisms for guiding the implementation of the strategic framework.

Based on ICIMOD strategic framework, Medium Term Action Plan (MTAP) IV provides basis to plan and allocate resources for meeting ICIMOD's long term objectives. ICIMOD's implementation approaches and mechanisms are defined in MTAP.

SPM&E Unit provides guidance, tools and coordinates planning process that brings together programmes, initiatives and resources under common framework. Initiatives and projects are used as an input to meet regional programme objectives which are aligned with Centre's strategic results.

During MTAP-IV, ICIMOD will further strengthen its planning process with the following new tools and processes.

- Setting five yearly targets and milestones against strategic results
- Annual Planning and Budget Meetings
- Online Annual Planning and Budgeting tool
- Quality Assurance System for planning and budgeting

An annual programme plan at the institutional level will serve as a common single planning document for consideration by all core and programme sponsors. At the initiative level, annual plans will be developed together with the partner institutions.

13.6 Strategic Monitoring

ICIMOD's strategic monitoring and internal performance evaluation will focus on four aspects – institution, programmes, RMCs, and strategic thematic areas. At the institutional level, seven strategic results will be monitored through key measurement indicators that measure the Centre's relevance and effectiveness. Key measurement Indicators (KMIs) will be introduced and used to monitor and assess specific key contributions of programmes and initiatives towards seven strategic results of the institution. Internal review and evaluation processes will be applied to get performance data against strategic results and programme outcomes. In MTAP-IV, the Centre has articulated RMC-specific intervention strategies that will be monitored to assess the degree of responsiveness towards individual RMC needs and priorities.

Strategic monitoring process and instruments will include:

- Annual and bi-annual regional programme progress reviews;
- Progress discussion with and feedback from Programme Advisory Committee of the Board.
- ICIMOD/RMC partner day's proceedings conducted by strategic cooperation unit;
- Institutional-level reviews of strategic result indicators
- Regular senior management committee meetings;

Besides the above, outcome and impact studies, learning missions, and success story documentation will be commissioned jointly with external reviewers to come up with credible evidence of ICIMOD's contributions in HKH region and beyond.

13.7 Programme Monitoring

Programme monitoring involves monitoring of the outcomes and strategies, through defined indicators for each of the Regional Programmes. By extension, this monitoring also involves initiatives implemented under each of the Regional Programmes. The theory of change and impact pathways developed during the planning stage for each of the Regional Programmes and initiatives will serve as the basis for programme monitoring.

The programme managers will be collecting monitoring data using monitoring tools, analysed, documented, and disseminated through internal monitoring reports to be contributed also by the participating partner institutions. An annual progress report at the institutional level will serve as a common single document for consideration by all core and programme sponsors. At the initiative level, programme coordinators will prepare periodic progress reports for the sponsors based on operational partner reports and other monitoring inputs.

The reviews of programme progress following a traffic light system will be continued for monitoring of all Regional Programmes. Other monitoring instruments will include:

- Annual progress reviews of programmes and initiatives;
- Periodic Partner progress reviews;
- Field monitoring visits and partner consultations;
- E-based surveys and case studies.

13.8 Evaluation

Evaluation mechanisms at ICIMOD are aiming at providing both credible and useful information on the performance of programmes, initiatives and other pilot level interventions. At the same time evaluations at ICIMOD aim at determining the worth and significance of Centers interventions it implements in RMCs and its impacts on the wellbeing of wider HKH communities. This way, evaluation mechanisms at ICIMOD enable incorporating lessons learned from implementation of programmes and evaluations back Centre wide decision-making process for better programming. Therefore, at ICIMOD we consider evaluations as the systematic and objective assessment of on-going or completed programmes and initiatives, their design, implementation and results.

During MTAP-IV evaluation of performance to achieve strategy and results framework of ICIMOD will follow globally accepted best practices and will include evaluations that are independent and impartial to the decision-making process, delivery and management of the programmes that ICIMOD will implement across RMCs. This way evaluation mechanisms at ICIMOD will provide periodic and objective assessment of the extent to which ICIMOD programmes have achieved or likely to achieve MTAP-IV objectives.

Institutional level independent evaluation will be conducted every five years – towards the end of MTAP-IV. This evaluation is called Quinquennial Review (QQR) such independent and strategic evaluation is critical to assess the performance of overall Center, its strategic orientation and strategic results. Terms of references for such reviews are approved by the Board of Governors and implemented by ICIMOD support group.

