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Sustainable development

Sustainable mountain development

Report of the Secretary-General

Summary

Covering around one quarter of the Earth's surface, mountains are key ecosystems that provide humanity with essential goods and services such as water, food, biodiversity and energy. However, mountain ecosystems are severely and increasingly affected by biodiversity loss, climate change and land degradation. As of 2017, mountains were home to about 1.1 billion people. People in mountain areas are among the world's poorest: in 2017, half of rural mountain dwellers living in developing countries faced food insecurity. Access to services and infrastructure is lower in mountains than in other areas. Mountain communities are highly dependent on predominantly small-scale and family-based agriculture. In the mountains, exposure to natural hazards, lack of key services and impacts of crises and conflicts are factors contributing to the high vulnerability of populations. The coronavirus disease (COVID-19) pandemic has further disrupted life in mountains and compounded the vulnerabilities of mountain communities. The human health crisis is aggravating the unfolding and interconnected emergencies associated with climate change, biodiversity loss, land degradation and pollution in mountains. Identifying new and sustainable livelihood opportunities and adopting practices that combat land degradation and promote climate change adaptation and resilient agrifood systems are urgent requirements for achieving the Sustainable Development Goals and reducing outmigration trends. The present report includes some recommendations on actions to accelerate progress towards inclusive, resilient and sustainable mountain development.

* [A/77/150](#).



I. Introduction

1. The present report of the Secretary-General is submitted pursuant to General Assembly resolution 74/227. The report was prepared by the Food and Agriculture Organization of the United Nations (FAO) and the Mountain Partnership Secretariat, with inputs from Governments, relevant agencies of the United Nations system and other organizations.
2. With less than eight years remaining to implement the 2030 Agenda for Sustainable Development, it is necessary to accelerate efforts to identify solutions to the world's biggest challenges, including in mountains. Mountain stakeholders have implemented actions at all levels, as described in the present report, to build the resilience of mountain communities, promote sustainable food systems and increase the conservation and restoration of mountain resources, with the goal of leaving no one behind.
3. Alongside International Mountain Day and the United Nations Decade of Family Farming, already established, the proclamations establishing 2022 as the International Year of Sustainable Mountain Development, 2026 as the International Year of Rangelands and Pastoralists and 2021–2030 as the United Nations Decade on Ecosystem Restoration provide opportunities for raising public awareness of mountain issues and mobilizing political and financial commitments.
4. The present report serves to highlight four interrelated areas on which multi-stakeholder action should focus to contribute to the implementation of the 2030 Agenda in mountains through integrated, context-specific, long-term approaches based on sustainability, resilience, COVID-19 recovery and inclusiveness.

II. Background and challenges

5. Covering around one quarter of the world's land surface, mountains are key ecosystems, providing goods and services to the entire planet and supporting the livelihoods of a vast number of people.¹ Mountains are of paramount importance as water towers for people in the mountains and for around 2 billion people living in connected lowland areas.² They also host 25 per cent of terrestrial biodiversity.³
6. Mountain ecosystems are highly vulnerable to climate change, extreme weather events, deforestation, land degradation, pollution and natural disasters, from which they recover slowly.⁴
7. Mountains are at risk from uncontrolled dumping and open burning of waste, including plastic waste.⁵

¹ Rosalaura Romeo and others, *Vulnerability of Mountain Peoples to Food Insecurity: Updated Data and Analysis of Drivers* (Rome, FAO and United Nations Convention to Combat Desertification, 2020).

² Walter W. Immerzeel and others, "Importance and vulnerability of the world's water towers", *Nature*, 577, 364–369 (2020); Daniel Viviroli and others, "Increasing dependence of lowland populations on mountain water resources", *Nature Sustainability*, 3, 917928 (2020).

³ Thomas Kohler and others, *Green Economy and Institutions for Sustainable Mountain Development: From Rio 1992 to Rio 2012 and Beyond* (Centre for Development and Environment, Swiss Agency for Development and Cooperation, University of Geneva and Geographica Bernensia, 2015). Available at <https://archive-ouverte.unige.ch/unige:74186>.

⁴ Rosalaura Romeo and others, *Vulnerability of Mountain Peoples to Food Insecurity*.

⁵ United Nations Environment Programme (UNEP), *Waste Management Outlook for Mountain Regions: Sources and Solutions* (2016). Available at <https://wedocs.unep.org/handle/20.500.11822/16794>.

8. The COVID-19 pandemic and the restrictions adopted by countries to respond to it have affected, among other areas, mountain agriculture, supply chains, small and medium-sized enterprises, and tourism.⁶

9. Mountain agriculture is usually on a small scale and based on family farming. It plays a key role in ensuring household food security, and in shaping mountain landscapes and conserving natural resources and biodiversity. Family farming communities, and in particular indigenous peoples in mountains, are custodians of spiritual and cultural values and site-specific knowledge.

10. According to a 2020 study, the number of people living in rural mountain areas in developing countries who are vulnerable to food insecurity has continued to increase in recent years. As of 2017, mountains were home to about 1.1 billion people, representing around 15 per cent of the global population. In rural mountain areas in developing countries, about 340 million people – 55 per cent of the total rural mountain population – were considered vulnerable to food insecurity in 2017, compared with an estimated 300 million – 53 per cent of the total rural mountain population – in 2012.⁷

11. Poverty, conflicts, inequalities and limited access to such basic services as transport, education, health care and markets reduce the resilience of people living in rural mountain areas to crises and shocks, often leading to outmigration.⁸

12. Water supply is an important health determinant; climate-related changes in water supply in the highlands will also affect populations living downstream.⁹

13. Tourism represents a source of income and economic opportunity for remote rural mountain communities. Mountain destinations attract around 15–20 per cent of global tourism.¹⁰ However, tourism can also be associated with potentially negative environmental, social and cultural impacts, as addressed, for example, in the Glasgow Declaration on Climate Action in Tourism.

14. There are gaps in the data available to inform understanding of local climate change risks and appropriate adaptation actions in mountain areas. Without adequate information on future climate risks, planning for adaptation programmes in mountains is compromised.

