



General Assembly

Distr.: General
22 July 2019

Original: English

Seventy-fourth session

Item 19 (l) of the provisional agenda*

Sustainable development

Sustainable mountain development

Report of the Secretary-General

Summary

Covering 27 per cent of the world'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 vulnerable to natural disasters, climate-related events and unsustainable resource use. Mountains are home to about 1.1 billion people who are among the world's poorest: half of rural mountain dwellers face food insecurity. Access to services and infrastructure is lower in the highlands than in other areas. Mountain communities are particularly vulnerable to the impacts of natural hazards because of their high dependence on agriculture (encompassing crops, livestock, fisheries, aquaculture and forestry) as their primary source of livelihood. Alone or in combination, these factors make living in mountain areas increasingly difficult and they are often adverse drivers that compel people to migrate. Identifying new and sustainable livelihood opportunities and adopting practices that build the resilience of people and environments in mountain areas is an urgent requirement for achieving the Sustainable Development Goals. The present report includes some recommendations on actions to accelerate progress towards sustainable mountain development.

* A/74/150.



A. Introduction

1. The present report of the Secretary-General is submitted pursuant to General Assembly resolution 71/234. The report was prepared by the Food and Agriculture Organization of the United Nations (FAO) and the Mountain Partnership Secretariat, in collaboration with governments, relevant agencies of the United Nations system and other organizations.

2. Mountain stakeholders have responded to the 2030 Agenda for Sustainable Development with initiatives at all levels, as described in the present report. Cooperation on mountain issues is on the rise, as is awareness of the vital contributions of mountains to life on the planet and to sustainable development. However, poverty, vulnerability and exclusion in mountain regions are the reality for millions of people and hinder development opportunities, especially for young people. The negative impacts of climate change and natural hazards are urgent concerns in mountain areas, heightening the pressing need to strengthen the resilience of the people and ecosystems in these areas. The present report highlights six interrelated areas on which multi-stakeholder action should focus to address the gaps, accelerate sustainable mountain development and contribute to the implementation of the 2030 Agenda.

B. Background and challenges

3. Mountains are key ecosystems, providing goods and services to the entire planet and supporting the livelihoods of a vast number of people. In particular, mountains cover 27 per cent of the world's land surface and, according to figures from 2017, are home to about 1.1 billion people, representing a little less than 15 per cent of the global population.¹ Mountains provide between 60 and 80 per cent of the earth's fresh water and host 25 per cent of terrestrial biodiversity.²

4. Mountain ecosystems are highly vulnerable to the increasing adverse impacts of climate change, extreme weather events, deforestation, land degradation and natural disasters, from which they recover slowly. The retreat and thinning of mountain glaciers around the world are affecting water cycles, with increasing effects on the environment and livelihoods in the uplands and the lowlands.

5. Throughout the centuries, mountain communities have created highly diversified socioeconomic systems to protect their livelihoods from the uncertainties of their harsh environments. Mountain agriculture is often highly biodiverse and inherently has a low impact on the environment, based on family farming and small-scale production. Mountain indigenous peoples and local communities possess a wealth of knowledge of species and traditional practices that could contribute to climate change adaptation and biodiversity conservation.

6. Poverty and food insecurity in mountain areas are generally more prevalent than in the lowlands, often leading to outmigration. 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. This number has risen sharply since 2012, when it was estimated that there were some 300 million

¹ Fabio Grita, *Key Drivers to the Vulnerability of Mountain Peoples to Food Insecurity. Preliminary Results* (forthcoming).

² 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>.

people in rural mountain areas in developing countries who were vulnerable to food insecurity – 53 per cent of the total rural mountain population.³ The vulnerability of people living in mountain areas stems from a combination of difficult environmental conditions and limited access to basic services such as transport, education, health care and markets.

C. Mountains and the 2030 Agenda for Sustainable Development

7. 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 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.

8. Numerous studies on the progress made in the implementation of the Sustainable Development Goals in the mountain context since 2016 have shown that there is a need for data disaggregation and that local context matters, given that the needs, priorities and interrelations among the Goals differ among regions. Pragmatic approaches for assessing progress on sustainable mountain development and investment for addressing data gaps are needed. Voluntary national review processes, as well as regional and global reviews, provide effective platforms for drawing attention to challenges in mountain areas and highlight the potential of mountain areas to contribute to sustainable development and to support sustainable development in neighbouring lowland areas.

9. To increase awareness and identify priority areas for mountain development actions, the Mountain Partnership, during its global meeting in December 2017, endorsed a framework for action on implementing the 2030 Agenda for mountains. Members pledged to review and update their development policies in order to include strategies for sustainable mountain development; to review and update their international development policies to include sustainable mountain development; and to raise awareness about the importance of sustainable mountain development in relevant forums. Currently, regional processes in Asia and Latin America are supporting Mountain Partnership member countries in mainstreaming mountain issues in their national agendas and identifying regional cooperation themes through workshops, a review of national laws, Sustainable Development Goal monitoring and support for the preparation of voluntary national reviews.

10. At a session dedicated to mountains, held on 15 May 2018, during the Expert Group Meeting on Goal 15 in New York, organized by the Department of Economic and Social Affairs, participants highlighted the need to promote cross-sectoral synergies, emphasize locally tailored solutions and ensure the inclusion of mountain communities in decision-making processes for Goal 15 in the context of the 2030 Agenda.

³ Fabio Grita, *Key Drivers to the Vulnerability of Mountain Peoples to Food Insecurity. Preliminary Results* (forthcoming).

11. A side event on the theme “Leading sustainable mountain development”, led by Andorra, at the high-level political forum on sustainable development in 2018 affirmed the importance of promoting dialogue between mountain communities and governments and building a coalition of key mountain governments within the Mountain Partnership.

