

1 **CHAPTER 1: INTRODUCTION**

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## 8 GLOBAL MOUNTAIN PERSPECTIVE

9 Mountains occupy 22% of the world's land surface area and are home to about 13% of the world's  
10 population (FAO, 2015). About 915 million people live in mountainous region, less than 150 million  
11 people live above 2,500 meters, and only 20-30 million people live above 3,000 meters elevation. Half  
12 of all humankind directly depends on mountain resources, primarily water. Mountains support 25%  
13 of world's terrestrial biodiversity and include nearly half of the world's biodiversity 'hotspots'. Of the  
14 20 plant species that supply 80% of the world's food, six of those (apples, barley, maize, potatoes,  
15 sorghum and tomatoes) originated in mountains (Fleury, 1999). In humid parts of the world,  
16 mountains provide 30-60% of the fresh water downstream; and in semi-arid and arid environments,  
17 they provide 70-95% (Kapos et al, 2000; WCMC-UNEP, 2002)). Mountains provide global goods and  
18 services in the form of water, hydroelectricity, timber, biodiversity and niche products, mineral  
19 resources, recreation, and flood management (Schild and Sharma, 2011; Molden and Sharma, 2013).  
20 In general, both poverty and ethnic diversity are higher in mountain regions and people are often at  
21 higher risk than people elsewhere. According to the FAO's recent analysis, 39% of mountain  
22 populations (urban and rural combined) in developing countries were considered vulnerable to food  
23 insecurity in 2012, an increase of 30% compared to 12 years prior (FAO, 2015).

24 Mountain ecosystems are fragile and subject to both natural and anthropogenic drivers of change.  
25 Mountains are also places of cultural meaning and refuge. Many mountain inhabitants have settled  
26 there to escape religious or political persecution or wars in lowlands. Mountains are also often focal  
27 areas of armed conflict. Mountain areas have ecological, aesthetic, and socioeconomic significance,  
28 not only for people living there, but for those living beyond —especially those in the lowlands who  
29 benefit from the ecological services mountains provide. Thus, mountains, in one perspective, stand  
30 as some of the planet's last natural 'islands' in a sea of changing lowlands, providing a number of  
31 significant ecological functions extending beyond mountain regions (Hamilton 2002).

32 Mountains also represent unique areas for detecting climate change and assessing climate change  
33 impacts (Nogues-Bravo et al. 2008; Dyurgerov and Meier 2005). As climate changes rapidly through  
34 elevation over relatively short horizontal distances, so do hydrology, vegetation, ecological  
35 conditions, and socio-economic settings (Whiteman 2000; Xu and Melick 2006). This rapid change  
36 over distance, in turn, also influences cultural values and societies. In this way, it is important to  
37 recognise the complexities of environment-society interactions — culture and environment are  
38 mutually reciprocating systems.