III. Mountains and the 2030 Agenda for Sustainable Development

15. The 2030 Agenda includes the following three targets that directly address sustainable mountain development:

(a) Target 6.6: By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes;

(b) Target 15.1: By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular

⁶ International Centre for Integrated Mountain Development, *COVID-19 impact and policy responses in the Hindu Kush Himalaya* (2020).

⁷ Rosalaura Romeo and others, *Vulnerability of Mountain Peoples to Food Insecurity*.

⁸ Ibid.

⁹ World Health Organization, Regional Office for South-East Asia, *Human health impacts from climate variability and change in the Hindu Kush-Himalaya region: report of an inter-regional workshop* (2006).

¹⁰ UNEP, *Tourism and Mountains: A Practical Guide to Managing the Environmental and Social Impacts of Mountain Tours* (2007).

forests, wetlands, mountains and drylands, in line with obligations under international agreements;

(c) Target 15.4: By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development.

16. In the ministerial declaration adopted at the 2021 high-level political forum on sustainable development (A/76/3, chap. VI, sect. E), the Ministers and high representatives noted with concern that the Goal targets with a 2020 deadline have not been fully achieved and committed to maintain the integrity of the 2030 Agenda and achieve those targets in an accelerated time frame, reflecting the urgency conveyed in the 2030 Agenda, while keeping track of and taking fully into account the related ongoing intergovernmental processes to allow updated targets to reflect a suitable level of ambition for 2030.

17. Target 15.4 of the Sustainable Development Goals is the only target entirely dedicated to mountains. FAO is the custodian agency of indicator 15.4.2, the Mountain Green Cover Index, which monitors how mountain ecosystems evolve and assesses their state of conservation and health. According to the latest global baseline, between 2000 and 2020, 73 per cent of the world's mountain areas were covered by a form of green vegetation,¹¹ and 39 per cent of the entire mountain area was covered in forests.¹² The United Nations Environment Programme (UNEP), together with the International Union for Conservation of Nature and BirdLife International, are the custodian agencies for indicator 15.4.1, which monitors coverage by protected areas of important sites for mountain biodiversity.¹³ Between 2000 and 2020, coverage by protected areas of important sites for mountain biodiversity increased from 28 to 41 per cent.¹⁴

18. The lack of localized and disaggregated data on mountains, including gender disaggregated data, continues to be a challenge for providing policy advice and developing adequate policies.

19. In its resolution 76/129, the General Assembly proclaimed 2022 the International Year of Sustainable Mountain Development, at the proposal of the Government of Kyrgyzstan and 20 years after the International Year of Mountains, 2002. The resolution was sponsored by 94 Governments and was adopted by the Assembly on 16 December 2021. Kyrgyzstan has proposed that a five-year action plan (2023–2027) for the development of mountain regions be considered as an outcome of the International Year of Sustainable Mountain Development, 2022.

20. Also at its seventy-sixth session, the General Assembly adopted resolution 76/253, declaring 2026 the International Year of Rangelands and Pastoralists, at the proposal of Mongolia. Over half of the Earth's land surface is classified as rangelands, which are critical to the livelihoods of 500 million pastoralists. Many rangelands are located in mountains. The observance of the International Year is intended to raise awareness and fill knowledge gaps globally about the considerable benefits provided by healthy rangelands and sustainable pastoralism.

¹¹ FAO, *Tracking Progress on Food and Agriculture-related SDG Indicators 2021: A Report on the Indicators under FAO Custodianship* (Rome, FAO, 2021).

¹² See <https://www.fao.org/mountain-partnership/internationalyear2022/communication-toolkit/key-messages/en/>.

¹³ UNEP, "SDG indicator metadata". Available at <https://unstats.un.org/sdgs/metadata/files/Metadata-15-04-01.pdf>.

¹⁴ UNEP, "Mountain KBAs completely covered by protected areas". Available at https://wesr.unep.org/sdg/country_profile/globalindicator1541.html?country=GL.

A. Climate change

21. Climate change is negatively affecting food security, agriculture and the provision of ecosystem services across many different mountainous regions worldwide. As an effect of widespread glacier shrinkage, the high mountains of the world are currently experiencing a historically unparalleled, large-scale environmental transformation, with profound and far-reaching impacts on landscapes, ecosystems and people.¹⁵

22. Snow cover, glaciers and permafrost in mountain areas are projected to continue declining in almost all regions throughout the twenty-first century. This situation has implications for water supply in lowlands, such as reduced river flow in summer and dry seasons, affecting large irrigation schemes.¹⁶

23. The current pace, depth and scope of adaptation is insufficient to address future climate risks in mountain regions, particularly at higher warming levels above 1.5°C. The need for adaptation to address key risks in mountains is becoming increasingly urgent.

24. The impact of climate change on mountain ecosystems and communities has been examined by the Intergovernmental Panel on Climate Change, as part of the sixth assessment cycle, in Cross-Chapter Paper 5: Mountains, published in 2022.¹⁷ The Mountain Research Initiative, an international research coordination network, assisted in convening authors and coordinating their contributions to that paper.

25. The Group on Earth Observations (GEO) Global Network for Observations and Information in Mountain Environments, known as GEO Mountains, is a GEO Work Programme Initiative that seeks to increase the discoverability, accessibility and usability of a wide range of mountain data and information. It is co-led by the Mountain Research Initiative and the National Research Council of Italy. Recent outputs include the GEO Mountains Inventory of In Situ Observational Infrastructure and the GEO Mountains General Inventory.

26. The High Mountain Summit convened by the World Meteorological Organization in 2019 produced a Call to Action¹⁸ that included a road map for developing science-based, user-driven knowledge and information systems to support sustainable development and risk reduction in mountainous and downstream regions.

27. The Mountain Societies Research Institute of the University of Central Asia, working together with the Aga Khan Foundation Afghanistan, has continued to implement a climate change adaptation project in Afghanistan, with a view to improving the climate resilience of communities and ecosystems in the Panj-Amu River Basin and enhancing the sustainable use of the local ecosystems by mapping the areas that are at risk of landslides.

