



# PeakED: Environmental Involvement and Education for young entrepreneur and volunteers

## **Guidelines for Green Audit & Green Options**



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## 1 EXECUTIVE SUMMARY

Mountain ecosystems serve as critical hubs for global biodiversity, sustainable development and local economic resilience. The PeakED project – Environmental Involvement and Education for Young Entrepreneur and Volunteers – was designed to address these complex environmental challenges. Through the implementation of participatory methodologies like Living Labs (LLs), the project pioneers context-sensitive solutions. This expanded document provides actionable guidelines for conducting green audits, designing sustainable outdoor activities, and implementing "green options" to protect mountain environments.

## 2 THE MOUNTAIN ECOSYSTEM CONTEXT

Understanding the environment is the first step in protecting it. Mountains are not static landscapes; they are dynamic ecosystems that regulate microclimates and sustain both unique flora and historical human settlements.

### **Environmental and Historical Significance**

#### Jordan (Jabal Umm ad Dami)

- Jabal Umm ad Dami is the highest peak in Jordan, standing at 1,854 meters above sea level within the dramatic landscapes of the Wadi Rum desert.
- The mountain's geology features rugged terrain, weathered sandstone formations, jagged rocky outcrops and striking evidence of ancient erosion.
- It supports a sparse yet resilient desert ecosystem, where native vegetation has uniquely adapted to survive in harsh, arid conditions.
- The area demonstrates how ancient civilizations adapted to the unforgiving climate, evidenced by structures like the nearby Nabataean dam used to capture and store precious water.
- The mountain's presence is crucial for sustaining desert life, as the presence of certain wildlife (such as crows) signals hidden underground water reservoirs essential for Bedouin communities and desert inhabitants.

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### Poland (Carpathian Mountains)

- The Carpathian Mountains form a vital ecological corridor in Eastern Europe, harboring some of the continent's most expansive old-growth forests and diverse alpine ecosystems.
- They act as a crucial refuge for large native European wildlife, including brown bears, gray wolves, and Eurasian lynxes.
- Historically, the rugged Karpaty region shaped the distinct cultural identity of Polish highland communities, who relied on the mountains for natural defense, isolation and traditional pastoral livelihoods.
- Today, this dynamic ecosystem faces mounting pressures from climate change altering snowpacks, illegal logging and habitat fragmentation caused by modern infrastructure and tourism development.

### Bulgaria (Rila Mountains)

- The Rila Mountains are the highest mountain range in Bulgaria and the entire Balkan Peninsula, renowned for their complex network of deep glacial lakes and expansive alpine meadows.
- They serve as a critical watershed, regulating the hydrology of several major rivers that sustain local agriculture, flora and human settlements.
- Historically, the remote and inaccessible peaks provided sanctuary for spiritual and cultural centers – most notably the Rila Monastery – which helped preserve Bulgarian heritage and religious practices through centuries of foreign rule.
- The range is currently challenged by shifting tree lines, soil erosion and biodiversity loss resulting from global warming and unregulated alpine tourism.

### Greece (Mount Olympus)

- Mount Olympus is the highest mountain in Greece, internationally recognized for its exceptional biodiversity and protected as a World Biosphere Reserve and National Park.
- The mountain's dramatic elevation changes and proximity to the sea create distinct microclimates, supporting a vast array of endemic plant species found nowhere else in the world.

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- Culturally and historically, Olympus holds profound significance as the mythical home of the ancient Greek gods, deeply intertwining its imposing geological presence with human history and mythology.
- Modern conservation efforts on Olympus are heavily focused on mitigating the severe risks of shifting Mediterranean precipitation patterns, over-tourism on popular trails and the increasing threat of devastating summer wildfires.

### **Biodiversity and Survival in Arid Climates**

- Mountain ecosystems support sparse yet resilient vegetation uniquely adapted to harsh, arid conditions.
- The presence of specific wildlife, such as crows, often signals that mountains contain hidden underground water reservoirs.
- Endemic species are increasingly threatened; local communities have noted that climate change has led to the decline and extinction of certain mountain plant species.



