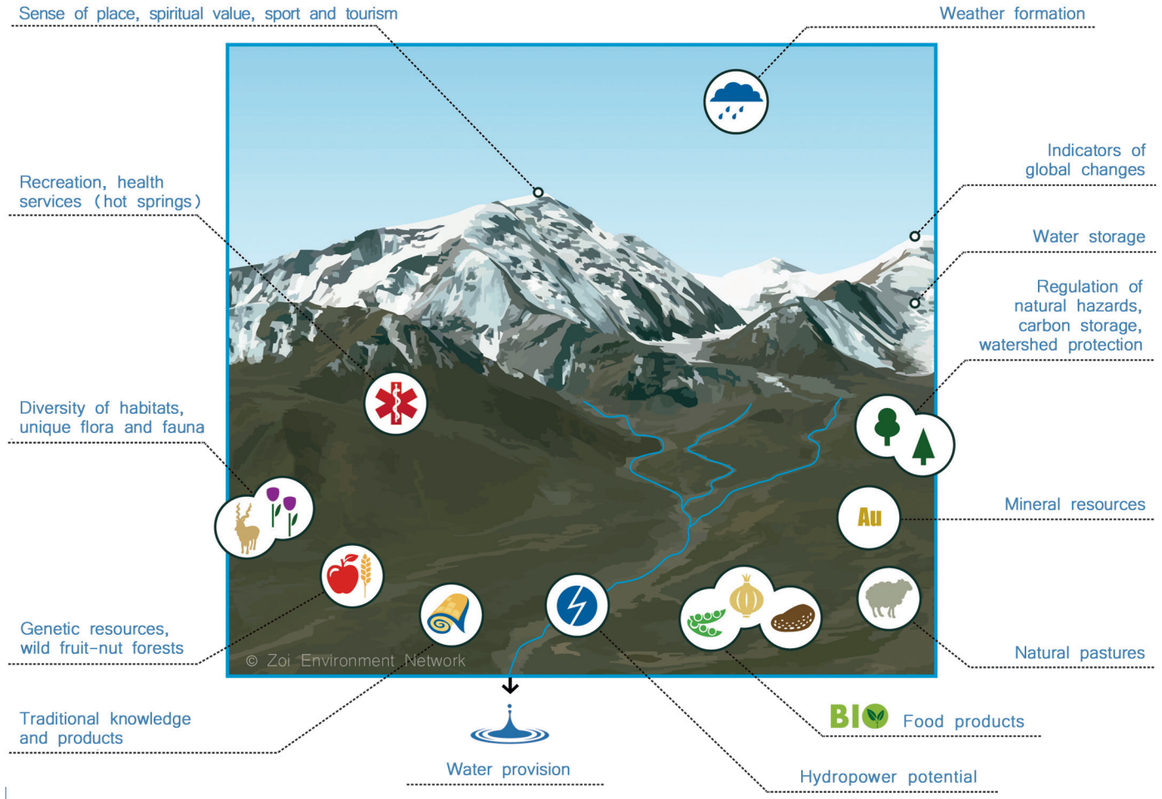
MOUNTAIN ECOSYSTEM GOODS AND SERVICES



Contributing Organizations:

Austrian Development Cooperation

Schweizerische Eidgenossenschaft
Confédération suisse
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Federal Department of Foreign Affairs FDFA
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WHY MOUNTAINS MATTER FOR ENERGY

A CALL FOR ACTION ON THE SUSTAINABLE DEVELOPMENT GOALS (SDGs)

Mountain Partnership

MOUNTAINS AND ENERGY: A CALL FOR ACTION ON THE SUSTAINABLE DEVELOPMENT GOALS (SDGs)

Sustainable mountain development should be a global priority given the multitude of services that mountains provide, among the most notable being water for half of humanity for drinking, irrigation and energy production. The pressing need to alleviate poverty in mountain regions is another reason for concerted action. Mountain people – who are among the poorest in the world – are key to maintaining these mountain ecosystems, which provide essential environmental goods and services to the global community.

Following the inclusion of mountains in Chapter 13 of Agenda 21, the action plan endorsed by the 'Earth Summit' in 1992, and the recent Rio+20 outcome document, **various stakeholders call for mountain issues to be covered by the SDGs, especially the goals that address topics relevant to mountains, such as energy.**

The following actions are needed to protect fragile mountain ecosystems and communities[1] in particular in developing countries:

- Recognize the invaluable contribution of mountains to the food, water and energy nexus;
- Recognize the potential for mountain countries to develop sustainable energy and energy efficiency solutions, which can contribute to the goals of energy security, climate resilience and economic development;
- Promote and expand sustainable energy and energy efficiency solutions in mountains including through: sustainable hydropower development, biomass, wind, solar and geothermal energy, while preventing and minimizing negative environmental and social impacts on mountain ecosystems and communities;
- Create and improve policies, frameworks and incentives to promote investments in sustainable energy solutions in mountain countries, also to spur opportunities for public–private partnerships;
- Improve access for mountain communities, in developing countries in particular, to modern, reliable and affordable sustainable energy solutions;
- **Support the establishment of mountain-related targets and indicators for the sector-specific Sustainable Development Goals related to energy:**

[1] While the recommendations specifically refer to mountain regions, they might also apply to other regions.