12. 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 is monitored by the Mountain Partnership Secretariat. The Mountain Green Cover Index monitors how mountain ecosystems evolve and assesses their state of conservation and health. A global baseline was established in 2017. According to the baseline data, 76 per cent of the world’s mountain areas were covered by a form of green vegetation: 41 per cent by forests, 29 per cent by grassland or shrubland and 6 per cent by cropland.⁴ The next data collection is planned for 2020. Greater accuracy is still needed in assessment of the indicator at the national level to guide decision makers in their action towards the achievement of target 15.4. Since December 2017, all countries have been requested to validate their data and to improve their accuracy. The main challenges encountered in assessing and validating the Mountain Green Cover Index include lack of technical capacity at the country level and lack of communication between Sustainable Development Goal focal points and relevant ministries. Those issues are being addressed through capacity-building efforts.

Climate change

13. Features such as high altitude and slopes make mountain ecosystems especially susceptible to variations in weather and climate. Changes in climatic conditions translate to changes in snow, glaciers and permafrost, with consequences for water availability and ecosystems and leading to changes in habitats. High-emission pathways will lead to large-scale deglaciation. Even under low-emission scenarios, in which warming is limited to 1.5°C, about 50 per cent of current glacier ice may be lost in some regions.⁵ For instance, glaciers in high-mountain Asia are expected to lose 36 per cent of their volume by 2100 if temperatures rise by 1.5°C.⁶ Glacier loss will have a direct impact on the availability of water resources, initially leading to increased river flows, followed by reduced flows after 2060, resulting in droughts.

14. Earlier snowmelt, changing precipitation regimes, rain-on-snow events, permafrost thaw and accelerated glacier melt in mountains are increasing the risks of floods (including flash floods and glacial lake outburst floods), avalanches, landslides, rockfalls, slope failure, river damming from surging glaciers and other hazards and extreme events.

15. In many places, the cascading effects of these changes exacerbate existing vulnerabilities caused by poverty, inadequate infrastructure, environmental degradation, deficiencies in governance and limited resources. Mountain perspectives should be an integral part of discussions about sustainable development in the context of climate change. Those discussions should not only highlight the vulnerabilities

⁴ Mountain Partnership Secretariat, “SDG Indicator 15.4.2 – Mountain Green Cover”. Available at www.fao.org/sustainable-development-goals/indicators/15.4.2/en/.

⁵ Mountain Research Initiative, “Mountain glaciers: vanishing sources of water and life”. Available at www.mountainresearchinitiative.org/index.php/activities/communication-campaigns/vanishingglaciers.

⁶ Philippus Webster and others, eds., *The Hindu Kush Himalaya Assessment: Mountains, Climate Change, Sustainability and People* (Springer Nature Switzerland AG, Cham, Switzerland, 2019).

inherent to mountain regions, but also emphasize the resilience of the people and communities in those regions when dealing with such challenges.⁷

16. The impact of climate change in mountain areas, and on their ecosystems and communities, is being examined by the Intergovernmental Panel on Climate Change, as part of the sixth assessment cycle, in the chapter on high mountain areas in its *Special Report on the Ocean and Cryosphere in a Changing Climate*, due to be published in September 2019, and in a cross-chapter paper on mountains, to be prepared by Working Group II, due in 2021. The Mountain Research Initiative, an international research network funded by the Swiss Academy of Sciences and the Swiss Agency for Development and Cooperation, is leading the authors in this work.

17. In its landmark decision on the Koronivia joint work on agriculture (decision 4/CP.23),⁸ adopted at the twenty-third meeting of the Conference of the Parties to the United Nations Framework Convention on Climate Change in 2017, the Conference officially acknowledged the role of the agricultural sectors in tackling climate change. FAO is working closely with the secretariat of the Framework Convention to support countries in advancing the joint work and upscaling climate action in the agricultural sectors, through the organization and facilitation of informal workshops for negotiators; the provision of necessary background materials, analysis and other knowledge products relevant to the joint work; and the preparation of submissions to the secretariat of the Framework Convention on related topics.

18. The United Nations Environment Programme (UNEP) and partners have developed the Mountain Adaptation Outlook Series, a collection of reports highlighting the urgency of protecting mountain ecosystems and mitigating human risk from extreme events and examines the effectiveness of existing adaptation policies in a number of areas, including the Carpathian Mountains, Central Asia, eastern Africa, the western Balkans, the Hindu Kush Himalayas, the southern Caucasus and the tropical Andes. This exercise feeds into regional dialogue processes supported by the Government of Austria.

19. The United Nations Educational, Scientific and Cultural Organization (UNESCO) supports Member States by providing a knowledge basis to address the impact of climate change on mountain ecosystems through two essential projects: “The impact of glacier retreat in the Andes: international multidisciplinary network for adaptation strategies” and “Strengthening the resilience of Central Asian countries by enabling regional cooperation to assess high-altitude glacio-nival systems to develop integrated methods for sustainable development and adaptation to climate change”. The International Hydrological Programme of UNESCO has released key publications and policy recommendations that include the need for increased support for science-based policy decisions and the implementation of good water governance.⁹

20. The Vanishing Treasures programme of UNEP supports the adaptation to climate change of vulnerable mountain species such as the royal Bengal tiger in the Hindu Kush Himalayas (Bhutan), the snow leopard in Central Asia (Kyrgyzstan and Tajikistan) and the mountain gorilla in the Virunga region (Rwanda and Uganda, in cooperation with the Great Apes Survival Partnership). The programme is funded by

⁷ Ibid.

⁸ Report of the Conference of the Parties on its twenty-third session, held in Bonn from 6 to 18 November 2017. Addendum. Part two: Action taken by the Conference of the Parties at its twenty-third session (FCCC/CP/2017/11/Add.1).

⁹ Tina Schoolmeester and Koen Verbist, eds., *The Andean Glacier and Water Atlas: The Impact of Glacier Retreat on Water Resources* (UNESCO and GRID-Arendal, 2018); and Paul Egan and Martin Price, eds., *Mountain Ecosystem Services and Climate Change: A Global Overview of Potential Threats and Strategies for Adaptation* (UNESCO, 2017).