28. The Adaptation at Altitude programme funded by the Swiss Agency for Development and Cooperation is a global partnership working to increase the resilience and adaptive capacity of mountain areas in response to climate change through better data and information on impacts and adaptation, regional exchange, knowledge generation and policy mainstreaming. The programme also strengthens

¹⁵ Mountain Research Initiative, “Mountain glaciers: vanishing sources of water and life”.

Available at <https://www.mountainresearchinitiative.org/activities/communication-campaigns>.

¹⁶ Regine Hock and others, “High Mountain Areas”, in *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate*, Hans Otto Pörtner and others, eds. (Cambridge University Press, Cambridge, United Kingdom; New York, United States of America, 2019). Available at: <https://www.ipcc.ch/srocc/chapter/chapter-2/executive-summary/>.

¹⁷ Available at <https://www.ipcc.ch/report/ar6/wg2/>.

¹⁸ Available at <https://highmountainsummit.wmo.int/en/call-action>.

interregional and regional dialogue and mountain governance platforms in the Andes, East Africa, the South Caucasus and the Hindu Kush Himalaya. Recent outputs include synthesis reports of adaptation solutions implemented in the regions.¹⁹

29. A new scientific assessment of the so-called Third Pole in the high mountains of Central, East and South Asia has been conducted to investigate environmental changes and human impact on climate, freshwater bodies, ecosystems and biodiversity. It represents the first comprehensive study produced by UNEP in collaboration with the UNEP-International Ecosystem Management Partnership, the Third Pole Environment and the Pan-Third Pole Environment.²⁰ The study serves to examine the changes that have taken place over the past 2,000 years, highlighting the importance of interdisciplinary research to address threats affecting this environment today and in the near future.

30. The collaborative Global Mountain Safeguard Research programme is a scientific alliance between the United Nations University Institute for Environment and Human Security and Eurac Research, the aim of which is to contribute to the development of mountain communities that are resilient to natural and man-made hazards and disaster risks, to protect the wealth of biological and cultural diversity, and to support adaptive solutions and sustainable transformation processes in mountains. Initial projects include socio-ecological research in the Maloti-Drakensberg Mountains of South Africa and Lesotho and activities to increase the resilience of climate-affected communities in Kotayk, Armenia.

31. Inclusive, risk-informed urban planning enables effective climate action and long-term sustainable economic development. The Aga Khan Development Network and the Government of Tajikistan, with support from the Swiss State Secretariat for Economic Affairs, the European Union, the United Nations Human Settlements Programme (UN-Habitat) and the Government of Japan, are implementing disaster- and climate-resilient participatory planning approaches in Khorugh, Tajikistan. The project entails the development of a resilient town plan and investment in enabling infrastructure for water and sanitation, hazard mitigation and public spaces.

32. Extreme weather events are becoming more frequent and intense. PLANETech and Andorra Research + Innovation have launched a competition to identify technologies that can better predict, prevent, manage and facilitate recovery from wildfires, floods, storms, extreme temperatures and other such events.

B. Ecosystem restoration and protection

33. The United Nations Decade on Ecosystem Restoration was launched in June 2021 with the goal of preventing, halting and reversing the degradation of ecosystems worldwide. FAO and UNEP, the two United Nations agencies responsible for leading the implementation of the Decade in collaboration with other partners, are coordinating the launch and scaling up of restoration and protection programmes in mountain areas that adopt such nature-based solutions as watershed management, sustainable forest management, rangeland restoration, biodiversity conservation, agroforestry and agroecology for enhancing ecosystem health and human well-being.

¹⁹ For example: UNEP and GRID-Arendal, *Mountains ADAPT: Solutions from East Africa* (Nairobi, UNEP, 2022). Available at <https://wedocs.unep.org/bitstream/handle/20.500.11822/39787/MASEA.pdf>; UNEP and GRID-Arendal, *Mountains ADAPT: Solutions from the South Caucasus* (Nairobi, UNEP, 2022). Available at <https://wedocs.unep.org/bitstream/handle/20.500.11822/39788/MASSC.pdf>.

²⁰ UNEP, *A Scientific Assessment of the Third Pole Environment* (Nairobi, 2022).

34. The Scaling Up Mountain Ecosystem-based Adaptation programme (2017-2022) of the International Union for Conservation of Nature is aimed at reinforcing local capacities to achieve resilience, expanding and consolidating successful ecosystem-based adaptation measures and strengthening policy-enabling conditions to ensure the sustainability of the activities started during the flagship Ecosystems-based Adaptation in Mountains programme in Nepal, Peru and Uganda. In addition, the programme is being replicated in Bhutan, Colombia and Kenya, which are developing projects to benefit local communities through ecosystem-based adaptation measures, building wider support and generating finance for such adaptation within national Governments and international forums.

35. Dryland mountains, such as those in Central Asia, the Near East and North Africa, are particularly vulnerable to climate uncertainty and mismanagement. Dryland mountains support the livelihoods of growing populations that depend on the resources provided by trees, forests and rangelands in worrying scenarios of land degradation.

36. The FAO and Global Environment Facility (GEF) project on integrated natural resources management in drought-prone and salt-affected agricultural production landscapes in Central Asia and Turkey is piloting and scaling up sustainable land management approaches – such as the restoration of degraded pasture with fodder crops and endemic pasture crops, land rehabilitation through silvopastoral development, and the introduction of drought and salt-resistant fodder crops – and is supporting a participatory approach to sustainable pastureland management.

37. Since 2021, the Sustainable Forest Management Impact Program on Dryland Sustainable Landscapes initiative of FAO and GEF has been aimed at promoting climate-resilient integrated landscape management in Kazakhstan²¹ and Mongolia.²²

Watershed management

38. In its forthcoming publication entitled *Building Resilience into Watersheds: A Sourcebook*, FAO aims to address multiple risks and cascading effects in watershed management and build the resilience of agrifood systems through the systematic inclusion of a risk perspective in watershed management planning and implementation. The publication will underline the importance of understanding disaster and climate risks, adopting a landscape approach and targeting such vulnerable groups as women, youth, indigenous peoples and peoples living in mountain areas at all stages of planning and implementation of watershed management.