At programmatic level, both internal and external evaluations will be conducted to assess the performance of programmes being implemented during MTAP-IV period against their respective objectives and outcomes. To facilitate programmatic level evaluations, evaluation designs will be established following relevant and rigorous evaluation mechanisms and methodologies. Such evaluation designs will be established through external and independent evaluation institutions and through independent evaluation experts. Follow-ups on programme performance will be conducted through internal as well as external mid-term evaluations. Performance of programmes and initiatives in terms of

relevance, efficiency, effectiveness, impact, and sustainability will be assessed through independent end of programme and initiative evaluations. In order to ensure transparency all evaluation findings will be publically available through our website.

To ascertain whether different types of evaluations mentioned above are justified, ICIMOD will apply evaluability assessment tool which is a systematic process that helps identify whether programme evaluation (Process and/or Impact evaluation) is feasible and likely to provide useful information for decision making. Evaluability assessment is not only critical to show whether a programme can be meaningfully evaluated, but also whether conducting the evaluation is likely to contribute to improved programme performance and management.

13.9 Impact Assessments

Following rigorous evaluation designs established for the programmes, initiatives, and, interventions being implemented under MTAP-IV, robust impact evaluations will be conducted for selected programmes, initiatives, and, interventions. These impact assessments will follow both experimental, non-experimental and qualitative methodologies.

13.10 Learning

M&E processes can be among the most effective ways to foster learning for sustainable programme delivery and management. The information and insight gathered through monitoring and evaluation is not only used for accountability, but also for setting up mechanisms of reviews and reflections with various stakeholders to know why certain strategies work and certain strategies do not and why? ICIMOD will use the following strategies in MTAP-IV:

- Participatory development of impact pathways and theory of change;
- Revisiting of programme theories of change on regular basis;
- Promoting internal learning review of various initiatives; and
- Continue institutional level review where challenges, issues and emergent outcomes are discussed and key learning distilled.

Annex 1: Results Framework

Vision

Men, women, and children of the Hindu Kush Himalaya enjoy improved well-being in a healthy mountain environment

Mission

To enable sustainable and resilient mountain development for improved and equitable livelihoods through knowledge and regional cooperation.

Strategic Impact

- Reduced poverty;
- Reduced physical and social vulnerabilities;
- Improved ecosystem services

Strategic Results

- Widespread adoption of innovations and practices developed by ICIMOD and partners to adapt to change, leading to positive impacts for women, men, and children.
- Significant advances in the generation and use of relevant data, knowledge, and analysis.
- Significant advances made in approaches and knowledge that promote gender equality and inclusive development.
- Significantly developed human and institutional capacity.
- Policies considerably influenced by the work of ICIMOD and its partners.
- Enhanced regional cooperation related to sustainable mountain development.
- Global recognition of the importance of mountains to ensure improved and resilient livelihoods and ecosystems.

Regional Programme: Adaptation and Resilience Building

Outcome

- Enhanced resilience of HKH women and men to socioeconomic and environmental changes, including climate change.

Indicators

- Number of women and men who benefit from innovative interventions by reducing poverty, risk and vulnerabilities leading to resilience
- Number of local institutions adopting gender sensitive, risk reduction and resilience building practices in areas of community DRR, tourism access to clean energy, natural resource management, value chain development, and adaptation to climate change
- Number of regional, national, and sub-national institutions making use of the gender sensitive Resilient Mountain Solution Approach promoted by the programme that reduce poverty, risks and vulnerabilities and promote resilience.
- Number of mountain-specific national or sub-national development policies making use of recommended practices and knowledge.
- Effective regional knowledge and experience sharing mechanisms supporting regional member countries to promote mountain-specific resilience practices.

- Number of global fora at which ICIMOD’s mountain-specific resilience agenda are promoted by regional member country representatives and institutions.

Regional Programme: Transboundary Landscapes

Outcome

- Improved transboundary cooperation among member countries demonstrated through regional policies and strategic partnerships leading to sustenance of mountain ecosystem services and equitable livelihood benefits at regional landscape levels.

Indicators

- Number of sub-national, national, regional and global institutions and networks using programme inputs for developing good quality and inclusive projects, programmes, research/monitoring protocols, frameworks, and guidelines in mountain landscapes (including a mix of forests, rangelands, farming systems, soils, springsheds, watersheds, wetlands, peatlands) for sustenance of ecosystem services and poverty reduction.
- Number of high quality long-term research and monitoring results used for development of approaches to transboundary management, planning and implementation that are suitable to the complex biophysical, social-cultural and historical relationships within the HKH
- Number of policies and decision making processes influenced at sub-national, national, sub-regional and regional levels leading to sustainable landscape management and effective regional cooperation.
- Number of references showing ICIMOD’s highly quality contributions to global agenda settings (SDGs, UNFCCC—Global Landscape Forum, IPBES, IPCC and CBD) and commitments (NDC) for promoting sustainable mountain development.
- Number of women and men benefited in equitable manner by integrated conservation and development approaches in identified transboundary landscapes leading to sustenance of ecosystem services and poverty reduction.