Luxembourg and aims to generate synergies between climate change adaptation and biodiversity conservation by improving the adaptive capacity of mountain ecosystems while maintaining related ecosystem services, protecting mountain species and promoting alternative livelihoods for local communities.

21. The project “Strengthening climate adaptation capacities in the South Caucasus”, started in 2018 and financed by the Swiss Agency for Development and Cooperation, is aimed at reducing the vulnerability of communities to climate-induced natural hazards through strengthened regional cooperation. Sustainable Caucasus is the main partner, together with Global Resource Information Database (GRID)-Geneva and academies of science and universities of the wider Caucasus region. UNEP, in cooperation with GRID-Arendal, will produce a second edition in the Mountain Adaptation Outlook Series on the Caucasus.

Landscape approach in mountains

22. An integrated approach, in which the landscape is managed for a range of different land-use objectives, is vital to sustain the ecosystem services that mountains provide, allowing for the sustainable development of upland areas and the improvement of community livelihoods. Such an approach requires multi-stakeholder participation and embraces traditional and indigenous knowledge, as well as innovation. As mountain landscapes are often transboundary, the integrated landscape approach frequently entails collaboration beyond national borders.

Watershed management

23. Resilient watershed management is an integrated approach, encompassing people, their livelihoods and their interactions with their environment. In mountain areas, resilient watershed management includes activities to reduce disaster risk and to build resilient communities, while ensuring the provision of services upstream and downstream. This approach, which seeks to strengthen the dialogue and interaction between communities and governments, helps to address issues related to water scarcity, climate change, loss of biodiversity and food security and resolve conflicts over resource use in a coordinated and effective manner, thus helping countries to achieve their targets under Sustainable Development Goals 2, 6, 13 and 15.

24. FAO provides technical expertise in resilient watershed management to governments and communities. It develops innovative tools that allow expert and non-expert stakeholders to implement the risk-based and landscape approaches, including forest-water interactions, into their decision-making processes and management plans. Recently developed tools include a handbook and e-learning course on resilient watersheds, and a monitoring tool and facilitation guide on the forest-water nexus.

25. Since 2015, Morocco, Switzerland and FAO have been involved in a cooperation project on participatory and integrated watershed management, through which integrated land management approaches have been applied in a mountainous region of central Morocco and effective institutional collaboration has been built. At the provincial level, an agreement on joint management plans and on determining responsibilities for the implementation of activities was established through the project. At the community level, local cooperatives have been linked to services and suppliers and to other agents that can support their income generation activities. Risk management has also been successfully mainstreamed into integrated watershed management, at all stages, including the selection of sites, integrated watershed planning and project implementation. Work under the project is now focusing on improved monitoring of the effectiveness of risk reduction measures.

Sustainable forest management and land restoration

26. Under the umbrella of the National Afforestation and Reforestation Programme of the Government of Lebanon, FAO is implementing the five-year (2016–2021) project “Smart adaptation of forest landscapes in mountain areas”, in close collaboration with the Ministry of Agriculture. The aim of the project is to help to make mountain forests in Lebanon more resilient to climate change by planting native forest species in an area extending some 1,000 ha and developing and implementing sustainable forest management plans. A main focus is reducing the vulnerability of both the forests and the local communities to forest fires, insect pests and diseases through sustainable management practices. Community-based projects and capacity-building will improve the resilience of local communities to climate change.

27. The Forest and Landscape Restoration Mechanism is an international initiative implemented by FAO in seven countries. The Mechanism aims to significantly contribute to scaling-up, monitoring and reporting on forest and landscape restoration activities to the level needed to meet the Bonn Challenge and the Aichi Biodiversity Targets, in particular Target 15. Between 2016 and 2018, for example, the project supported innovative restoration mechanisms in Lebanon to counter degradation in mountainous areas and to enhance local livelihoods. The project targeted the rehabilitation of abandoned agricultural terraces in pilot areas and promoted environmentally friendly agricultural practices based on the principles of agroecology.

28. Sustainable land management is crucial to securing the natural resources base and the livelihoods of people in mountainous areas in order to achieve a land degradation-neutral world in the context of sustainable development. In Kyrgyzstan, the Institute of Sustainable Development Strategy is supporting local communities to revive the traditional practices of pasture management in order to restore degraded land. The Institute introduced community-based conservation strategies to reinforce conservation initiatives based on traditional ecological knowledge. This resulted in a revival of traditional customs of nomadic migration to remote pastures and the conservation of pastures. Collaborative strategies of pasture conservation using traditional knowledge have the long-term effect of improving the well-being of pasture users, while preserving and improving the condition of land resources.

Biodiversity conservation

29. Half of the world’s biodiversity hotspots are in mountains. Of the 20 plant species that supply 80 per cent of the world’s food, 6 (maize, potatoes, barley, sorghum, tomatoes and apples) originated in mountains. Because of the biogeographic isolation in which mountain biomes have evolved, they also harbour high numbers of endemic species, adding to the uniqueness of mountain biodiversity.¹⁰

30. The Global Mountain Biodiversity Assessment maintains a Mountain Portal,¹¹ which features a biodiversity inventory for more than 1,000 mountain ranges worldwide. The entity also implements an initiative that evaluates biodiversity-related opportunities for sustainable development at the global scale as well as at the local and national scales in the Plurinational State of Bolivia, Nepal and the United Republic of Tanzania.

¹⁰ FAO, *The State of the World’s Biodiversity for Food and Agriculture* (FAO Commission on Genetic Resources for Food and Agriculture Assessments, Rome, 2019).

¹¹ See www.mountainbiodiversity.org.