39. The project “Enhancing community resilience to climate change in mountain watersheds” (2020–2024), financed by the Ministry of Agriculture, Forestry and Fisheries of Japan and implemented by FAO, aims to enhance the capacities of institutions and communities in Peru and the Philippines for risk-based watershed management. The project has promoted risk assessments at the regional and community levels, conducted capacity development and demonstration activities for such risk mitigation measures as reforestation and forest conservation, and disseminated lessons learned.

²¹ FAO, “Kazakhstan Resilient Agroforestry and Rangeland Management Project”. Available at <https://www.fao.org/gef/dryland-sustainable-landscapes/dslkazakhstan>.

²² FAO, “Promoting Dryland Sustainable Landscapes and Biodiversity Conservation in the Eastern Steppe of Mongolia (Eastern Steppe project)”. Available at <https://www.fao.org/gef/dryland-sustainable-landscapes/dslmongolia>.

Disaster risk reduction

40. The costs of disasters in mountains are very high, including loss of life and assets, inaccessibility of areas for extended periods of time, and increased vulnerability and poverty. The Global Assessment Report on Disaster Risk Reduction 2022²³ highlights the urgency of giving priority to disaster risk reduction as a precondition for sustainable development. At the seventh session of the Global Platform for Disaster Risk Reduction, held in 2022, participants stressed the urgent need to adopt and improve early warning systems to reduce risks in view of the increasing number of disasters worldwide.

41. The Aga Khan Agency for Habitat has developed a comprehensive framework for mountain communities to assess their vulnerability and risk to multiple hazards and their future needs, in order to guide adaptive action to safeguard critical infrastructure and risk-informed land-use planning. The Agency is applying this approach to support over 2,000 mountain communities in South and Central Asia.

Biodiversity conservation

42. Mountains host about half of the world's biodiversity hotspots and 30 per cent of all key biodiversity areas, as well as vital genetic resources for locally adapted crops and livestock. The protection of mountain biodiversity is a critical step towards halting biodiversity loss and maintaining and restoring healthy ecosystems.

43. The conservation of mountain biodiversity is relevant to the post-2020 global biodiversity framework being negotiated under the Convention on Biological Diversity and its monitoring framework. To mainstream mountains in the post-2020 process, UNEP and such partners as the Global Mountain Biodiversity Assessment, the Mountain Research Initiative and GRID-Arendal, working in close coordination with the Mountain Partnership Secretariat, have developed two science policy briefs and an indicator set²⁴ including science-based policy recommendations, to give the protection of mountain biodiversity greater prominence on the global agenda, as well as to promote the review, update and implementation by 2030 of the Programme of Work on Mountain Biological Diversity of the Conference of the Parties to the Convention on Biological Diversity. A set of relevant informal events for mountain countries has been organized on the margins of the meetings of the Open-ended Working Group on the Post-2020 Global Biodiversity Framework.

44. The Global Mountain Biodiversity Assessment has released an updated version of its global mountain inventory.²⁵ The new version serves to introduce a hierarchical classification of the world's mountain ranges, which allows for the partitioning of mountain systems into smaller ranges and subranges and enables spatially explicit and comparative mountain research across scales. It represents a powerful tool for global mountain science and sustainable mountain development.

45. The first Southern African Mountain Conference, organized jointly by the Afromontane Research Unit of the University of the Free State, Global Mountain

²³ United Nations Office for Disaster Risk Reduction, *Global Assessment Report on Disaster Risk Reduction 2022: Our World at Risk: Transforming Governance for a Resilient Future. Summary for Policymakers* (Geneva, 2022). Available at <https://www.undrr.org/gar2022-our-world-risk#container-downloads>.

²⁴ UNEP and others, "Indicators for Elevating Mountains in the Convention on Biological Diversity's Post-2020 Global Biodiversity Framework". Available at <https://www.cbd.int/doc/c/7faf/b992/b56af5209ee53b159efffc22/sbstta-24-item3-unep-indicators-mountains-en.pdf>.

²⁵ Snethlage, M.A. and others, "A hierarchical inventory of the world's mountains for global comparative mountain science", *Nature Scientific Data* (2022); Snethlage, M.A. and others, "GMBA Mountain Inventory v2", *GMBA-EarthEnv*. (2022). Available at <https://www.earthenv.org/mountains>.

Safeguard Research and the African Mountain Research Foundation, was held in March 2022 in the Maloti-Drakensberg Mountains, South Africa, under the patronage of the United Nations Educational, Scientific and Cultural Organization (UNESCO). The Conference promoted the growth of an Africa-based community of practice to develop solutions, inform global research theory and practice, and contribute to policy and governance from an African perspective.

46. The UNEP Vanishing Treasures programme, financed by the Government of Luxembourg, is aimed at developing a better understanding of the impact of climate change on mountain gorillas in the Greater Virunga Landscape, Royal Bengal tigers in Bhutan and snow leopards in Central Asia, to improve protection of those species while supporting the local mountain communities who live alongside them. The programme has produced a series of climate vulnerability briefs for each of the three flagship species.

47. To increase the resilience of people and wildlife in Central Asia to climate change and such other related drivers as land-use change, habitat degradation and habitat shift, UNEP has initiated the project “Enhancing the conservation of flagship migratory mammal species of Central Asia through climate change-informed management and decision making”. Funded by the International Climate Initiative, the project has a geographical focus on Kazakhstan, Kyrgyzstan and Tajikistan and will run until 2025.

48. UNESCO launched the World Network of Mountain Biosphere Reserves in December 2021. In 2022, the Network identified priorities for mountain biosphere reserves and discussed future opportunities. The Research Centre for Eco-Environmental Studies of the Chinese Academy of Sciences and Los Valles de Omaña y Luna Biosphere Reserve in Spain jointly coordinate the Network’s technical secretariat.

49. In 2021, North Macedonia declared Shar Mountain its fourth national park, under the auspices of the project “Achieving biodiversity conservation through creation and effective management of protected areas and mainstreaming biodiversity into land use Planning”, initiated by UNEP and supported by GEF.