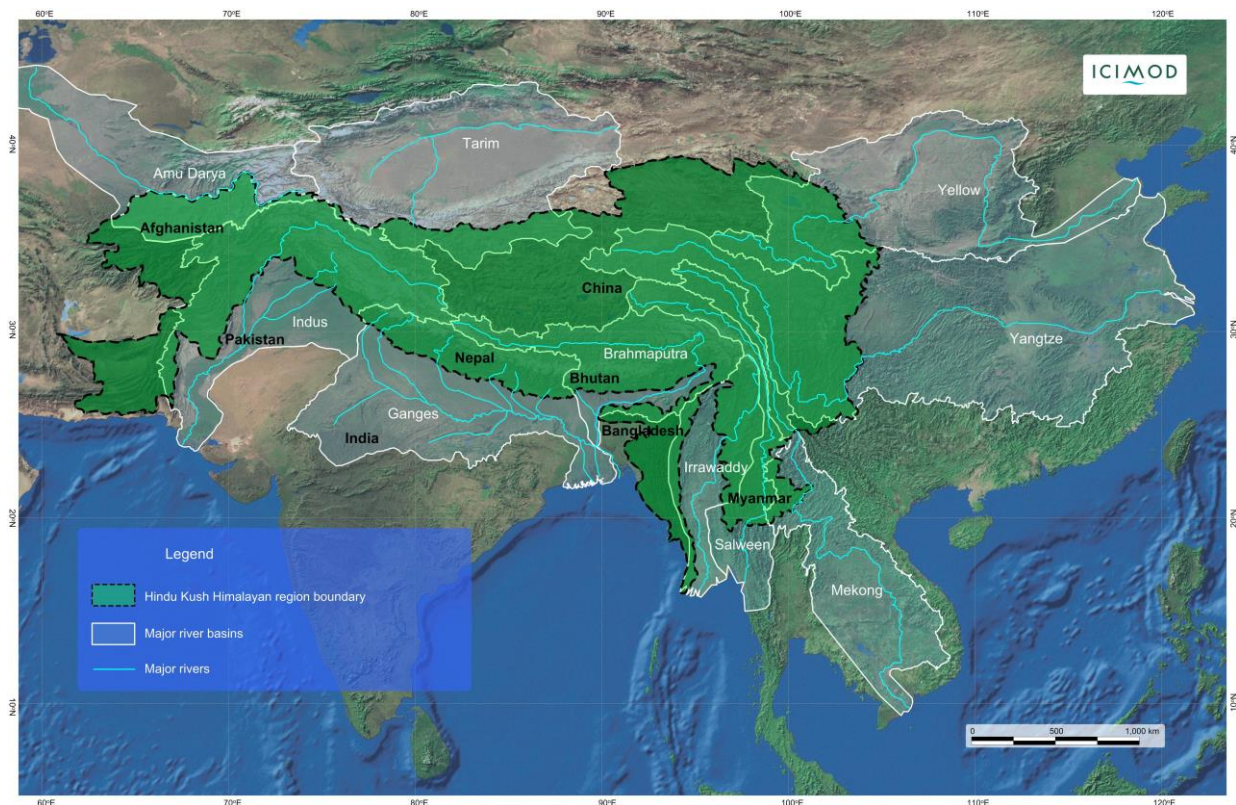
39 The increasing awareness of climate change impacts on mountains, mountain ecosystems, and  
40 mountain communities, have started drawing attention on mountains during international debates  
41 such as the United Nations Conference on Environment and Development in Rio de Janeiro in 1992,  
42 the SANDAI Framework 2015, the Paris Agreement 2015, and the Sustainable Development Goals and  
43 Targets 2030. There should be more pursuits for mountain views to form an integral part in any  
44 discussions about the future plans for sustainable development in the context of climate change.  
45 That means not just highlighting the vulnerabilities and fragilities inherent to mountain locations,  
46 but also emphasizing the resilience and strength that mountain people and communities bring when  
47 seeking to deal with these challenges.

48

## 49 HINDU KUSH HIMALAYA - A GLOBAL ASSET

50 A critically important geo-ecological asset, the Hindu Kush Himalaya (HKH) is the origin of 10 major  
 51 river basins and encompasses over 4.2 million km<sup>2</sup> area (Bajracharya and Shrestha, 2011; Bajracharya  
 52 et. al. 2015) (Figure 1). This HKH area and Tien Shan mountains together form the largest area of  
 53 permanent ice cover outside of the North and South Poles (hence, the occasional reference to the  
 54 HKH as the “Third Pole”) and home to four global biodiversity hotspots, 330 important bird areas  
 55 (Chettri et al., 2008), and hundreds of mountain peaks over 6,000 m. The region provides ecosystem  
 56 services (e.g., water, food, energy) that directly sustain the livelihoods of 210 million people. Nearly  
 57 1.3 billion people living downstream also benefit indirectly from its resources (Schild and Sharma,  
 58 2011), while more than 3 billion people enjoy the food produced in its river basins. The region is also  
 59 home to some of the most diverse cultures, languages, religions, and traditional knowledge systems  
 60 in the world.

61 The ethnic diversity and cultural wealth of the HKH extend from the Hindu Kush valleys in  
 62 Afghanistan to the diverse hill and mountain systems of Myanmar. Between these areas, we find the  
 63 arid and semi-arid regions of the Pamir and Karakoram mountains; the high Himalaya of India,  
 64 Nepal, and Pakistan; the un-spoiled beauty of Bhutan; the Tibetan Plateau of southern China; and the  
 65 Three Gorges in far eastern region located in Yunnan of China. The HKH features great heterogeneity  
 66 from north to south and east to west in relation to precipitation, vegetation, and human livelihoods.  
 67 This variability defy making easy generalizations about the region.



68  
 69 **Figure 1:** The Hindu Kush–Himalayan region and 10 major river basins.

70

## 71 **KEY ISSUES OF THE HKH**

72 This assessment considers the key issues in the HKH in the context of related questions that draws  
73 regional attention, cooperation and policy solutions. The HKH is geologically fragile, they are young  
74 and rising mountains, usually vulnerable to erosion and landslides, even without human  
75 interference. The region is undergoing rapid change driven by stressors such as climate change and  
76 human conflicts, and factors like globalization, infrastructure development, migration, tourism and  
77 urbanization. The outcome of interplay of these complex drivers of change is challenging to predict  
78 but will have major consequences, not just in the region but globally. There is a critical need to assess  
79 these drivers' potential cost to the HKH environment and human wellbeing as well as the  
80 opportunities they may present. From a policy standpoint, achieving food, water, energy, and  
81 livelihood security in the region will require exploring scenarios based on different assumptions so  
82 that the scientific community, policy-makers, the private sector, and community stakeholders can  
83 come together and make optimal governance decisions to sustain this global asset. It will also require  
84 country-specific recommendations to guide national-level policy-making.