Regional Programme: River Basins and Cryosphere

Outcome

- RMC policies, strategies, and development programmes highly critical to water resources management and disaster risk reduction in HKH region influenced through robust evidence from scientific research, gender responsive practices and capacity building in the areas of river basins and cryosphere.

Indicators

- Number of policies and strategies using ICIMOD outputs related to integrative and inclusive water resource development and management, and equitable benefit sharing that leads to reduced physical vulnerabilities and reduced poverty.
- Number of organizations effectively using and adopting innovative, gender sensitive, and context-specific water resource management practices at different scales using a water-energy-food nexus approach.
- Number of organizations from RMCs engaged in regional cooperation on cryosphere, climate services, and DRR contributing to reduced physical and social vulnerabilities.
- Number of selected RMCs with substantial amounts of cryosphere in their territory having long-term and scientifically-robust monitoring programmes on these resources.

Regional Programme: Atmosphere

Outcome

- RMCs use science-based knowledge on air quality, atmospheric processes and climate to shape policies and actions leading to air pollution mitigation for improved environmental and human health.

Indicators

- Number of effective local, national and regional policies, processes, and strategies using inputs and analyses from the programme in the areas of air quality, and environmental and human health to foster air pollution mitigation.
- Number of instances showing global policy processes (UNFCCC, CCAC, IPCC) influenced by the programme.
- Evidence of effective regional collaborations on atmosphere, clean energy, or climate in the HKH.
- Number of women and men, and number of institutions in the RMCs, empowered effectively through capacity building to address air pollution.
- Number of initiatives launched by governments, communities, and the private sector to take sustainable, gender-sensitive, and socially inclusive measures to improve air quality leading to reduced poverty and social vulnerabilities

Regional Programme: Mountain Environment Regional Information System (MENRIS)

Outcome

- Significantly contributed to effective evidence-based decision making processes by governments, communities and individuals using scientific data, earth observation information, and geospatial technologies in the areas of agriculture, the environment, natural resources, and climate change.

Indicators

- Number of institutions and programmes effectively using high-quality information services and climate services for gender-sensitive and inclusive decision making on natural and social systems at different levels (community, national, sub-national, and regional) leading to reduced poverty, vulnerabilities and improved ecosystem services.
- Number of women and men using ICIMOD's databases within and beyond the region through innovative platforms.
- Increased number of originations and people (women and men) using earth observation and geospatial solutions as a result of capacity development.
- Effective mechanisms in place at national and regional levels that promote open access to scientific and geospatial data.
- Number of instances ICIMOD is recognized in global geospatial networks, forums, and exchanges.

Regional Programme: Mountain Knowledge and Action Networks

Outcome

- Enhanced capacity and collaboration among universities, research alliances, policy makers, and youth for sustainable development in the HKH and adjoining regions.

Indicators

- Increased number of universities employing high quality relevant curricula related to mountains and environmental economics influenced by the programme.
- Number of instances that collaborative research and gender inclusive training programs are organized by network members with their own resources.
- Increased number and quality of peer-reviewed publications by network members.
- Number of HUC fellows both women and men demonstrating effective sustainable mountain development work following the completion of an HUC scholarship and leadership program with priority to women.
- An effective regional platform that uses science-policy dialogues for regional cooperation leading to poverty reduction, improved ecosystem services and reduced vulnerabilities.

- Number of national and sub-national policies influenced by the programme that contributes to poverty reduction and reducing social vulnerabilities
- Number of instances where youth acquire new skills and leadership for promoting sustainable mountain development

About ICIMOD

The International Centre for Integrated Mountain Development, ICIMOD, is a regional knowledge development and learning centre serving the eight regional member countries of the Hindu Kush Himalaya – Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan – and based in Kathmandu, Nepal. Globalisation and climate change have an increasing influence on the stability of fragile mountain ecosystems and the livelihoods of mountain people. ICIMOD aims to assist mountain people to understand these changes, adapt to them, and make the most of new opportunities, while addressing upstream-downstream issues. We support regional transboundary programmes through partnership with regional partner institutions, facilitate the exchange of experience, and serve as a regional knowledge hub. We strengthen networking among regional and global centres of excellence. Overall, we are working to develop an economically and environmentally sound mountain ecosystem to improve the living standards of mountain populations and to sustain vital ecosystem services for the billions of people living downstream – now, and for the future.



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