

# THE MOUNTAIN INSTITUTE



**2011  
Annual Report**



## Letter from the Executive Director

For 40 years The Mountain Institute has and continues to sustain and protect mountain people, environments and cultures. We work hand-in-hand with mountain communities to address their most critical challenges including poverty, environmental degradation, water scarcity, climate change, hunger, education and marginalization. In the search for solutions we respond to these challenges by **listening to the voices of mountain communities** and, with them, **create programs that make a lasting difference**.

We are the only international non-profit organization solely devoted to helping mountain communities create and sustain environmentally responsible development globally. Our staff works in some of the highest and most remote regions of the world, addressing issues that affect us all, whether we live upstream or downstream: clean water, the environment, health, livelihoods, and the future for children.

We work in the world's oldest mountain range (the **Appalachians**), the world's longest mountain range (the **Andes**) and the world's highest mountain range (the **Himalayas**). Most of our staff are mountain people, born in the communities where they work. They are trusted "insiders," not outsiders. We apply lessons we learn from each community and mountain range to mountain communities and ranges across the globe.

### **We listen to communities; and respond to their needs including:**

- Educating kids and their teachers where education is most needed;
- Improving agriculture where crops are failing and people are chronically hungry;
- Conserving fragile mountain environments and the environmental services they provide;
- Strengthening community leaders and institutions where people are powerless, marginalized and angry; and
- Creating mountain entrepreneurs where poverty is endemic and families can't pay for kids' shoes or schooling.

And all this means that each dollar you give us is stretched farther... is used more effectively... and will achieve lasting results.

**Examples of our work:** Because mountain problems are complex, our solutions are designed to resolve many urgent problems simultaneously. For example, our programs increase family incomes in ways that also conserve the environment and protect mountain cultures. Here are some examples of the extraordinary work that contributions from our supporters enable us to do:

- **Creating Entrepreneurs in Nepal:** Deo Prakash Tamang's family was often hungry and his six children rarely attended school. We trained Deo to grow, harvest and sell valuable medicinal plants. His family's income grew from \$175 a year (48 cents a day) to over \$3,000 a year. Now, Deo can feed his family; but also he can afford to send his two daughters to boarding school. Due to TMI's

program, over 13,000 farmers in Nepal, like Deo, now grow and sell these valuable plants... creating lasting change in remote mountain communities. Now, we are bringing this program to Peru, training Quechua families to grow medicinal plants, helping transform their lives and that of their children.

- **Education in Appalachia:** For over 39 years, we have been educating Appalachian kids and their teachers on Spruce Mountain, the highest mountain in West Virginia. Our science and outdoor education programs transform education, turning passive learners into passionate advocates for science, the outdoors and the environment. As one child said after planting saplings to protect a mountain headwater, "I never realized what a difference I could make in the lives of so many people."
- **Adapting to a World Without Glaciers:** Peru's glaciers are melting at unprecedented rates, and Peruvians depends on glacial melt for their drinking water. TMI is working to better manage alpine meadows to become "green glaciers," storing water for Peru's future. Better-managed meadows also produce healthier livestock, meaning more income for Quechua communities. This improves the lives not only of the families we work with, but millions of Peruvians who live downstream.

Mountains are revered and respected, but they are vulnerable. We advocate for the mountains. It is important to save rainforests and oceans, but too few comprehend that mountains are equally important and equally at risk: Almost half of the world's biodiversity "hot spots" are in mountains and are threatened by habitat destruction, climate change and development. Mountains supply half the world's population with clean water for drinking and agriculture -- even in lowland areas far downstream. All of us depend upon the health and sustainability of mountains and mountain communities, who are the natural stewards of the mountains.

Our work in the mountains is internationally recognized as excellent. Our staff have won the Sir Edmund Hillary Foundation's Mountain Legacy Medal twice. We have received grants from the U.S. Agency for International Development, the National Science Foundation, Ford Foundation, MacArthur Foundation, development agencies of other governments, and contributions from hundreds of individuals and family foundations that cherish the mountains and mountain communities.

We are trusted by mountain communities and host governments everywhere we work. We thank all our supporters who enable us to listen to mountain communities to bring them lasting and positive change.



Andrew Taber, D.Phil.  
Executive Director

# **The Mountain Institute's Accomplishments in 2011**

During 2011 The Mountain Institute implemented its global work through three regional and one crosscutting program. These are the North America Program, The Andean Program, the Asia Program and the Science and Exploration Program. Primary accomplishments are outlined below for each of these programs. Over this period the Institute maintained its headquarters in Washington, D.C., with financial and administrative support run out of our office in Morgantown, West Virginia.