## 85 **OVERALL OBJECTIVE, RATIONALE AND KEY QUESTIONS**

### 86 **Overall objective**

87 This assessment aims to (1) establish the global significance of the HKH, (2) reduce scientific  
88 uncertainty on various mountain issues, (3) lay out practical and up-to-date solutions and offer new  
89 insights for development of this region, (4) value and conserve existing ecosystems, cultures,  
90 societies, knowledge, and distinctive HKH solutions that are important to the rest of the world, (5)  
91 addresses contemporary policy questions, and (6) influence policy processes with robust evidence for  
92 sustainable mountain development.

93 An assessment is distinct from a review. Whereas research speaks to other scientists in a particular  
94 field, assessments critically evaluate current states of knowledge about a topic with an aim to  
95 develop policy-oriented solutions, and inform relevant decision-makers across sectors. Assessments  
96 are structured to address specific social problems by translating science into forms that are salient,  
97 legitimate, and credible to wider audiences (Clark, Mitchell and Cash, 2006). Nevertheless,  
98 assessment also give due importance to reducing scientific uncertainty. The target audiences for this  
99 assessment are those who make decisions on investments and management regarding mountain  
100 development, that is, policy-makers, government agencies, academics, natural resource managers,  
101 private-sector investors, and civil-society members. In addition, our assessment aims to inform the  
102 general public about important mountain issues so that everyone can help to make better decisions  
103 through political processes in HKH countries.

### 104 **Rationale for the assessment**

105 In 2007, the Intergovernmental Panel on Climate Change (IPCC's) fourth assessment report  
106 (Pachauri and Reisinger 2007) predicted that climate change will be the most prominent driver of  
107 global change in the 21<sup>st</sup> century and pointed to the lack of consistent long-term monitoring in the  
108 HKH. The report called for national, regional, and global efforts to fill this data gap. Little progress  
109 was made in the HKH by the time of the IPCC's fifth assessment report (Pachauri and Meyer 2014).  
110 While universities, nongovernmental organizations, and scientific organizations have made strides in

111 assembling and consolidating data, information about the HKH collectively remains too fragmented  
112 and incomplete to derive any meaningful conclusions about trends and scenarios.

113 The Hindu Kush Himalayan Monitoring and Assessment Programme (HIMAP), which brings together  
114 hundreds of scientists and experts from the fields, from the region and around the world, aims to  
115 address these knowledge gaps and propose a way forward. A comprehensive assessment that goes  
116 beyond climate change is expected to greatly assist efforts to address threats and act on  
117 opportunities, and gives importance to upscale cutting-edge approaches. HIMAP derives inspiration  
118 from the Arctic Monitoring and Assessment Programme, which has systematically generated  
119 meaningful data and analysis about key trends and future scenarios in the Arctic region.

### 120 **Key questions**

121 A set of questions relevant for the assessment was developed first by analyzing the key issues of the  
122 HKH region. The assessment was designed in a way that each chapter team considered key relevant  
123 questions in writing their chapters.

124 HIMAP has considered following critical questions:

- 125 • What are the most important drivers of change in the HKH, and what are their potential  
126 impacts on biodiversity, ecosystem services, livelihoods, and water resources?
- 127 • What are the most important strategies, policies, and governance arrangements for  
128 enhancing community adaptation to drivers of change, including climate change; how can  
129 they be out-scaled; and what are their impacts?
- 130 • How do gender-equitable and inclusive approaches support sustainable mountain  
131 development, and how can these be realized?
- 132 • What migration trends exist in the region, what are their present impacts on livelihoods and  
133 the environment, and what are the options for addressing migration and the likely  
134 consequences of those options?
- 135 • What is the existing status of the cryosphere, what changes are likely, and what are the  
136 potential impacts of those changes?
- 137 • What is the current and likely future quantity, variability, and quality of the water in the 10  
138 major river basins of the HKH; what are the potential impacts of change; and how can  
139 negative impacts be mitigated?
- 140 • What are the best means of reducing the risk of floods and droughts, and how can they be  
141 introduced at various scales, including on Transboundary Rivers?
- 142 • What are the energy needs and possibilities for the people of the HKH, what are the positive  
143 and negative impacts of hydropower development, and how can hydropower best be  
144 sustainably developed in the region?
- 145 • How can ecosystems be managed to support both biodiversity conservation and improved  
146 livelihoods in the various contexts found in the HKH?
- 147 • What ecosystem services do mountains provide, and how can management and supply of  
148 these services be compensated?