**Source:** Magnific

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### 3 GREEN GUIDANCE: STRATEGIES FOR PROTECTION AND PRESERVATION

To effectively protect mountain areas, interventions must be a mix of active environmental restoration and sustainable economic empowerment for the communities that call these regions home.



Source: Magnific

#### Active Environmental Restoration

- Establish dedicated environmental heritage restoration programs focused on preserving regional ecology.
- Create local plant nurseries equipped with greenhouses to cultivate and repopulate endangered native plants.
- Focus on high-impact, regionally specific flora, ranging from endemic alpine herbs and medicinal plants to critical native trees essential for the local ecosystem.
- Plant native trees and vegetation in vulnerable valleys and slopes to stabilize the soil, prevent erosion and combat habitat degradation.

#### Sustainable Agriculture and Animal Care

- Promote natural grazing practices that allow native livestock and local wildlife to forage indigenous plants instinctively, reducing the strain on the ecosystem.

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- Ensure animals have access to a diverse diet of hardy native flora that provides essential minerals and nutrients.
- Monitor local water usage carefully; adapt watering schedules and practices to the season and the specific biological needs of the local fauna to conserve vital mountain watersheds.

### **Community and Economic Empowerment**

- Support local cooperatives and community associations that implement projects merging community development with climate change adaptation.
- Foster sustainable eco-tourism initiatives that provide authentic cultural experiences without depleting natural resources.
- Train community members in income-generating skills like traditional handicrafts, sustainable gardening, and local food preservation to reduce reliance on resource-heavy industries.

## **4 DESIGNING SUSTAINABLE OUTDOOR ACTIVITIES AND GREEN WORKSHOPS**

Educational activities in mountain regions must balance experiential learning with strict environmental stewardship. The Living Lab methodology serves as the gold standard for this balance, fostering dynamic collaboration and the co-creation of solutions.

### **1. Pre-Activity Preparation and Logistics**

- Conduct a thorough risk assessment of the rocky mountain terrain, accounting for slippery parts and varying altitudes.
- Provide participants with strict packing guidelines: recommend breathable pants, hiking shoes, windbreakers and sunhats or headscarves.
- Ensure participants understand that mountain microclimates fluctuate drastically; areas can be simultaneously cold, windy or intensely hot.

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## 2. Structuring a Mountain Living Lab

| Day Focus   | Key Activities                                                                                    | Learning Outcomes                                                                                          |
|-------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Exploration | Jeep tours to the mountain base and guided hikes led by local experts.                            | Direct observation of natural features, identification of environmental challenges and team bonding.       |
| Ideation    | Brainstorming sessions, group formation based on expertise and initial project development.       | Cultivation of entrepreneurial thinking and collaborative problem-solving regarding mountain conservation. |
| Prototyping | Expert panel discussions with ecologists and policymakers, followed by field testing of concepts. | Validation of sustainable solutions through direct feedback from local stakeholders.                       |

## 5 INTEGRATING CULTURAL HERITAGE INTO GREEN EDUCATION

A mountain is not just a geological formation; to the indigenous and local communities that inhabit them, mountains are a deeply ingrained cultural anchor. Environmental education is incomplete without this human element, as local knowledge is key to understanding and preserving both ecological and cultural heritage.

### Learning from Local Communities

- Incorporate local storytelling into workshops: Communities often assign specific names, legends, and historical narratives to mountain peaks, reflecting deep cultural heritage. For example, Bedouins in Wadi Rum share stories etched into the rocks by their ancestors, just as Greek communities pass down the rich mythological narratives tied to Mount Olympus, or Polish highlanders (Górale) share folklore of the Karpaty.
- Recognize mountains as symbols of endurance and spirituality: Acknowledge the spiritual presence and resilience that mountains inspire in local inhabitants. This can be seen in the deep spiritual connection of the Bedouins beneath the desert stars, or the historical sanctuaries built into the mountains, such as Bulgaria's Rila Monastery.
- Acknowledge historical reliance for survival: Teach how historical communities utilized mountains for practical survival. This includes relying on them for shade and

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protection from extreme weather, reading the landscape (like following crows) to find hidden natural water reservoirs, and using mountain passes to guide travel routes and pastoral grazing.