## **NORTH AMERICA PROGRAM**

TMI was established in 1972 in the Appalachian Mountains of West Virginia, where its work focused on experiential and leadership education for West Virginia's youth. This work was based at a 400-acre nature preserve on the slopes of Spruce Knob, West Virginia's highest mountain, where the Appalachia Program continues its educational programs. Over the years, programming in Appalachia has expanded its focus to include a wide range of cultural and environmental conservation programs. In recent years, the Program has expanded to include a focus on energy and water issues. In addition to our work in the Appalachian Range, TMI has also developed a series of projects around cultural, conservation and education needs on public lands elsewhere in the United States, including in and around National Parks, National Forests and National Wildlife Refuges. We also offer mountain celebrations and educational programs with astronomers, long-distance runners and homesteaders at Spruce Knob.

### ***Outdoor Education***

Nearly 2000 students from Appalachia and eastern seaboard served with customized outdoor education curricula, ranging from science-based lessons to leadership and character development; 30 teachers participated in professional development workshops; educational preserve maintained, managing 400 acres of upland landscape, a mosaic of meadows and spruce forests; stream restoration service projects led by TMI staff in West Virginia communities for 10 schools.

In Washington state, curriculum development was the focus for both Japanese and American teachers as part of Mt. Rainier National Park's "sister mountain" relationship with Mount Fuji communities. A previously planned exchange was postponed due to the earthquake in Japan.

## ***Energy***

The past year saw completion of an analysis of barriers to wind development in a 5-state region of central Appalachia, as part of a Department of Energy grant. Simultaneously, the Appalachia Program; launched a community-based solar project offering investment to local residents. Policy and regulatory practices create barriers to solar deployment, and part of the project will include public awareness of opportunities that can exist, and others that could, with improved legislation.

## ***Mountain Public Awareness***

The traveling art exhibit, “Reflections: Homage to Dunkard Creek,” featuring 90 artists rendering 90 species that died in a fish kill event due to coal mine wastewater contamination in 2009, was launched. The exhibit has stimulated water quality seminars, public presentations, educational fora and fundraisers, at a time when water quality concerns are rising due to increased drilling in Marcellus shale region. Exhibit has been displayed at 7 venues from Charleston, WV to Pittsburgh, PA, and will continue to travel into 2013.

## ***Cultural Conservation and Public Lands***

TMI is also working in other parts of the United States, in particular during 2011 with the Southern Paiute on conservation and sustainable natural resource use in Spring Mountains, Nevada, at the Desert National Wildlife Refuge Complex. With US Forest Service and tribal leaders, TMI helped re-introduce traditional gathering traditions (pine nuts) and established a recommended consultation process for federal government and tribal governments to interact to identify opportunities for co-management of key resources. With US Fish and Wildlife Service, TMI provided guidance and input on interpretive facilities that re-frame cultural patterns and heritage on those lands through visitors’ centers and signage.

## **ANDEAN PROGRAM**

The Mountain Institute's Andes Program was established in Peru in 1996 during a time of rapid social change in the mountain communities of the northern Andes. Traditional means of livelihood were in decline at the same time that large-scale mining and hydroelectric projects and tourism were rapidly growing, leading to conflicts between the private sector and local people, not to mention the degradation of mountain environments. To address these issues, TMI developed comprehensive community-based projects to demonstrate the potential to diversify local livelihoods through community-based tourism and protection of biodiversity hotspots. TMI is responding to the emerging challenge of climate change in Peru. The country is already being impacted by the rapid loss of its mountain glaciers that function as nature's water towers for 70% of the population who lives in the desert coastal area of the country. TMI is working with local communities and municipalities to pioneer adaptations to the loss of these glaciers and the services and resources they provide.

### ***Peaks to Coast: Building Climate Change Awareness and Resilience in the Ancash and Piura Watersheds of Northern Peru***

This program has trained both rural communities, municipalities and agricultural water users located in the coastal areas that benefit from conservation work in the highlands. By bringing together these multiple social actors, TMI has contributed to dialogue and reduction of potential conflicts over access to water. Stakeholders in the highlands and the coast are already starting adaptive responses to climate change. As a result of this project, over 5,000 water users in Piura, northern Peru have initiated a "Paramo Water Fund" which is supporting the restoration of highland ecosystems that retain water. These water users have built, with TMI support, an Interpretation Center to educate children and farmers on the importance of protecting the headwaters of the watershed. Thus we are moving forward to make a reality the idea that alpine grasslands can become the "green glaciers" of the future. Illustrative accomplishments in 2011 included:

- A total of 331 people were trained in climate change adaptation. Of this, 281 men (177) and women (104) were from rural poor areas; and 50 were representatives from municipal governments.
- Of our trainees 123 (100 men and 23 women) were engaged in activities that demonstrated actual application of the training and increasing capacity to adapt to climate change impacts.