Disaster risk reduction

31. As a result of climate change and other global changes, disasters in mountains have become more frequent. Global fatal landslides have increased, predominantly in Asian countries, with substantial numbers of landslides along the Himalayan Arc and in China, Indonesia and the Philippines. A growing number of those landslides are triggered by human activity and exacerbated by unsustainable practices, such as poorly planned and implemented construction, illegal mining and illegal hill cutting.¹² Whether related to climate change or induced by human activities, increasing hazards affect the environment and disrupt the economy of mountain populations and of the millions of people who rely on the water, wood and other services provided by the mountains. As stated in the Sendai Framework for Disaster Risk Reduction 2015–2030, “it is urgent and critical to anticipate, plan for and reduce disaster risk in order to more effectively protect persons, communities and countries, their livelihoods, health, cultural heritage, socioeconomic assets and ecosystems, and thus strengthen their resilience”.

32. Published by the Permanent Secretariat of the Alpine Convention in 2019, the seventh report on the state of the Alps, on natural hazard risk governance, highlights the need to adopt stakeholder-based risk management systems involving all affected people, sharing responsibilities and spanning different administrative levels and sectors.

Mountain economies and livelihoods*Family farming*

33. Mountain communities are among the poorest in the world, often marginalized and left behind as development planning and service provision tend to focus on lowland areas. In mountains, family farming is prevalent and plays a key role in ensuring household food security, as well as shaping mountain landscapes and conserving natural resources and agrobiodiversity. Mountain family farming communities, and in particular indigenous peoples, are custodians of spiritual and cultural heritage and values and site-specific knowledge. The United Nations Decade of Family Farming (2019–2028) provides an opportunity to promote national policies that support secure land tenure, provide access to resources, empower women and vulnerable groups and retain youth in mountain regions.

34. The Forest and Farm Facility provides support to forest and farm producer organizations (smallholders, rural women’s groups, local communities and indigenous peoples’ institutions) to increase their technical and business capacities to respond to climate change and improve food security. The Facility also engages with governments to develop cross-sectoral mechanisms and policy processes that make use of rural people’s input. The Facility is a partnership between FAO, the International Institute for Environment and Development, the International Union for Conservation of Nature and AgriCord. Participating mountain countries include the Plurinational State of Bolivia, the Gambia, Guatemala, Liberia, Kenya, Myanmar, Nepal, Nicaragua, Viet Nam and Zambia.

Sustainable food systems in mountain agriculture

35. Sustainable production practices and the conservation of agrobiodiversity in mountain areas ensure dietary diversity and quality, generate income for smallholder farmers and aid ecosystem conservation and restoration (Sustainable Development Goals 1, 2, 3, 8, 12, 13 and 15). Mountain farmers are preserving many of the rarest

¹² Melanie Froude and Dave Petley, “Global fatal landslide occurrence from 2004 to 2016”, *Natural Hazards and Earth System Sciences*, vol. 18, issue 8 (August 2018).

varieties of crops in functioning biodiverse agroecosystems, yet the harshness of the environment and the effects of climate change are increasingly pressuring them to modify their traditional approaches to agriculture.

36. Agroecology, the approach that applies ecology to the agricultural production system offers a methodology aimed at meeting the needs of future generations while ensuring that no one is left behind. Its aim is to transform food and agriculture systems, to address the root causes of problems and to provide holistic and long-term solutions based on the co-creation of knowledge, sharing and innovation, including the combination of local, traditional, indigenous and practical knowledge with multidisciplinary science.¹³ Family farmers, including smallholder farmers, indigenous people, mountain farmers and pastoralists, are at the heart of agroecology. An example of an agroecological farming system in a mountain setting can be found in Yunnan Province, China, where the Hani people have been growing rice on terraces on steep mountainsides without water reservoirs for over 1,300 years. In the Páramo ecosystem in Colombia, an agroecology project led by the Faculty of Agrarian Sciences of the National University of Colombia worked with a network of farmers, universities, restaurants and gastronomy schools to manage the ecological production and value-chain improvement of native varieties of potato.

37. The Mountain Partnership Product initiative is helping to improve local mountain economies by strengthening value chains and introducing a labelling scheme for small-scale mountain producers. Developed in collaboration with the organization Slow Food, the initiative promotes sustainable food systems, agrobiodiversity conservation and innovation in mountain areas, adding value to traditional farming systems. Some 10,000 farmers in seven countries, of whom 6,000 are women, have so far benefited from the initiative. The initiative, through which 17 products are promoted, has in some cases led to a 25 per cent increase in the selling price and a rise of 40 per cent in the production of mountain products.¹⁴ The next phase involves an alliance with the United Nations Development Programme to expand the programme to four additional countries, with support from its Global Environment Facility Small Grants Programme. The Mountain Partnership Secretariat, in collaboration with Slow Food and the Department of Tourism of the Philippines, is also implementing a pilot project to promote sustainable food systems as drivers for sustainable tourism in mountain regions.

38. To promote organic agriculture in mountains, the Mountain Partnership is creating a global mountain participatory guarantee system and has established the first international participatory guarantee system network, in collaboration with the International Federation of Organic Agriculture Movements (IFOAM – Organics International). Participants in the Mountain Partnership Product initiative have committed to adopt a participatory guarantee system specifically designed to promote sustainable farming practices in the mountains of the world, by establishing a set of guidelines and standards for mountain organic farming systems, paired with fair trade criteria.

Migration and urbanization

39. Although migration patterns are context specific, the rural-to-urban migration of young people remains a significant trend in mountain areas. As most migrants are adult men, this trend has implications for the livelihoods of older persons and women, who are often left behind to manage the farms. Drivers of rural-to-urban migration

¹³ FAO, *FAO's work on agroecology: a pathway to achieving the SDGs* (Rome, 2018).