- **Integrate traditional food and hospitality:** Connect participants to the land through local culinary and hospitality traditions. Depending on the region, this could mean experiencing Bedouin dinners around the fire, Saj bread baking, and traditional Arabian coffee brewing, or exploring the traditional pastoral cheese-making practices of the Polish Tatra mountains and Greek highland villages.

## 6 GUIDELINES FOR CONDUCTING A GREEN AUDIT IN MOUNTAIN AREAS

A Green Audit is a systematic, evidence-based assessment of an area's environmental health, the specific impacts of human activity, and the overall effectiveness of current conservation efforts. In fragile mountain ecosystems, this audit must combine rigorous ecological observation with deep community integration.

### Step 1: Baseline Environmental Assessment

- **Conduct Field Surveys:** Begin with a rigorous on-the-ground exploration to observe current biodiversity, noting the health, distribution and density of both flora (e.g., desert shrubs, wild thyme) and local fauna.
- **Evaluate Infrastructure Impact:** Document human-made features, critically evaluating their historical context and modern impact on the landscape. Compare historical engineering feats, such as ancient dams designed for natural water capture, with modern infrastructure to understand long-term sustainability.
- **Map Vulnerability Zones:** Actively identify and map specific areas suffering from environmental stress, such as regions experiencing severe soil erosion, unregulated overgrazing or aggressive tourist foot traffic.

### Step 2: Stakeholder Consultation

- **Engage Diverse Experts:** Conduct structured interviews and host expert panels that include local community leaders, ecologists, policymakers and residents to gain a holistic view of the region's challenges.

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- Use Generational Knowledge: Gather qualitative data on historical environmental changes to establish a chronological baseline. Local women and elders can provide critical, generational insights into which native plant species have faced decline or extinction over recent decades due to climate shifts or human activity.
- Assess Economic Drivers: Discuss how local economic activities (like agriculture or tourism) interact with the environment, ensuring the audit captures the socio-economic realities of the region.

### **Step 3: Prototyping and Field Evaluation**

- Design Targeted Interventions: Develop initial plans or physical prototypes aimed at mitigating the identified environmental risks. This could include testing a new restricted eco-trail, localized planting of endangered seedlings in a greenhouse or a new water-conservation protocol.
- Conduct Real-World Testing: Test these prototypes directly in the field during the audit process to assess their real-world viability against unpredictable mountain weather and terrain.
- Iterate via Community Feedback: Solicit immediate, on-site feedback from local stakeholders to ensure the proposed solutions are not only scientifically sound but also culturally sensitive and practically viable for daily use.

### **Step 4: Reporting and Future Strategy**

- Synthesize Findings: Compile all quantitative data and qualitative feedback into a structured, accessible presentation tailored for all participating stakeholders.
- Facilitate Open Dialogue: Host an open discussion to review the findings, fostering a transparent environment where the community can voice final concerns or suggest practical improvements.
- Develop a Scalable Roadmap: Clearly identify scalable follow-up actions and establish a timeline for implementation. The ultimate goal is to ensure the long-term sustainability and resilience of the mountain ecosystem far beyond the initial audit timeline.

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## 7 GLOBAL INITIATIVES AND THE 2030 AGENDA: ALIGNING MOUNTAIN TOURISM WITH THE SDGS

Mountain tourism development must be strategically managed to ensure it actively contributes to the 2030 Agenda for Sustainable Development, particularly in combating desertification, land degradation and biodiversity loss. By examining cross-regional projects, we can identify the actionable elements necessary to align tourism with the Sustainable Development Goals (SDGs).

### **Case Study 1: Disi Women's Cooperative Association (Jordan)**

- **The Initiative:** A local association based in Wadi Rum dedicated to empowering women through economic programs, authentic cultural tourism and environmental heritage restoration.
- **Successes:** The successful implementation of the Bedouyat Program provides visitors with authentic cultural experiences – such as traditional cooking, storytelling, and art – while directly generating employment for local families. Environmentally, the cooperative successfully cultivated and planted endangered native species, including planting 1,000 Ghadha trees in natural valleys to stabilize soil.
- **Challenges:** The cooperative had to combat the near-extinction of native plants caused by unmanaged tourism and overgrazing over the past decade, while simultaneously working to overcome entrenched social and cultural barriers for women in the region.