- Twelve mountain communities prepared and presented watershed management proposals to their local governments as a result of TMI training in climate change adaptation.
- One mountain community created a native forest reserve to protect its water sources and was officially recognized by the Peruvian Government (Ministry of Environment).
- Two communities established land use management plans to improve protection of their water sources.
- With support from TMI the Commonwealth of Mountain Municipalities expanded from an initial group of 5 municipalities to 10. They also obtained Peru's central government official recognition from the Prime Ministers office, becoming the first network of local governments dedicated to respond to climate change. This commonwealth developed seven project proposals for the regional public budget for 2012 for a total of over \$2.9 million dollars, and three more project proposals were presented for consideration in the 2013 regional public budget.
- Based on the previous year (2012) recognition that the conservation of mountain ecosystems (Paramo) are strategic to water security of the Piura region in Northern Peru, the government has proposed that the entire ecosystem (approximately 130,000 hectares) becomes a protected area. TMI developed all the basic information required for this proposal.
- In 2011, Piura's "Strategy for Climate Change" was completed. TMI participated in the technical group that provided support to this policy document. Piura's strategy was approved in December 2011 and includes a section on mountain ecosystem to increase water security for the entire region.
- A group of approximately 10,000 farmers in Piura, associated in the *Junta de Usuarios de San Lorenzo* (JUSAL) [San Lorenzo Water Users Association] completed their climate change adaptation plan, which included the launching of a Water Fund destined to protect mountain ecosystems (Paramo) that regulate water for the dry coastal areas.

### ***Andean Paramo Conservation***

Based on a 1997 TMI ecological assessment of this northern alpine wetlands/grasslands ecosystem (the Paramo) in Ecuador, TMI partnered with EcoCiencia and the University of Amsterdam to design and implement a project to protect the water regulation functions of this fragile and critical landscape by creating sustainable development opportunities for mountain communities using these ecosystems. Since then, the project has expanded to Venezuela, Colombia and Peru.

The project currently is funded by GEF-UNEP and is TMI's flagship project in Piura in northern Peru. Specific programs in 2011 included:

- TMI supported four mountain communities that developed and presented seven project proposals to the municipalities of Ayabaca and Pacaipampa for public investment in 2012.
- One conference on citizen participation and Paramo conservation was organized in the city of Piura. Participants engaged policy makers providing ideas for the management of the recently proposed Paramo conservation area.
- The following materials documenting project activities were collected in the project web page and will be published in 2012:
  - Participatory Management Plans in Piura and Cajamarca (<http://www.condesan.org/ppa/node/1812>)
  - Conservation agreements (<http://www.condesan.org/ppa/node/1815>)
  - Educational materials in paramo conservation <http://www.condesan.org/ppa/node/1828>

### ***Great Inca Road Project in Piura, Peru***

This project concluded in May 2011 with a series of publications and other results including an agreement signed between TMI and Peru's Ministry of Culture to cooperate in scientific research on the Cultural Landscapes of Peru. Publications included:

- Novoa J. et.al. 2011. The Andean Wildlife of Huancabamba. TMI, Piura.
- Villegas P. Use of Plants in the Traditional Medicine of Huancabamba. TMI, Piura.



## **ASIA PROGRAM**

TMI's conservation programs in Asia started in the mid-1980's with the "Heart of the Himalaya" initiative for the establishment of two new mountain protected areas: the Makalu-Barun National Park in Nepal, and the Qomolangma (Mt. Everest) Nature Preserve in the Tibet Autonomous Region of China, (Tibet). Both were founded on the principle of participatory design and management between park managers and local communities. These pioneering projects in community-based project design and collaboration between communities and governments in the management of natural resources have become the basis for many of TMI's programs. During 2011 our Asian work was primarily concentrated in the Himalayas of Nepal.