¹⁴ Mountain Partnership, "Mountain Partnership Product Initiative". Available at www.fao.org/mountain-partnership/our-work/regionalcooperation/climate-change-and-mountain-forests/mountain-partnership-products-initiative/en/.

include socioeconomic marginalization, high vulnerability to food insecurity, the increasing impacts of climate change and natural hazards and widespread environmental degradation.¹⁵ Half of the 20 countries with the highest share of remittances in GDP in 2017 were more than 50 per cent mountainous. In Kyrgyzstan, Tajikistan and Nepal, for example, remittances account for 33 per cent, 31 per cent and 28 per cent of GDP, respectively. In the light of the impact that migration, both internal and international, can have on mountain societies, it should be taken into account when developing policies.

Social protection and rural employment

40. Mountain communities often lack access to basic services, including social protection, because of their harsh and remote locations and distance from urban centres. There are efforts to overcome these barriers. An example includes the efforts by the Government of Mongolia to extend social protection coverage to rural populations with the support of the International Labour Organization.¹⁶ FAO is working on identifying and addressing the barriers to providing access to social protection in rural areas, including mountain regions, from a global perspective. Mountain areas also suffer from the loss of population and skilled talents, but their geographical characteristics add a further dimension of isolation that can inhibit economic activity and employment opportunities. FAO plays an important role in addressing these concerns through its activities on decent rural employment and supports governments in designing and implementing practical interventions that can safeguard employment opportunities, particularly for youth, in rural areas.

Gender equality

41. Women have a key role in environmental protection and social and economic development in mountain areas. They often bear the primary responsibility for natural resource management and agricultural production and for the well-being and survival of mountain families. However, discriminatory social norms and practices hinder the capacity of women to contribute to the development of mountain economies by limiting their access to productive resources, assets, services and economic and decision-making opportunities. Women also carry out a vastly disproportionate share of unpaid care work.

42. The Utah International Mountain Forum helped to raise global awareness of issues affecting mountain women at the sixty-second session of the Commission on the Status of Women, held at United Nations Headquarters in March 2018. Also at that session, the Russian Academy of Natural Sciences, the Mountain Institute and Utah China Friendship Improvement Sharing Hands Development and Commerce, all Mountain Partnership members, submitted a joint statement.

Indigenous peoples and local communities

43. The livelihood strategies, food systems and cultural identities of mountain communities and indigenous peoples are closely linked to their mountain environments. The perpetuation of traditional knowledge, including knowledge related to sustainable food systems, food practices and land management, is vital to people in mountain areas and is the basis for evolved and locally adapted livelihood strategies, such as the Waru Waru cultivation system in the Andes, which helps to

¹⁵ Felicitas Bachmann and others, eds., *Migration and Sustainable Mountain Development: Turning Challenges into Opportunities* (Bern, Switzerland, 2019).

¹⁶ International Labour Organization (ILO), "Mongolia: Report to the government. Extending old-age pension coverage to herders, the self-employed, informal sector workers and other non-covered working groups" (Geneva, Switzerland, 2013).

protect crops from frost, or shifting cultivation and transhumant pastoralism. Indigenous peoples are the custodians of the mountains in which they live, but they are also the first to be affected by climate change and other global changes, unsustainable development and other destructive processes transforming mountains and watersheds around the globe.

44. In the context of the 2030 Agenda and the United Nations Decade of Action on Nutrition (2016–2025), FAO led a study with Bioversity International and other international and local organizations to profile indigenous food systems across the world, including three in mountain areas of India and Kyrgyzstan. These profiles were presented during the High-Level Expert Seminar on Indigenous Food Systems held in November 2018 at FAO headquarters. The session on mountain food systems, facilitated by the Mountain Partnership, emphasized the need to incorporate traditional knowledge into the State-provided education system; to strengthen community organization in mountain regions; to develop a specific marketing strategy for mountain products; and to conserve mountain forests, which are the foundation for mountain food systems.

45. In 2018, the Mountain Partnership Secretariat launched a map of indigenous peoples and local communities living in mountain areas,¹⁷ providing a visual link to the mountain chains that they inhabit and presenting additional information about their cultures and food systems. Connected to a database, the map serves as a live repository of shared knowledge and best practices for indigenous communities living in mountain areas around the world. The two most important sources of information for developing this tool have been the Mountain Portal, prepared by the Global Mountain Biodiversity Assessment and Map of Life, which provides the polygons defining the world's mountain chains, and LandMark,¹⁸ which offers a large volume of reliable information on the location of indigenous territories.

Education and research

46. Since 2008, over 350 mid-level government officials and employees of non-governmental organizations from all over the world have been trained through the International Programme on Research and Training on Sustainable Management of Mountain Areas, organized by the Mountain Partnership Secretariat. In 2017 the course was focused on environmental and economic issues to enhance mountain sustainability, while in 2018 it was focused on the bioeconomy of the world's mountains. The course in 2019 will be dedicated to the landscape approach for enhancing mountain resilience. Main partners are the town of Ormea, the University of Turin and the University of Tuscia, all in Italy.

47. In 2018, Sapienza University of Rome, Bioversity International and the Mountain Partnership Secretariat launched an annual short course on agrobiodiversity in a changing climate. The course in 2018 was focused on sustainable production, fragile ecosystems and resilience to global changes. The course, which is delivered at the university level, is focused on the importance of biodiversity in agriculture, in particular in mountain areas.

48. The Scientific Network for the Caucasus Mountain Region, established by UNEP in collaboration with the University of Geneva, organized the first Caucasus Mountain Forum in Tbilisi in 2016 and is organizing a second Forum from 30 October to 2 November 2019. UNEP is partnering with major research organizations in the "Ecopotential" project, which promotes the use of earth observation for ecosystem

¹⁷ Mountain Partnership, "Indigenous peoples and local communities living in mountain areas map" (2019). Available at <http://hqfao.maps.arcgis.com/apps/webappviewer/index.html?id=561ae08b8526458ab9711ca5011dadbd>.

¹⁸ See www.landmarkmap.org.

management in European mountain protected areas such as Gran Paradiso National Park (Italy), Kalkalpen National Park (Austria) and Sierra Nevada (Spain). The project is funded under Horizon 2020, the largest research and innovation programme of the European Union, and is led by the National Research Council of Italy.