50. The publication entitled *Restoring Life to the Land: The Role of Sustainable Land Management in Ecosystem Restoration*, prepared by the secretariat of the United Nations Convention to Combat Desertification and World Overview of Conservation Approaches and Technologies and with input from FAO, includes a selection of good practices from the Global Database on Sustainable Land Management to inform policymakers and decision makers about on-site and off-site impacts of sustainable land management in mountains.²⁶

Mountain waste

51. In 2021, a mountain waste survey led by GRID-Arendal and supported by UNEP and the secretariat of the Basel, Rotterdam and Stockholm conventions, mountaineering federations and others, filled a knowledge gap on the types and quantity of waste found in remote mountain areas worldwide. The findings of the survey²⁷ showed that plastics are the most frequently observed type of waste, that

²⁶ William Critchley, Nicole Harari and Rima Mekdaschi-Studer, *Restoring Life to the Land: The Role of Sustainable Land Management in Ecosystem Restoration* (United Nations Convention to Combat Desertification and World Overview of Conservation Approaches and Technologies, 2021). Available at <https://www.unccd.int/resources/publications/restoring-life-land-role-sustainable-land-management-ecosystem-restoration>.

²⁷ Available at <https://news.grida.no/plastic-on-the-peak>.

organic waste can be a threat to human health if it contaminates water sources and that a source-to-sink approach is required to tackle the global pollution crisis.

C. Mountain economies and livelihoods

52. Mountain economies are often based on family farming and small-scale agriculture, tourism, mining and remittances. As mountains are often far from the most productive areas and have limited infrastructure, services and opportunities, people living in mountain areas tend to be poorer and more marginalized than those living in lowland areas. This is especially true for women, who often have little access to productive resources, assets, services, and economic and decision-making opportunities, owing to discriminatory social norms and practices.

COVID-19 implications, response and recovery

53. As a result of the ongoing COVID-19 pandemic and its socioeconomic impacts at multiple scales, risk and uncertainty appear to be affecting all people everywhere, including in mountains. The human health crisis is aggravating the unfolding and interconnected global emergencies associated with climate change, biodiversity loss and pollution.

54. Measures to reduce COVID-19 transmission have resulted in constraints to livelihoods and limited access to markets both to buy inputs and to commercialize mountain products. While many countries have pledged relief and recovery packages, they do not go far enough in promoting green, resilient and inclusive development focused specifically on mountain regions.

55. An initiative launched by the Central Himalayan Institute for Nature and Applied Research helped to address disruptions to food supplies in remote Himalayan villages in India. The COVID-19 relief programme implemented by the Institute, with support from the Wipro Foundation, provided food packages to more than 700 families living in 23 villages.

56. The International Centre for Integrated Mountain Development prepared a regional policy paper that assessed the impacts of the COVID-19 pandemic on life in the Hindu Kush Himalaya, including risks and vulnerabilities. It provided tools for developing evidence-based policies and more responsive institutional, policy and economic measures to facilitate country actions for an inclusive and resilient recovery and to help mountain communities become resilient to such future shocks as climate change and social and economic disruptions.

Migration and urbanization

57. Rural mountain communities share the challenges faced by many rural regions, including loss of population and skills. There are clear outmigration trends driven by both seasonal and permanent working opportunities in the lowlands. Support for governments in designing and implementing practical interventions can safeguard employment opportunities, particularly for young people, in rural areas.

58. In Central Asia, migration plays a key role in reshaping social, economic, and political landscapes. The Mountain Societies Research Institute of the University of Central Asia contributed to the Migration Governance and Agricultural and Rural Change (AGRUMIG) project “‘Leaving something behind’: Migration governance and agricultural and rural change in ‘home’ communities – Comparative experience from Europe, Asia and Africa”, which is supported by the European Union Horizon 2020 Framework Programme. The project indicates that migration is a livelihood

strategy for farmers, as remittances play a significant role in the development and sustenance of the livestock sector.

Social protection, gender and indigenous issues

59. Social protection is increasingly recognized as an effective tool in reducing poverty and vulnerability to shocks in developing countries.

60. Women contribute to resource management, biodiversity conservation, and water and food security in mountain regions. Women in rural mountain areas, who mostly work as subsistence farmers while also performing domestic work and communal activities, often face a poverty trap that undermines their well-being. Despite increased participation in the labour market, women remain invisible as active players and agents of change.

61. In 2021, the International Centre for Integrated Mountain Development and FAO organized three webinars on the theme “Women farmers and sustainable mechanization: Improving lives and livelihoods in the Hindu Kush Himalaya”. The webinars served to present experiences, technologies and interventions from Bhutan, Nepal and the private sector; raise awareness; advocate actions around current mechanization gaps; and identify good practices and possible solutions for empowering women farmers.

62. FAO, in collaboration with the Ministry of Tourism of Palau, Mountain Partnership Secretariat, Slow Food and Sustainable Travel International, implemented the Palau Sustainable Tourism Value Chain programme, an innovative tourism destination approach that includes developing a carbon management programme for tourists, conserving agricultural biodiversity, promoting sustainable local food production, and enhancing gender equality and the economic empowerment of women engaged in agrifood value chains.

Capacity development and training

63. At the regional and local levels, capacity development and training are crucial for building expertise and sharing knowledge about mountain regions in different areas worldwide.

64. Since 2008, the Mountain Partnership Secretariat has organized the annual International Programme on Research and Training on Sustainable Management of Mountain Areas, a two-week summer course that provides an opportunity to learn about and discuss the key challenges and opportunities for mountain sustainable development. In 2021, a course was also conducted in Spanish, with a focus on Latin America, in collaboration with the Consortium for the Sustainable Development of the Andean Ecoregion.