PROPOSED SDG TARGETS	PROPOSED INDICATORS
TARGET 1: "Integrate sustainable mountain development into country policies and programmes and stop the loss of environmental resources."	Number of countries supporting sustainable mountain development in their policies and programmes.
TARGET 2: "By 2030, increase the share of sustainable energy in the energy mix, including the adoption of adequate safeguards, especially in developing countries with fragile mountainous ecosystems.	Share of sustainable energy within the overall energy mix, in particular within developing countries with fragile mountain ecosystems.
By 2030, double the global rate of improvement in energy efficiency in buildings, industry, agriculture and transport in countries with fragile mountainous ecosystems."	Global rate of improvement in energy efficiency in countries with fragile mountain ecosystems.
TARGET 3: "Take joint action and improve efforts to work together at all levels to improve access for mountain communities, in particular in developing countries, to modern, reliable and affordable sustainable energy to facilitate the achievement of the sustainable development goals."	Proportion of population living in mountain regions with access to sustainable energy.


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MOUNTAINS AND ENERGY: KEY FACTS AND FIGURES

Mountains provide sustainable energy for downstream cities and remote mountain communities

Mountains contribute up to 80%, sometimes even 100%, of downstream river flow, and thus are a key resource for green economic growth.

Hydropower **is one of the main sources of sustainable energy in mountain regions:** hydropower is a leading source of energy in the European Alps. In Latin America, 85% of the hydropower energy is generated from mountains. Hydropower is also increasingly important in Asia and Africa.

Country	% Generated in Andes Mountains	Hydroelectric as % of Total Electric Supply (2009)
Argentina	34.4	34.9
Bolivia	100.0	35.6
Chile	93.1	50.4
Colombia	95.4	89.4
Ecuador	85.8	55.8
Peru	95.6	73.9
Venezuela	0.4	86.5
Total	**52.4**	**63.6**

Hydroelectric energy generation in the Andes © Condesan.

The total estimated hydropower potential in the Hindu Kush Himalaya (HKH) – with China's HKH region included – is 500,000 MW © ICIMOD.

Solar power **can also be efficiently produced in mountains** and other cold regions – contrary to popular belief. The Himalayas and Tropical Andes are particularly promising locations for the development of solar energy, where installations could produce approximately 20% more energy than they could at sea level.

Wind power **is a vast, but largely untapped source of potential sustainable energy in mountains.** Even at lower elevations, the terrain and topography of mountains can create wind corridors with high wind speeds that are ideally suited for wind turbine development. However, this potential remains largely untapped. For example, 33% of the European Economic Area (EEA) is considered mountainous, but generally only a small fraction of wind turbine capacity is installed in these regions.

Sustainable energy **brings benefits to human health, the mountain environment and global climate.** Reduced dependency on firewood, for example, can lead to fewer respiratory diseases, improved water and soil conservation, and less black carbon (soot) in the atmosphere – one of the most widespread short-lived climate pollutants.

However, many sustainable energy sources in mountains remain unused or underutilized. The Himalayan region, for example, could produce up to 500,000 MW from hydropower (roughly the equivalent of 500 nuclear plants). Currently only 9% of the potential in the Himalayas is developed. Awareness about the opportunities and constraints of sustainable energies in mountain regions globally is also lacking.

Adequate environmental and social safeguards are needed

- **Mountains contain some of the most fragile ecosystems on the planet.** These ecosystems, and the communities that live within them, are among the most vulnerable to climate change and other environmental changes. Mountain glaciers are dramatically retreating in almost all regions of the world, resulting in the diminishing of mountain water supply and in some cases leading to further tensions over water and energy use.

- **Impairment of these fragile ecosystems is often not avoided/minimized when developing sustainable energy solutions.** For example, large and small-scale hydropower development must adhere to established global standards and safeguards to avoid and minimize environmental and social impacts, which can include the loss of agricultural and forested land, changes in ecosystems and biodiversity, and a lack of benefits to local mountain communities. Adequate participatory planning and management, including the involvement of local communities, is critical for sustainability. Energy needs should always be carefully balanced with environmental and social concerns.

- **Improving energy efficiency can have a significant positive impact on the environment.** For example, replacing wood-burning stoves with clean cooking stoves reduces by 50% the use of wood that many rural communities are still heavily dependent on.