### **Case Study 2: MOVING (MOuntain Valorisation through INterconnectedness and Green growth)**

- **The Initiative:** The EU-funded Horizon 2020 MOVING project (2020-2024) was designed to build capacities and co-develop policy frameworks across Europe. By establishing Multi-Actor Platforms (MAPs) in 23 diverse mountain regions across 16 countries, the project aimed to create new, sustainable value chains that contribute to the resilience of mountain areas against climate change.
- **Successes:** The project successfully delivered a comprehensive package of "Policy Tools for Mountain Areas," which included participatory vulnerability matrices and spatial maps. These tools guide decision-makers in upgrading mountain value chains – such as sustainable eco-tourism, traditional forestry,

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and high-altitude agriculture – so they respect socio-ecological systems. It also produced a strategic repertoire of 30 actionable recommendations to secure sustainable mountain development in post-2027 EU policies.

- **Challenges:** The initiative had to navigate and address severe overlapping crises in mountain areas, including the steep decline of rural productive activities, demographic shrinkage, and the heightened vulnerability of local bio-physical assets (such as aging forests and shifting water reserves) due to the accelerating impacts of global climate change.

### Key Elements for SDG-Aligned Mountain Tourism

To ensure that future tourism development in mountain regions contributes positively to the SDGs, several key elements must be integrated into project design:

- **Participatory Innovation:** Tourism models must utilize participatory methodologies, such as Living Labs and Multi-Actor Platforms, to empower local communities and co-create locally adapted solutions.
- **Direct Economic Empowerment:** Tourism must be directly linked to local income generation through community-based initiatives, ensuring economic benefits remain within the local ecosystem.
- **Active Biodiversity Conservation:** Sustainable tourism must go beyond "do no harm" and include active environmental restoration, such as restoring endangered native plants and combating habitat fragmentation.
- **Climate Resilience and Education:** Initiatives must build climate awareness and resilience by combining green entrepreneurship with comprehensive environmental management training.

## 8 CONCLUSION

The intersection of entrepreneurship, community engagement and environmental stewardship is vital for the future of mountain regions. The Peaked project demonstrates that addressing complex environmental challenges – such as biodiversity loss and land degradation – requires a highly holistic strategy. By utilizing participatory models like Living

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Labs, we serve as an incubator for environmental citizenship, empowering individuals to actively manage and protect their ecosystems.

At the heart of this sustainable transition is the empowerment of young people. By combining entrepreneurship education with sustainability-oriented learning, youth are equipped to develop innovative, green business ideas that respect and protect fragile mountain ecosystems. This hands-on approach fosters a more active and environmentally conscious generation. It ensures that future entrepreneurial initiatives will inherently contribute to environmental protection, climate awareness, and community resilience. The experience and knowledge gained through these collaborative activities provide a strong, lasting foundation for future youth-led initiatives that will continue long beyond the duration of the project.

Furthermore, creating scalable, sustainable solutions requires deeply respecting and harnessing the collective knowledge and cultural assets of mountain communities. From the Bedouin cooperatives in Jordan nurturing endangered native plants to the highland communities of Europe, local heritage provides the ultimate blueprint for sustainable adaptation. The protection of these ecosystems is not merely a scientific or academic endeavor; it is a collaborative commitment to preserving the delicate, historical balance between nature and human life.

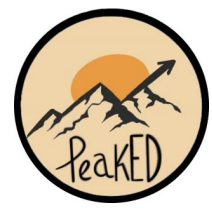
Ultimately, whether standing on the peaks of the Carpathian, Rila or Pindus mountains or sinking into the soft, wind-sculpted sands at the base of Jabal Umm ad Dami, we are reminded of our place within these environments. Taking a moment to reflect beneath the infinite, starry night sky of these majestic landscapes instills a rare sense of peace and a profound connection to the timeless spirit of nature. It is this deep, humbling connection – embraced by the mountains and the stars – that will inspire continued action, resilience and sustainable development for generations to come.

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## Partners:



Innovation Hive



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