- 149 • What watershed-, landscape-, and forestry-based approaches will best support ecosystem  
150 services, food and water security, and community resilience?
- 151 • How can the HKH develop a green economy? What technologies (modern, traditional, and  
152 indigenous) and approaches are best suited for sustainable mountain development in the  
153 region, and how can they be out-scaled?

## 154 VISION

155 The assessment foresaw the key issues of the region, drew 12 critical questions for addressing the  
156 identified issues, and both the issues and questions were used in formulating the vision of the  
157 assessment: *To enable a prosperous, peaceful, and poverty-free people; food, energy, environment and  
158 water secure people; and climate- and disaster-resilient mountain communities for the region and the  
159 world.*

- 160 1) Prosperous – wellbeing in terms of productive and dignified, social (quality of life, social  
161 capital, healthy), cultural (identity plus integration), and environment (clean air, water,  
162 pollution management, and healthy natural resource base)
- 163 2) Equality of access to opportunities and benefits of resources for everyone regardless gender  
164 and social class
- 165 3) Food security – healthy people with access to adequate, affordable, good quality and  
166 nutritious food
- 167 4) Energy security – access to adequate amount of energy that is affordable, and sustainable,  
168 without unduly affecting the present low carbon status.
- 169 5) Water security – access to quality, affordable water; and protection from extreme events  
170 such as floods and droughts
- 171 6) Vibrant and bio-diverse ecosystem services for people to support culture and economies;  
172 protection and wise use of ecosystem services
- 173 7) Climate and disaster resilient communities and countries; contributing to mitigation and  
174 adaptation; means – finance, capacity building, knowledge and technology
- 175 8) Cooperation at all levels (people to people, business to business, government to government)  
176 between countries for sustainable and mutual benefits to achieve vision
- 177 9) HKH with unrestricted people movement across the countries.

178

## 179 HKH PRIORITIES CONTRIBUTING TO SUSTAINABLE DEVELOPMENT GOALS

180 Considering the issues, questions and vision as part of this assessment, we drafted our chapters and  
181 key messages in line with the United Nations' Sustainable Development Goals (SDGs). In this way,  
182 our "Priorities for Mountains and People of the HKH" reflect the ideals and inspiration of the SDGs.  
183 We created this complementarity through a three-step exercise:

184 (a) Define HKH priorities, align them with SDGs and refer to relevant HIMAP assessment  
185 chapters;

186 (b) Define HKH specific targets for 2030;

187 (c) Identify suitable indicators derived from the list of proposed SDG indicators; and indicate  
188 data availability.

189 Table 1 lays out the relationship between HKH priorities and the SDG framework.

## 190 **CONCEPTUAL FRAMING OF THE ASSESSMENT**

191 The concept of the assessment was logically developed step by step by framing of key issues,  
192 identifying critical questions to address the issues and visioning of the exercise and identifying nine  
193 priorities that could contribute to 2030 SDGs.

194 Our assessment addresses the economic, environmental and social pillars of sustainable mountain  
195 development and will serve as a basis for evidence-based decision-making to safeguard the  
196 environment and advance people's wellbeing. This report will not be a one-time publication. It is  
197 planned as the first of a series of monitoring and assessment reports about the HKH.

198 In spite of vast expanse of mountains and their importance in the world, as a unique and exclusive  
199 land form, they have been largely ignored within better known environmental assessments such as  
200 the IPCC and Millennium Ecosystem Assessment. In these assessments, mountains are not examined  
201 in detail: scientific knowledge is scattered and traditional indigenous knowledge systems are mostly  
202 absent. This assessment intends to fill those gaps and provide information for improved decision  
203 making in the HKH. The HIMAP intends to provide a connection of this region in global assessments  
204 such as IPCC AR 6 and subsequent ones and IPBES, and intends to contribute to global targets like  
205 2030 SDG goals and 1.5 Degree World after Paris UNFCCC 2015 agreement.

206 The assessment chapters consider status, trends and scenarios, and come up with recommendations  
207 that build into key policy messages. This assessment focuses on various drivers of change all of  
208 which are influenced by impacts of climate change. Mountain people and ecosystems tend to  
209 experience change more rapidly and with greater intensity. Mountain regions are no longer isolated  
210 from globalization. The HKH's biodiverse resources, rich indigenous knowledge systems, and  
211 enormous reservoirs of water provide vibrancy to the region and beyond. Understanding how these  
212 features may change over time is extremely important. In response, we devote many pages of this  
213 assessment to considering alternative development pathways and discussing ideas for enhancing  
214 regional cooperation in the HKH for sustainable mountain development.