65. The GROW summer school “Agrobiodiversity in a changing climate”, organized by the Mountain Partnership Secretariat in collaboration with Sapienza Università di Roma, the Alliance of Bioversity International and the International Center for Tropical Agriculture, and the Platform for Agrobiodiversity Research, focuses on the importance of biodiversity in agriculture. It is aimed at giving participants the knowledge and tools necessary to improve the resilience and adaptability to climate change of cropping and farming systems, particularly in fragile ecosystems such as mountains, while enhancing productivity and marketing strategies.

66. An inclusive co-curricular student-engaged learning model developed at Utah Valley University in the United States of America involved students, especially non-traditional learners, in promoting sustainable mountain development in the State of Utah and at the United Nations.

Mountain agrifood systems

67. Sustainable agrifood systems are drivers of resilient and sustainable mountain development, owing to their potential for small and medium-sized enterprises and their links with tourism and niche markets. Sustainable mountain farming systems can drive progress in reducing rural poverty, ending hunger and ensuring the resilience of mountain communities while maintaining the provision of global ecosystem services, especially those related to water.

68. Mountain Partnership members participated in the 2021 United Nations Food Systems Summit to highlight the role of sustainable food systems in mountains and their contribution to more equitable and inclusive development. The Mountain Partnership Secretariat joined as a co-leader of the Land-Freshwater Nexus Cluster Coalition, together with the International Water Management Institute and The Nature Conservancy, to ensure that the role of mountains in the water cycle was recognized and incorporated in the work of the Food Systems Summit and follow-up thereto.

69. The 2021 FAO publication entitled *Mountain Farming Systems – Seeds for the Future* highlights experiences of agroecological mountain farming systems to focus increased attention on agroecological principles and approaches and showcase their potential for conserving agrobiodiversity and building resilience in mountains.²⁸

70. Developed by the Mountain Partnership Secretariat in collaboration with Slow Food, the Mountain Partnership Product initiative is helping to improve local mountain economies by strengthening value chains and promoting a labelling scheme for small-scale mountain producers. Through collaboration with the United Nations Development Programme GEF Small Grants Programme, Mountain Partnership Product producers in Guatemala, Lesotho, Nepal and Rwanda received training on agrobiodiversity mapping and participatory guarantee systems to certify their organic farming systems.

71. In 2017, the National Mountain Area Agency of Romania began granting the national “mountain product” label to agrifood products from Romanian mountain areas. By the end of April 2022, 3,375 mountain products, made by 1,247 producers, had been thus labelled.

72. In 2019, FAO launched the Mountain Agriculture Initiative in Asia and the Pacific and supported Bangladesh, Bhutan, India, the Lao People’s Democratic Republic, Myanmar, Nepal, Pakistan and Viet Nam to identify multidimensional challenges and turn them into opportunities to contribute to sustainable mountain agriculture development aimed at eliminating hunger and reducing poverty in Asia. It also identified and promoted the production, processing, marketing and consumption of specialty mountain products such as Future Smart Foods for food systems transformation and livelihood improvement. Strong partnerships have been built with 22 national and international institutions related to mountains and biodiversity.²⁹

²⁸ Rosalaura Romeo and others (eds.), *Mountain Farming Systems – Seeds for the Future. Sustainable Agricultural Practices for Resilient Mountain Livelihoods* (Rome, FAO, 2021).

²⁹ FAO, *Mountain Agriculture: Opportunities for Harnessing Zero Hunger in Asia* (Bangkok, 2019).

Sustainable mountain tourism

73. On the occasion of International Mountain Day 2021, FAO and the World Tourism Organization (UNWTO) launched the report *Mountain Tourism: Towards a More Sustainable Path*. The report provides highlights on how a sustainable approach to mountain tourism can promote local economies, while preserving cultural identities and maintaining a balanced use of resources. The COVID-19 crisis represents an opportunity for mountain destinations to rethink their products and services and to embrace low-carbon pathways, guided by the UNWTO Global Code of Ethics for Tourism and the Glasgow Declaration on Climate Action in Tourism, committing stakeholders to work towards net zero emissions by 2050.

74. The company Soudah Development aims to create a sustainable tourism destination in the Sarawat Mountains in the Aseer region of Saudi Arabia. Soudah Development will reintroduce local endemic species through a cultural landscape approach, plant 1 million trees by 2030, increase the extent of protected areas, rehabilitate and rewild selected areas, reintroduce flagship species and implement solutions to stop the spread of invasive species.

Mountain-related financing

75. Climate finance can substantially enhance the potential scale of investment in sustainable and resilient practices in mountain ecosystems. Innovative financial solutions are available to lower the risks and barriers to private sector investments in mountains in emerging and frontier markets. Such solutions can also bridge the gaps in public sector budgets and institutional capacity on mountain conservation and climate change adaptation goals.

76. The Green Climate Fund has approved 29 projects in mountainous areas of 26 countries, investing a total of \$ 1.7 billion.³⁰ Most Fund-approved projects in mountain ecosystems are designed to restore and rehabilitate natural resources that are key for productive systems, in particular agricultural systems, for food and water security and for improved market access.

77. In 2021, the International Centre for Integrated Mountain Development introduced the Mountains of Opportunity investment framework for the Hindu Kush Himalaya, enabling investment partners – including Governments, mountain communities, financial institutions, private sector actors and development partners – to identify, align and scale up investment in mountain-specific climate priorities in the near to medium term. The investment priorities identified, aligned with climate action and COVID-19 recovery, will contribute to climate-resilient, carbon-neutral mountain societies.

78. The Mountain Facility is a funding mechanism managed by the Mountain Partnership Secretariat to rapidly support Mountain Partnership members' requests and needs by providing grants. Phase I will focus on the promotion of climate-resilient business models that enhance mountain biodiversity.

D. Governance

79. Long-term vision and inclusive and integrated approaches, including the incorporation of mountain-specific policies into national sustainable development strategies, can increase efforts to achieve resilient and sustainable mountain development.

³⁰ The approved single-country projects can also include other ecosystems and landscapes.

80. The 2019 National Environment Act of Uganda repealed, replaced and reformed the law relating to environmental management in the country. The Act covers the management of the green environment and includes sections on hilly and mountain areas.