49. The Andes face enormous challenges from human pressure (85 million people) and from climate change and global environmental change, such as the retreat and disappearance of tropical glaciers.¹⁹ ANDEX, a hydroclimate research programme for the Andes was recently developed under the umbrella of Global Energy and Water Exchanges project, aims at understanding, modelling and predicting the dynamics of water and energy cycles of the Andes cordillera across the Bolivarian Republic of Venezuela, Colombia, Ecuador, Peru, the Plurinational State of Bolivia, Chile and Argentina.

Mountain tourism

50. Tourism may create wealth in mountain territories, yet its sustainability depends on the preservation of natural resources and the engagement of local communities. Tourism entrepreneurs need to understand the fragility of mountain ecosystems and must commit to preserving the unspoiled landscapes and healthy environments that make them attractive to tourists.

51. The World Tourism Organization of the United Nations held the third Euro-Asian Mountain Resorts Conference, on the theme “Innovative strategies for sustainable mountain tourism development”, in Tbilisi in April 2017, and the fourth Euro-Asian Mountain Tourism Conference, on the theme “The future of mountain tourism”, in Berchtesgaden, Germany, in March 2019. In 2017 the Conference focused on the potential of mountain tourism to foster economic development and to raise awareness on environmental protection. In 2019 participants at the conference discussed sustainability, digitalization and mobility, the diversification of mountain destinations in segments such as culture, health and sports, and the pressing need for investment in sustainable infrastructure and innovation in products and marketing.

52. The International Climbing and Mountaineering Federation, with a community of over 3 million climbers and mountaineers worldwide, raised awareness regarding sustainability in mountain leisure sports and activities through flagship projects such as the Respect the Mountains movement and the Mountain Protection Award. In 2017, the Mountain Protection Commission of the Federation signed a memorandum of understanding with the Environmental Commission of the International Federation of Mountain Guides Associations to conduct training and education activities and to develop environmental sustainability guidelines for member associations and the mountaineering community. The guidelines projects, carried out in collaboration with the Mountain Research Initiative and UNEP, are aimed at addressing Sustainable Development Goal 12, ensure sustainable consumption and production patterns.

53. Through the “Emeritus” project on eco-management for agritourism in mountain areas, the University of Turin, Italy, is creating an eco-management tool to boost the territorial development of marginal mountain valleys. The tool is based on environmental management systems and aims to integrate agriculture and tourism supply chains. Carried out in a north-western valley of the Italian Alps, the project aims to encourage social innovation and involves local administrations and private sector partners.

¹⁹ Germán Poveda and René Garreaud, “ANDEX: a hydroclimate research program for the Andes and a prospective GEWEX regional hydroclimate project” (2018).

Waste management

54. With the increasing number of tourists visiting popular mountain regions, expanding urban sprawl, increasing consumption patterns, existing and past mining operations and illegal dumping practices, many mountain regions are experiencing a growing solid-waste problem. After 60 years of expeditions to Mount Everest, it is estimated that up to 140,000 kg of solid waste remain in the area.²⁰ Steepness, remoteness, the prevailing socioeconomic conditions and vulnerability to natural hazards make waste management in mountain areas more challenging than in lowland areas. The inadequate treatment or disposal of waste in mountain regions creates risks for ecosystems and human health not only there, but also in the downstream areas. In the publication *Waste Management Outlook for Mountain Regions: Sources and Solutions*,²¹ both the challenges and the solutions for sound waste management in mountain regions are highlighted.

Governance

55. Effective, accountable and inclusive institutions are required for the development of strategic plans, the creation of fair policies and laws and the implementation of sustainable mountain development projects. The Mountain Partnership Secretariat supports countries and members in developing policy and regulatory frameworks, mainstreaming mountains in national laws and promoting national mountain committees.

Policy and law

56. In order to foster sustainable rural and mountain development, the Government of Switzerland established its first policy on rural areas and mountain regions in 2015. The policy, which is now being implemented, is aimed at increasing the coordination of the various sectoral public policies affecting rural and mountain areas – including agricultural, environmental and regional policies – towards a common vision.

57. Following 15 years of efforts, the Romania adopted the Mountain Law for a better future in mountain areas during the eleventh European Mountain Convention in 2018. The Mountain Law regulates models of sustainable and inclusive mountain development by valuing natural and human resources, increasing living standards, stabilizing the population, maintaining cultural identity, increasing local and national economic power and protecting the environment.

National mountain committees

58. National committees in many countries are the only national mechanism for promoting sustainable mountain development. The multidisciplinary composition of these committees allows for the implementation of an integrated approach to sustainable mountain development, facilitating the identification of priorities, the tailoring of solutions to local needs and the involvement of local communities in decision-making processes. During the International Year of Mountains in 2002, 78 national committees were set up around the world to lead the observance of the Year and to promote action. Many of these committees – for example, in Argentina, Chile and Romania – have evolved into more permanent bodies.

59. The Committee for the Sustainable Development of Mountainous Regions in Argentina acts as an institutional mechanism for dialogue and multilevel coordination

²⁰ See www.unenvironment.org/pt-br/node/20689.

²¹ Björn Alfthan and others, *Waste Management Outlook for Mountain Regions: Sources and Solutions* (UNEP, Nairobi; GRID-Arendal, Norway; and International Solid Waste Association, Vienna, 2016).

for the sustainable management of mountain ecosystems. The Committee aims to contribute to the institutional strengthening of actors involved in mountain development through the dissemination of information and the creation of networks. In particular, it has conducted training for experts in the north-western provinces of Jujuy, La Rioja and Catamarca in using mapping software and satellite images for mountain research and biodiversity conservation.