## 215 **ASSESSMENT PROCESS**

216 The International Centre for Integrated Mountain Development (ICIMOD) coordinated HIMAP,  
217 constituted the chapter author teams and the process was steered by policy decisions of the Steering  
218 Committee. The assessment process involved several rounds of Steering Committee meetings,  
219 workshops of Coordinating Lead Authors and Lead Authors including write-shops and peer inter-  
220 chapter reviews, subject expert reviews, and open reviews for anyone interested. Science-policy  
221 dialogues were organized to develop key policy messages. For this assessment, HIMAP has engaged

222 more than 300 researchers, practitioners, experts, and policy-makers. The publication of the first  
223 Comprehensive Assessment of the HKH in 2017 is planned as a wide-ranging, innovative evaluation  
224 of the current state of knowledge in the region and of various drivers of change and their impacts,  
225 and a set of practically oriented policy recommendations. The process is following these steps:

- 226 • Framing of the assessment: A framing workshop and consultations with various experts to  
227 define the structure and process of the assessment.
- 228 • Drafting of chapters: Based on the experience of other assessments, a network of people with  
229 in-depth knowledge of the region to draft the chapters.
- 230 • Peer review: Rigorously review the chapter drafts, both by peers and via open review.
- 231 • Dissemination: Using multiple channels, to communicate to a wide range of audiences  
232 during the process to draw attention while the assessment is still in preparation.
- 233 • Engagement with policy-makers: share with policy-makers in the region through various  
234 processes.
- 235 • Development of a summary document: A summary for decision-makers based on the results  
236 of the process.
- 237 • Publication and launch: Publication of the first edition of the assessment in 2017.

## 238 **OUTLINE OF THE ASSESSMENT**

239 Each chapter of the assessment address three broad themes within its particular confines:

- 240 (1) Defining the vision and state of knowledge;
- 241 (2) Drivers of change and integrated future scenarios; and
- 242 (3) Noting ideas and praxis for sustainable development.

243 The critical questions were used by each of the chapters to address the key issues of the region. The  
244 sixteen chapters include: Introduction - setting the scene: Drivers - local, regional, and global;  
245 Climate change in the HKH; Future scenarios; Sustaining HKH biodiversity and ecosystem services;  
246 Meeting future energy needs; The cryosphere; Water security - availability, use, and governance;  
247 Food and nutrition security; Air pollution; Disaster risk reduction and increasing resilience;  
248 Mountain poverty, vulnerability and livelihoods; Adaptation strategies; Gender and inclusive  
249 development; Migration; and Governance and institutions.

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**Table 1: Framework for SDG consistent priorities for mountains and peoples of the HKH**

SDG consistent priorities for the HKH	Targets	HKH Indicators (SDG indicators listed in parentheses)	HIMAP Assessment Corresponding Chapter	Link with most relevant SDG
<p><b>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</b></p>	<ul style="list-style-type: none"> <li>· Reduce income poverty to zero in mountain areas by 2030.</li> <li>· Reduce non-income poverty including health, education, and other basic needs to zero in mountain areas by 2030.</li> <li>· Achieve universal health coverage, access to quality healthcare services and access to safe, effective, quality, and affordable essential medicines and vaccines for all people in the mountains.</li> <li>· All girls and boys in the mountains complete free, equitable and quality primary and secondary education.</li> </ul>	<ul style="list-style-type: none"> <li>· Proportion of <i>mountain</i> population below the international poverty line (= \$1.25 a day), by sex, age, employment status and geographical location (urban/rural) (1.1.1)</li> <li>· Proportion of <i>mountain</i> men, women and children of all ages living in poverty in all its dimensions according to national definitions (1.2.2)</li> <li>· Proportion of <i>mountain</i> population covered by social protection floors/systems, by sex, distinguishing children, unemployed persons, older persons, persons with disabilities, pregnant women, new-borns, work-injury victims and the poor and the vulnerable (1.3.1)</li> <li>· Proportion of <i>mountain</i> population living in households with access to basic services (sanitation, health, education) (1.4.1)</li> <li>· Proportion of total adult <i>mountain</i> population with secure tenure rights to land, with legally recognized documentation and who perceive their rights to land as secure, by sex and by type of tenure (1.4.2)</li> <li>· Mortality rate attributed to household and ambient air pollution (3.9.1)</li> <li>· Proportion of <i>mountain</i> youth (aged 15-24 years) not in education, employment or training (8.6.1)</li> </ul>	<ul style="list-style-type: none"> <li>· HKH drivers of change (3)</li> <li>· Air pollution (11)</li> <li>· Disaster risk reduction and increasing resilience (12)</li> <li>· Mountain poverty vulnerability and livelihoods (13)</li> <li>· Gender and inclusive development (15)</li> <li>· Migration (16)</li> </ul>	<p><b>Goal 1.</b> End poverty in all its forms everywhere</p> <p><b>Goal 3.</b> Ensure healthy lives and promote well-being for all at all ages</p> <p><b>Goal 4.</b> Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all</p>