81. The Law on the Development of High Mountainous Regions is part of the regional development policy of Georgia. It is aimed at ensuring the equal socioeconomic development of the entire national territory, and at stimulating social and economic progress in high mountain areas as guaranteed by the Constitution, to ensure the well-being of people living in the high mountains, increase their standard of living, promote employment, and improve social and economic conditions. The Law was issued in 2015 and last updated in 2021.

82. The Government of Italy has approved a bill to improve health care, education and connectivity in mountain areas. It also aims to enhance mountain economies through incentives for agricultural and forestry entrepreneurs, and through favourable fiscal measures for mountain businesses run by young people and for those who purchase their first home in a mountain municipality.

83. In 2019, the Council of Ministers of Cyprus approved the first National Strategy for the Development of Mountainous Communities, in which a development model adapted to the particular conditions of the country's mountain region is proposed. The operational plan, which includes 350 actions to achieve six strategic interventions, has been adopted.

National mountain committees

84. In 2021, the National Mountain Committee of Argentina was officially ratified through its inclusion within the scope of work of the Ministry of Environment and Sustainability.

85. The Committee for the Sustainable Management of Mountains of Chile submitted a national policy for the sustainable management of mountains to the Council of Ministers for Sustainability in January 2021. The Committee has been working on improving the policy through the elaboration of an action plan and requesting an order from the Presidency to begin the process of developing a strategic environmental assessment.

86. According to the provisions of the Mountain Law of Romania, the country's mountain area comprises nine groups of mountains. For each group, a Massif Committee has been established to advise on the implementation of policies and strategies for the development and protection of the mountain environment. A National Mountain Council will liaise with the Government and mountain area representatives. The Government of Romania is also implementing a nationally-financed programme to develop mountain agricultural activities.

Partnerships, transboundary cooperation and conventions

87. Founded in 2002, the Mountain Partnership is the only United Nations voluntary alliance of partners dedicated to mountains and people living in mountain areas. By facilitating the exchange of experience, knowledge and expertise among its members, the Mountain Partnership addresses challenges facing mountain regions at the global level. As of May 2022, the Mountain Partnership had 454 members, including 60 Governments, 12 subnational authorities, 18 intergovernmental organizations and 364 major group organizations such as civil society, non-governmental organizations and the private sector. Its main role is to facilitate dialogue and advocacy on priority issues faced by peoples and environments in mountain areas.

88. At the Hindu Kush Himalaya Ministerial Mountain Summit in 2020, eight ministers from across the region signed a ministerial declaration endorsing the Hindu Kush Himalaya Call to Action,³¹ which commits the eight Governments of the region to action across six areas: cooperate at all levels regional cooperation at all levels for sustainable and mutual benefit; recognize and prioritize the uniqueness of the people living in the Hindu Kush Himalaya Mountains; take concerted climate action at all levels to keep global warming to 1.5°C by 2100; take accelerated actions to achieve the Sustainable Development Goals and nine mountain priorities; enhance ecosystem resilience by halting biodiversity loss and land degradation; and share regional data and information and engage in science and knowledge cooperation. After the Ministerial Summit, a special Hindu Kush Himalaya High-level Task Force was formed to facilitate the implementation of the Call to Action and to assess the potential for an institutional mechanism to strengthen regional cooperation in the Hindu Kush Himalaya region.

89. The Andean Mountain Initiative seeks to strengthen regional dialogue among Argentina, Bolivia (Plurinational State of), Chile, Colombia, Ecuador, Peru and Venezuela (Bolivarian Republic of) for the sustainable development of the Andean Mountains. The political secretariat is currently provided by the Government of Peru, and the technical secretariat is supported by the Consortium for the Sustainable Development of the Andean Ecoregion, together with the Mountain Partnership Secretariat and UNEP. Recent milestones include the launch of a community of practice, a communication strategy, and a new web portal³² in Aymara, English, Quechua and Spanish.

90. At the sixteenth Alpine Conference, the Contracting Parties to the Alpine Convention adopted the Climate Action Plan 2.0,³³ identifying 16 priority implementation pathways with concrete short- and medium-term steps towards the achievement of the Alpine Climate Target System 2050.³⁴ The Alpine Conference adopted a Declaration on integrated and sustainable water management in the Alps and a Declaration on the Protection of Mountain Biodiversity and its Promotion at International Level. A new working group on Spatial planning and sustainable development was established within the scope of the Alpine Convention. Transnational cooperation continued through all Convention bodies and through active involvement in the European Union Strategy for the Alpine Region.

91. The European Union Strategy for the Alpine Region is a macroregional strategy based on a joint initiative of Alpine States and regions to strengthen cooperation among them and to address more effectively such Alpine-specific challenges as the balancing of development and environmental protection, the enhancement of competitiveness and the reduction of territorial disparities.

92. At its sixth meeting, the Conference of the Parties to the Framework Convention on the Protection and Sustainable Development of the Carpathians (Carpathian Convention) adopted the International Action Plan on Conservation of Large Carnivores and Ensuring Ecological Connectivity in the Carpathians, and the Long-term Vision 2030 towards combating climate change in the Carpathians. The Parties also adopted the Road Map towards the accession of the European Union to the Carpathian Convention, with a view to strengthening cooperation with European Union institutions. The Protocol on Sustainable Agriculture and Rural Development

³¹ Available at <https://lib.icimod.org/record/34934>.

³² See www.iam-andes.org.

³³ Available at <https://alpineclimate2050.org/climateactionplan20/>.

³⁴ See Alpine Convention, "Climate-neutral and Climate-resilient Alps 2050". Available at <https://www.alpconv.org/en/home/news-publications/publications-multimedia/detail/climate-neutral-and-climate-resilient-alps-2050/>.

to the Carpathian Convention entered into force in 2021 for almost all Parties to the Convention. In addition, the Memorandum of Cooperation between the Convention on Biological Diversity and the Alpine Convention and the Carpathian Convention is being renewed in the light of the post-2020 global biodiversity framework.

IV. Recommendations for sustainable mountain development

93. Mountain-specific policies should be developed to address the main causes of vulnerability of the people and ecosystems in mountain areas. Urgent steps are needed to end marginalization, poverty, gender discrimination and inequality, and halt ecosystem degradation and the unsustainable use of natural resources in mountains.