60. In 2016, Chile launched a public consultation to involve citizens in shaping the Government's priorities as it developed a national public policy on sustainable mountain development, an issue of key importance to this nation and its people. The consultation was one of the most participatory public policy formulation processes ever carried out, eliciting more than 3,000 comments. With this information, the 15 government institutions that constitute the National Mountain Committee (set up in 2007 and formalized in 2014) have drawn up a national policy on mountains, soon to be approved by the Council of Ministers for Sustainability.

61. Italy has fully integrated a priority on mountains in its development cooperation policies, from a perspective of global justice, development, human rights and security. Italy recognizes the extreme fragility of mountains as a neglected but primary threat to planetary balance, given their relevance as providers of ecosystem, economic and cultural services not only to mountain communities but also to highly populated lowlands. Italy has engaged in extensive advocacy and support action, based on the proven effectiveness of policies intended to grant mountain peoples their right to continue dwelling in their homelands. Italy is supporting the Mountain Partnership Product initiative to foster income generation through local production.

Partnerships, transboundary cooperation and conventions

62. The Mountain Partnership is the only United Nations voluntary alliance of partners dedicated to improving the lives of people living in mountain areas and protecting mountain environments around the world. Founded in 2002, the Mountain Partnership addresses the challenges facing mountain regions by tapping the wealth and diversity of resources, knowledge, information and expertise of its members. As at April 2019, the Mountain Partnership had 363 members, including governments, intergovernmental organizations and civil society, working towards a world in which sustainable mountain development receives greater public sector and private sector attention, commitment, engagement and investment.

63. The Coalition for Fragile Ecosystems, a new global alliance between the Mountain Partnership and the Global Island Partnership to ensure the protection of these fragile ecosystems and promote sustainable development for their vulnerable communities, was launched in 2017 at the fifth global meeting of the Mountain Partnership. In its strategy paper for 2018–2020, the Coalition is defined as a mechanism to speed up progress towards the achievement of the 2030 Agenda by adopting a common approach to attracting global attention towards fragile ecosystems supported by tangible commitments.

64. At its fifth meeting, the Conference of the Parties to the Framework Convention on the Protection and Sustainable Development of the Carpathians, held in October 2017, adopted a new article on climate change to bring recognition to climate change matters and establish a clear mandate for undertaking needed adaptation and mitigation actions in the Carpathian region. The parties also adopted the Protocol on Sustainable Agriculture and Rural Development. The Protocol on Sustainable Transport entered into force in 2019.

65. On the basis of the identified priorities for climate change adaptation, highlighted in the Mountain Adaptation Outlook Series and the strategic agendas on climate change adaptation, UNEP and its partners continue to support policy

processes within relevant frameworks and foster interregional exchanges of knowledge and best practices, including “mountain solutions”. To keep the momentum and to obtain relevant regional and country support, it is crucial to anchor these efforts within relevant institutional frameworks such as the East African Community, the High Andean Wetlands Regional Initiative or the Interstate Commission on Sustainable Development.

66. At the fifteenth Alpine Conference, held in Innsbruck, Austria, in April 2019, the parties to the Alpine Convention adopted the Alpine Climate Target System 2050, identifying targets in 12 sectors towards the overall objective of achieving climate-neutral and climate-resilient Alps by 2050. The Target System is aimed at the implementation of concrete measures that build on regional specificities, including the rich natural and cultural heritage of the Alps. It integrates mitigation and adaptation, transnational cooperation and potential co-benefits.

67. Since 2010, the Pyrenean Climate Change Observatory of the Working Community of the Pyrenees has worked to analyse the vulnerability to climate change of different populations, as well as natural, economic and social sectors throughout the Pyrenean cross-border region, through the development of appropriate methodologies and a collaborative perspective. The Working Community of the Pyrenees produced a report in 2018 containing updated information on the repercussions of climate change in the region; it provides evidence to shape policy regarding ways to adapt to climate change most efficiently, take advantage of emerging opportunities and maximize positive synergies with other sectoral policies.²²

68. The seven Andean countries – the Bolivarian Republic of Venezuela, Colombia, Ecuador, Peru, the Plurinational State of Bolivia, Chile and Argentina – within the framework of and with the support of the Mountain Partnership, have established the Andean Initiative, jointly with UNEP and the Swiss Agency for Development and Cooperation. The Andean Initiative is a regional platform that promotes sustainable mountain development through collaborative work, advocacy action and dialogue and exchange of information between scientists and policymakers on the priorities in the region. The Andean Initiative has been working under the leadership of the Ministry of Foreign Affairs of Chile as the regional coordinator and the Consortium for the Sustainable Development of the Andean Ecoregion in the role of the technical secretariat. The Andean Initiative has evolved into a fully fledged mechanism for transboundary cooperation, allowing strategies and policies to be implemented at the national, regional and international levels.

69. In April 2019, the Government of Canada announced 18.3 million Canadian dollars (about US\$13.6 million) of funding over five years for an ambitious research, training and knowledge-sharing mobilization agenda in support of the sustainability and prosperity of the mountainous regions of Canada. The Canadian Mountain Network, hosted by the University of Alberta, is funding 14 initial research projects across Canada under themes such as cultural landscapes; ecosystems; hazards; indigenous governance and land management; and livelihoods. The network emphasizes indigenous leadership in research, governance and management and is committed to combining indigenous and non-indigenous traditional knowledge systems to address the challenges in mountain regions.

²² Pyrenean Climate Change Observatory, *Climate Change in the Pyrenees: Impacts, Vulnerability and Adaptation* (2018). Available at www.opcc-ctp.org/sites/default/files/editor/opcc-informe-en-paginas.pdf.

D. Recommendations for sustainable mountain development

70. People living in mountain areas are among the most vulnerable people in the world, and the 2030 Agenda pledge to leave no one behind requires that particular attention be given to their needs in local, national and regional development interventions.

71. As highlighted in the present report, action is being taken in mountain countries to accelerate the implementation of the 2030 Agenda, and regional and global cooperation is well established and growing. It is also clear that urgent action is needed to reduce poverty, vulnerability and exclusion in mountain areas and to strengthen the resilience of the people and ecosystems in those areas in the face of climate change and natural resource degradation.