		<ul style="list-style-type: none"> <li>· Proportion of the rural <i>mountain</i> population who live within 2 km of an all-season road (9.1.1)</li> <li>· Proportion of <i>mountain</i> population that has convenient access to public transport, by sex, age and persons with disabilities (11.2.1)</li> </ul>		
<p><b>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</b></p>	<ul style="list-style-type: none"> <li>· End all forms of malnutrition in the mountains and improve food and nutrition security, particularly for women and girl children</li> <li>· Increase investment in rural infrastructure, agricultural research, technology development, and plant and livestock gene banks in the mountains to improve agricultural productive capacity</li> <li>· Enable higher incomes for small-scale farmers, including women farmers</li> <li>· Achieve sustainable management and efficient use of natural resources</li> </ul>	<ul style="list-style-type: none"> <li>· Prevalence of undernourishment by sex and age (2.1.1)</li> <li>· Prevalence of malnutrition by sex and age (2.2.2)</li> <li>· Average income of small-scale food producers, by sex and indigenous status (2.3.2)</li> </ul>	<ul style="list-style-type: none"> <li>· Food and nutrition security (10)</li> <li>· Disaster risk reduction and increasing resilience (12)</li> <li>· Mountain poverty vulnerability and livelihoods (13)</li> <li>· Adaptation strategies (14)</li> <li>· Gender and inclusive development (15)</li> </ul>	<p><b>Goal 2.</b> End hunger, achieve food security and improved nutrition and promote sustainable agriculture</p> <p><b>Goal 12.</b> Ensure sustainable consumption and production patterns</p>
<p><b>Achieve gender and social equity through inclusive and transformative change in the mountains</b></p>	<ul style="list-style-type: none"> <li>· Eliminate all forms of violence against all women and girls</li> <li>· Ensure women’s effective participation and equal opportunities for leadership at</li> </ul>	<ul style="list-style-type: none"> <li>· Proportion of government recurrent and capital spending to sectors that disproportionately benefit women, the poor and vulnerable groups (1.b.1)</li> <li>· Participation rate of youth and adults in formal and non-formal education and training in the previous</li> </ul>	<ul style="list-style-type: none"> <li>· Sustaining HKH Biodiversity and Ecosystem Services (6)</li> <li>· Meeting Future Energy Needs in the HKH (7)</li> </ul>	<p><b>Goal 5.</b> Achieve gender equality and empower all women and girls</p> <p><b>Goal 10.</b> Reduce inequality within and</p>