94. The actions proposed below seek to address the gaps that have been identified.

95. To build resilience to climate change and disasters, it is recommended that Member States:

(a) **Promote and scale up adaptation options that offer practical prospects for reducing climate risks and build on diverse knowledge systems, including indigenous knowledge and local knowledge; implement adaptation and effective mitigation actions to limit warming to 1.5°C, while also addressing the root causes of vulnerability, which include poverty, marginalization and inequitable gender dynamics, to reduce climate risks; and strengthen transboundary cooperation to address climate risks and regional adaptation to climate change in mountains, and to reduce greenhouse gas emissions, in line with the findings of the Intergovernmental Panel on Climate Change Cross-Chapter Paper on Mountains;**

(b) **Strengthen institutions and mountain governance mechanisms for climate adaptation in mountains, and increase the capacity of local staff to promote sustainable landscape approaches;**

(c) **Incorporate risk-sensitive and climate-adapted land use planning in infrastructure development in mountain regions, including educational and health facilities, seismically and climatically adapted housing, and sustainably built infrastructure.**

96. To conserve and restore ecosystems for production and protection purposes and to protect and sustainably use biodiversity, it is recommended that Member States:

(a) **Promote mountain ecosystem restoration as part of the United Nations Decade on Ecosystem Restoration, working closely with FAO, UNEP, United Nations system organizations, regional organizations and partners in the United Nations Decade;**

(b) **Integrate multi-stakeholder engagement in watershed planning to promote the linkage of upstream and downstream issues and to combine land use, forestry and water management;**

(c) **Promote silvopastoralism in dryland mountain areas, integrating forestry and mobile livestock under an agroforestry approach to support efficient production;³⁵**

³⁵ FAO, *Pastoralism – Making variability work*, FAO Animal Production and Health Paper No. 185 (Rome, 2021).

(d) **Strengthen policies and infrastructure for environmentally sound waste management in mountains;**

(e) **Incorporate traditional knowledge, research and innovation, participatory planning and governance mechanisms and secured land rights for integrated territorial strategies in mountain areas.**

97. To improve livelihoods and promote COVID-19 recovery in mountain areas, it is recommended that Member States:

(a) **Promote sustainable agrifood systems and resilient livelihoods, especially for women and young people, by improving value chains of mountain products; enhancing institutional, technical, entrepreneurial and marketing capacities of producers; promoting participatory guarantee systems; and ensuring inclusive access to digitalization, including block chain technology, and to markets;**

(b) **Foster sustainable tourism in mountains through innovation and the development of year-round sustainable experiences, and by investing in the digitalization of services and empowering communities through capacity-building, access to financing and strengthened multilevel governance, while ensuring regular monitoring and assessment of the impact of tourism on mountains;**

(c) **Increase the labour market participation of women living in mountain areas and enhance their skills, knowledge and productivity, including through the adoption of inexpensive agricultural machinery adapted to local conditions, to reduce gender inequalities and enable a shift from subsistence to more market-oriented farming;**

(d) **Expand social protection coverage for local communities and indigenous peoples in mountain areas and strengthen coherence between social protection and programmes for reducing vulnerabilities, enhancing income generation, promoting sustainable forest management and safeguarding youth employment opportunities;**

(e) **Determine the contribution of mountains to the maintenance of relevant health determinants to offer insights into the complex health relationships between humans, animals, plants and the environment, for better health governance in mountain areas.**

98. To leverage international processes in support of mountain development, it is recommended that Member States:

(a) **Join forces to advocate sustainable mountain development at the United Nations and in other relevant global forums, to ensure that mountains are mainstreamed in plenary discussions to promote adaptation plans;**

(b) **Highlight and give priority to mountains in development agendas and processes, including in voluntary national reviews by the high-level political forum on sustainable development and in national adaptation plans and nationally determined contributions;**

(c) **Include the mountain perspective in the development and future implementation of the monitoring framework of the post-2020 global biodiversity framework, building on available indicator sets, and implement the Programme of Work on Mountain Biodiversity of the Conference of the Parties to the Convention on Biological Diversity to complement and strengthen the new global biodiversity framework, stressing also the importance of regional and transboundary collaboration as means of implementation;**

(d) Encourage countries to continue reporting on target 15.4 of the Sustainable Development Goals;

(e) Build on the multi-stakeholder membership of the Mountain Partnership and take advantage of the opportunities provided by the International Year of Sustainable Mountain Development in 2022, International Mountain Day and other relevant United Nations days and decades to mobilize more resources and promote investments and specific actions;

(f) Incorporate the outcomes of the 2021 United Nations Food Systems Summit for the development of sustainable food systems in mountains by protecting traditional and indigenous food systems, promoting resilient agrifood systems, addressing land rights and tenure issues, building capacity and recognizing the role of women as custodians of agro-biological knowledge.

99. To enhance research and data on mountain-specific issues, it is recommended that Member States:

(a) Increase the collection and dissemination of disaggregated data on mountain-related economic, social, environmental and meteorological issues for policy advice at the local, national and regional levels;

(b) Increase investments targeted at strengthening national and regional information systems and increasing technical capacities in mountain countries to produce better analyses;

(c) Support scientific and participatory processes to generate relevant local level data on climate and disaster risk, build up a database of localized historical climate and weather data and develop risk models and scenarios to inform broader land-use and development planning.

100. To promote sustainable investments, financial mechanisms and partnerships with the private sector, it is recommended that Member States:

(a) Encourage adaptation finance and the inclusion of private sector contributions for adaptation in mountains;

(b) Promote climate finance, such as that provided by GEF, the Green Climate Fund and other mechanisms, that enables countries to overcome the barriers to scaling up private investment in mountain ecosystems and landscapes, including a lack of accurate information on mountain value chain productivity and financial track records of the development and creditworthiness of micro-, small and medium-sized enterprises, low long-term returns, high perceived investment and reputational risks, and a limited enabling environment, especially in least developed countries.