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

Building resilience to climate change and disasters and protecting biodiversity

73. In order to build resilience to climate change and disasters and to protect biodiversity, it is recommended that Member States:

(a) Develop and implement measures to strengthen the adaptive capacity and climate resilience of mountain communities and to reduce exposure to climate risks through increased generation and use of climate and disaster risk information, development of hazard risk maps and platforms, improvement of early warning systems and application of the risk-based approach in all development planning;

(b) Develop climate change impact and vulnerability assessments for crops, livestock, fisheries, aquaculture and forestry, as well as for those who depend on these sectors for their livelihoods;

(c) Promote ecosystem-based adaptation, in alignment with the guidelines adopted by the fourteenth meeting of the Conference of the Parties to the Convention on Biological Diversity in 2018, and climate-smart wildlife conservation as effective tools for reducing impacts on communities and species;

(d) Increase investment and robust local, regional and transboundary coordination for concerted action to keep global warming to 1.5°C by 2100;

(e) Strengthen institutions in advancing climate adaptation by building the capacity of local staff to promote landscape approaches and climate-smart agriculture.

Livelihood improvement in mountain areas

74. In order to improve livelihoods in mountain areas, it is recommended that Member States:

(a) Promote diversified livelihood options by improving and shortening value chains for mountain products; promoting ecotourism; enhancing the institutional, technical, entrepreneurial and marketing capacities of producers and institutions; increasing access to markets; and supporting ecosystem-based services schemes for mountain farmers;

(b) Strengthen and build on the experiences and innovations spearheaded by the Mountain Partnership Product initiative;

(c) Engage local communities, draw upon traditional knowledge and promote opportunities for women and indigenous populations;

(d) Strengthen mountain family farming by empowering women and ensuring gender equality, promoting specific policies for mountain family farming, securing

land tenure, providing access to resources for mountain family farms and improving basic infrastructure in mountain regions;

(e) Ensure that mountain tourism development is compatible with the preservation of mountain ecosystems and involve communities in planning mountain tourism policies in order to ensure the long-term sustainability of tourism and its alignment with the Sustainable Development Goals.

International processes

75. In order to leverage international processes in support of mountain development, it is recommended that Member States:

(a) Prioritize mountain issues within development agendas and processes through implementation of commitments under the Mountain Partnership framework for action on implementing the 2030 Agenda for mountains, including reference to mountains in their voluntary national reviews;

(b) Support the mainstreaming of mountain-related issues in the processes of United Nations conventions and other relevant global forums, such as debate on the post-2020 global biodiversity framework and the “new deal for nature”.

Financial mechanisms and partnerships with the private sector

76. In order to secure financial mechanisms and partnerships with the private sector, it is recommended that Member States:

(a) Increase investment in disaster risk prevention and preparedness in agriculture and natural resource management in mountains in accordance with the priorities of the Sendai Framework for Disaster Risk Reduction 2015–2030, which recognizes that it is far more cost-effective to address underlying disaster risk factors than to rely on post-disaster response and recovery;

(b) Encourage a fast-track mechanism to facilitate the access of sustainable mountain development projects to climate and environment investment funds such as the Global Environment Facility and the Green Climate Fund, to build the resilience and adaptive capacities of the most vulnerable groups, mitigate climate change, support sustainable mountain food systems and conserve biodiversity;

(c) Support effective multi-stakeholder cooperation platforms, such as the Mountain Partnership Secretariat beneficiary fund that provides mountain communities and institutions with seed funds to address challenges and gaps (such as climate change adaptation, capacity development or value-chain development).

Governance and inclusive institutions

77. In order to promote good governance and inclusive institutions, it is recommended that Member States:

(a) Support effective, international multi-stakeholder cooperation platforms such as the Mountain Partnership;

(b) Increase national-level coordination across different government agencies, institutions, academia, economic actors, the private sector and communities to address such issues as disaster risk management and adaptation;

(c) Adopt a comprehensive approach to strengthening ecosystem resilience and reducing poverty in rural areas, including risk-informed and shock-responsive social protection policies and systems;

(d) Develop mountain-specific policies and multi-stakeholder governance mechanisms that take into account mountain complexity and integrate considerations of natural resource management, watershed management, sustainable water management, sustainable forest management, disaster risk reduction, biodiversity conservation, land degradation and desertification, agroecology and people's livelihoods;

(e) Formulate multisectoral, pro-poor development policies, strategies and programmes for mountains that integrate climate change and support the resilience of the rural poor, especially women and youth, and increase their adaptability to climate change impacts;

(f) Promote regional and local multi-stakeholder-based systems, partnerships and alliances that invite the active engagement of citizens and civil society and integrate different administrative levels and sectors.

Research and data

78. In order to enhance research and data on mountain-specific issues, it is recommended that Member States:

(a) Promote comprehensive, long-term monitoring and forecasting services to produce information for adaptation plans and reporting on mountain-specific targets within international policy frameworks such as the Sendai Framework for Disaster Risk Reduction 2015–2030, the Paris Agreement on climate change and the 2030 Agenda for Sustainable Development;

(b) Validate national data for the Mountain Green Cover Index, the indicator for target 15.4 of the Sustainable Development Goals, and improve its data accuracy and analysis at the country level for the implementation of appropriate policies aimed at restoring and protecting mountain environments;

(c) Increase the collection and dissemination of disaggregated mountain-related economic, social, environmental and meteorological data to underpin policy advice at the local, national, regional and international levels;

(d) Develop common data-collection methodologies for homogeneous databases;

(e) Increase support for mountain research and research networks to improve the observation and prediction of climate change and to provide relevant information in support of decisions and actions that enhance the resilience of ecosystems and society to global change and development pressures in mountains;

(f) Promote research that is socially relevant and focused on community needs;

(g) Record indigenous and traditional knowledge practices in mountain food systems.