	<p>all levels of decision-making in political, economic and public life.</p> <ul style="list-style-type: none"> <li>· Increase number of women in institutions by at least 100%, particularly at the decision-making levels.</li> <li>· Adopt and strengthen policies and legislation for the promotion of gender equality and the empowerment of all women and girls at all levels, with a focus on mountains</li> <li>· Eliminate gender disparities in education in the mountains.</li> <li>· Empower and promote the social, economic and political inclusion of all irrespective of age, sex, race, ethnicity, origin, religion or economic or other status.</li> </ul>	<p>12 months, by sex (4.3.1)</p> <ul style="list-style-type: none"> <li>· Whether or not legal frameworks are in place to promote, enforce and monitor equality and non-discrimination on the basis of sex (5.1.1)</li> <li>· Proportion of total agricultural population with ownership or secure rights over agricultural land, by sex; and share of women among owners or rights-bearers of agricultural land, by type of tenure (5.a.1)</li> <li>· Growth rates of household expenditure or income per capita among the bottom 40 per cent of the population and the total population (10.1.1)</li> <li>· Proportions of positions (by sex, age, persons with disabilities and population groups) in public institutions (national and local legislatures, public service, and judiciary) compared to national distributions (16.7.1)</li> <li>· Proportion of population who believe decision-making is inclusive and responsive, by sex, age, disability and population group (16.7.2)</li> </ul>	<ul style="list-style-type: none"> <li>· Water availability and use (9)</li> <li>· Food and nutrition security (10)</li> <li>· Air pollution (11)</li> <li>· Disaster risk reduction and increasing resilience (12)</li> <li>· Mountain poverty vulnerability and livelihoods (13)</li> <li>· Adaptation strategies (14)</li> <li>· Gender and inclusive development (15)</li> <li>· Migration (16)</li> <li>· Governance and Institutions (17)</li> </ul>	<p>among countries</p> <p><b>Goal 16.</b> Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels</p>
<p><b>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</b></p>	<ul style="list-style-type: none"> <li>· Create secure water supply for key development sectors (agriculture, energy) that are viable year-round</li> <li>· Build effective and efficient mechanisms to implement and monitor transboundary cooperation agreements.</li> <li>· Achieve universal and</li> </ul>	<ul style="list-style-type: none"> <li>· Proportion of <i>mountain</i> population (disaggregated by sex, age and social categories) using safely managed drinking water services (6.1.1)</li> <li>· Proportion of <i>mountain</i> population (disaggregated by sex, age and social categories) using safely managed sanitation services, including a hand-washing facility with soap and water (6.2.1)</li> <li>· Level of water stress: freshwater withdrawal as a proportion of available freshwater resources (6.4.2)</li> </ul>	<ul style="list-style-type: none"> <li>· Climate change in the HKH (4)</li> <li>· Status and change in the cryosphere (8)</li> <li>· Water availability and use (9)</li> <li>· Food and nutrition security (10)</li> </ul>	<p><b>Goal 6.</b> Ensure availability and sustainable management of water and sanitation for all</p> <p><b>Goal 13.</b> Take urgent action to combat climate change and its impacts</p>

	<ul style="list-style-type: none"> <li>· equitable access to safe and affordable drinking water to all mountain people by 2030.</li> <li>· Achieve access to adequate and equitable sanitation services and hygiene education for all in mountain regions.</li> <li>· Reduce women and children’s water collecting time and work load by 2030</li> <li>· Support and strengthen the participation of mountain communities in water management</li> </ul>	<ul style="list-style-type: none"> <li>· Proportion of transboundary basin area with an operational arrangement for water cooperation (6.5.2)</li> <li>· Proportion of men and women in the decision-making levels in water and climate related institutions</li> </ul>	<ul style="list-style-type: none"> <li>· Disaster risk reduction and increasing resilience (12)</li> <li>· Mountain poverty vulnerability and livelihoods (13)</li> <li>· Adaptation strategies (14)</li> <li>· Gender and inclusive development (15)</li> <li>· Migration (16)</li> <li>· Governance and Institutions (17)</li> </ul>	
<p><b>Universal access to clean energy in the mountains from sources that are affordable, reliable, and sustainable</b></p>	<ul style="list-style-type: none"> <li>· Universal access to clean and affordable energy by the people in the mountains</li> <li>· Increase electrification in rural areas</li> <li>· Increase use of renewable energy</li> <li>· Decrease air pollution</li> <li>· Increase access of energy for women decreasing their workload, time and drudgery</li> </ul>	<ul style="list-style-type: none"> <li>· Mortality rate attributed to household and ambient air pollution (3.9.1)</li> <li>· Proportion of mountain population (disaggregated by sex and social categories) with access to electricity (7.1.1)</li> <li>· Proportion of mountain population (disaggregated by sex and social categories) with primary reliance on clean fuels and technology (7.1.2)</li> <li>· CO2 emission per unit of value added (9.4.1)</li> <li>· Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted) (11.6.2)</li> </ul>	<ul style="list-style-type: none"> <li>· Climate change in the HKH (4)</li> <li>· Status and change in the cryosphere (8)</li> <li>· Air pollution (11)</li> </ul>	<p><b>Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all</b></p>

<p><b>Halt biodiversity loss, land degradation and sustainably manage forests and ecosystems in the mountains to enhance ecosystem resilience for sustained flow of services</b></p>	<ul style="list-style-type: none"> <li>· Ensure the conservation of mountain ecosystems, including their biodiversity.</li> <li>· Take urgent action to end poaching and trafficking of protected species of flora and fauna in the mountains.</li> <li>· Reduce ecosystem degradation by development projects by 50%</li> <li>· Include ecosystem values in national accounting practices</li> <li>· Increase investment in biodiversity conservation, and ecosystem adaptation and services by 50% by 2030</li> <li>· Ensure 100% community participation in biodiversity programmes at the local level</li> <li>· Increase women’s participation in decision making processes by 50% in natural resource access and benefit sharing programmes</li> <li>· Establish a mountain specific database for species and ecosystem services</li> </ul>	<ul style="list-style-type: none"> <li>· Change in the extent of ecosystems over time (6.6.1)</li> <li>· Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type (15.1.2)</li> <li>· Proportion of land that is degraded over total land area (15.3.1)</li> <li>· Coverage by protected areas of important sites for mountain biodiversity (15.4.1)</li> <li>· Mountain Green Cover Index (indicator to measure changes of green vegetation in mountain areas, informed by satellite imagery data) (15.4.2)</li> <li>· Red List Index (endangered species) (15.5.1)</li> <li>· Official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems (15.b.1)</li> <li>· Number of countries that have adopted legislative, administrative and policy frameworks to ensure fair and equitable sharing of benefits (of use of genetic or other natural resources) (15.6.1)</li> </ul>	<ul style="list-style-type: none"> <li>· Sustaining HKH Biodiversity and Ecosystem Services (6)</li> </ul>	<p><b>Goal 15.</b> Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss</p>
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<p><b>Ensure sustainable adaptation to climate change and disaster risk reduction for the mountains through evidence-based decision making</b></p>	<ul style="list-style-type: none"> <li>· Concerted action to keep global level climate change to 1.5 degrees by 2100.</li> <li>· Strengthen resilience and adaptive capacity to climate related hazards and natural disasters in the mountains.</li> <li>· Reduce mortality rates, especially for women and children due to extreme climate events</li> <li>· Reduce economic loss due to extreme climate events</li> <li>· Integrate mountain specific climate change measures into national policies, strategies and planning</li> </ul>	<ul style="list-style-type: none"> <li>· Number of deaths, missing persons and persons affected by disaster per 100,000 people (disaggregated by sex) (1.5.1)</li> <li>· Direct disaster economic loss in relation to global GDP, including disaster damage to critical infrastructure and disruption of basic services (11.5.2)</li> <li>· Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030 (11.b.1)</li> </ul>	<ul style="list-style-type: none"> <li>· Status and change in the cryosphere (8)</li> <li>· Disaster risk reduction and increasing resilience (12)</li> <li>· Adaptation strategies (14)</li> </ul>	<p><b>Goal 13.</b> Take urgent action to combat climate change and its impacts</p> <p><b>Goal 11.</b> Make cities and human settlements inclusive, safe, resilient and sustainable</p> <p><b>Goal 1.</b> End poverty in all its forms everywhere</p>
<p><b>Build resilient, equitable and inclusive mountain communities empowered by economic opportunity and investment in mountain infrastructure</b></p>	<ul style="list-style-type: none"> <li>· Develop sustainable and resilient infrastructure in the mountains to support economic development and human well-being</li> <li>· Sustain per capita economic growth in the mountains and at least 7% annual GDP growth</li> <li>· Devise and implement mountain specific policies to promote sustainable mountain tourism, which creates local</li> </ul>	<p>See SDG indicators for:</p> <ul style="list-style-type: none"> <li>· Poverty eradication</li> <li>· Gender equality and inclusive development</li> <li>· Climate change adaptation (CCA) and disaster risk reduction (DRR)</li> </ul>	<ul style="list-style-type: none"> <li>· Mountain poverty vulnerability and livelihoods (13)</li> <li>· DRR and increasing resilience (12)</li> <li>· Adaptation strategies (14)</li> <li>· Gender and Inclusive Development (15)</li> </ul>	<p><b>Goal 8.</b> Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all</p> <p><b>Goal 9.</b> Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation</p>

	<p>jobs, promotes local culture and products</p> <ul style="list-style-type: none"> <li>· Achieve full and productive employment and decent work for all women and men in the mountains, and equal pay for work of equal value.</li> </ul>			<p><b>Goal 11.</b> Make cities and human settlements inclusive, safe, resilient, and sustainable</p>
<p><b>Promote a mountain-specific agenda for achieving the SDGs through increased regional cooperation among and between mountain regions and nations</b></p>	<ul style="list-style-type: none"> <li>· Cooperate at all levels across the HKH for sustainable and mutual benefits.</li> <li>· Enhance regional and international cooperation and access to science, technology and innovation to achieve the SDGs in mountain areas</li> <li>· In national, regional, and global decision making institutions and processes, recognize and prioritize the uniqueness of the HKH mountains and its people. Ensure representation in decision-making.</li> <li>· Allocate significantly greater resources and identify incentives for conservation of benefits from mountain ecosystems.</li> </ul>		<ul style="list-style-type: none"> <li>· Governance and Institutions (17)</li> </ul>	<p><b>Goal 17.</b> Revitalize the global partnership for sustainable development</p>