### ***Food For Enterprise***

TMI is working in partnership with the UN World Food Programme to provide food and community development assistance to food-scarce regions of Nepal. Since February 2008, TMI has delivered over 8,800 metric tons (over 19.4 million pounds) of rice and lentils to 27,168 farming families in extremely remote villages in mid-western Nepal affected by severe drought. In exchange for the food, the community's work on projects focused on creating productive assets and helping communities adapt to climate variability. In 2011-2012 TMI helped complete 56 larger community projects including improved irrigations canals, community nurseries for cash crops, boundary wall protection projects (to minimize losses from free ranging livestock) and other projects that helped increase food or cash crop production. These projects meet basic but critical needs and help create the foundations for sustainable mountain enterprises. Most recently TMI has been working in partnership with the UN World Food Programme to deliver 1463 metric tons (3.25 million pounds) of rice, feeding 5,417 households in the Humla district of northwestern Nepal near the Tibetan border and will complete 53 enterprise and climate resilience projects.

### ***Medicinal & Aromatic Plants (MAPs) Cultivation and Forest Conservation***

The Khangchendzonga area of northeastern Nepal is a global biodiversity hotspot and requires coordinated landscape-level conservation efforts. Local inhabitants are poor and natural resource-dependent, especially on forest products and pastureland. India's national ban on grazing has forced herders to shift their livestock into Nepal, putting increased pressure on traditional grazing areas and forcing herders to cut forests to

create new grazing areas. The goal of this multi-year project is to conserve the biodiversity of the Khangchendzonga landscape and improve local livelihoods.

Since 2003, TMI has worked to conserve the biodiversity rich corridors of the Khangchendzonga landscape in Nepal, covering more than 1670 square kilometers. By the end of 2011, the project had trained over 6,500 farmers to cultivate medicinal and aromatic plants as an alternative to the wild collection of endangered species, which degrades the landscape, causes erosion and risks causing localized extinction of several important plant species. The sale of cultivated medicinal and aromatic plants by these farmers raised more than US\$ 1,400,000 by the end of 2011. Wild populations of these economically and ecologically important plants are also increasing.

In addition, working closely with more than 400 herders, TMI has helped reduce livestock herds that graze in these biodiversity rich forests by more than 25%, and reduced the creation of new pastures in these forests by 85%. These forests contain some of the best red panda habitat in the Eastern Himalaya. Villagers have planted more than 800,000 seedlings of native forest species, reforesting and actively managing over 3,325 hectares (8.2 million acres) of degraded forestland. TMI continues to expand these programs to more communities in the Sacred Himalayan Landscape of Central and eastern Nepal, helping resource dependent families increase their livelihoods while protecting local biodiversity. As the number of farmers involved in the project expands and as the production from on farm plots increases, farmers trained by TMI are able to train their neighbors without further project assistance, increasing the numbers of trained farmers. Thus, the actual effect of our project is doubled through these local efforts.

During 2011 TMI continued strengthening the Medicinal and Aromatic Plant Agricultural Cooperatives formed in 2010 to represent farmer's interests. The Cooperative now has 12 sub-branches and approximately 13,500 farmer members. In particular, in the Upper Arun valley, a remote and inaccessible valley en route to Tibet, TMI helped train more than 450 farmers to cultivate 4 different species of high value, medicinal and aromatic plants and they have planted more than 25 hectares with various species. TMI is working with 14 local NGOs to conduct this project, building local capacities and ensuring longer-term sustainability of project interventions.

### ***Community-Based Monitoring of Keystone Species***

In 2011, TMI working in partnership with the Red Panda Network-US conducted red panda frequency and distribution surveys in 9 different administrative areas of East

Nepal. Based on field results, the project determined that while red panda populations remain viable, the species continues to be at risk and requires immediate attention to protect their habitats. TMI is designing long-term habitat conservation projects to conserve the entire landscape. TMI anticipates that the skills transmitted for communities to monitor keystone species will form the basis for community monitoring of other natural resources including monitoring of forest carbon.

### ***Restoration of the Pangboche Monastery, Solu-Khumbu, Nepal***

In June 2011, The Mountain Institute completed the restoration of the 18<sup>th</sup> Century Tibetan Monastery at Pangboche, Nepal, en route to Mount Everest. The project was funded by the US Ambassadors Cultural Preservation Fund (ACPF), and HE Ambassador Scott Delisi and a group of 7 US Embassy staff visited the monastery to inspect the progress and officially open the restored facility. While in the field, Ambassador Delisi and US Embassy staff also met with Dr. Alton Byers, who was conducting glacial lake reconnaissance work at the time and were briefed on TMI's Glacial lake and climate change projects as well.

### ***REDD (Reducing Emissions through Avoided Deforestation and Degradation) in The Eastern Himalayas***

Wildlife Works Carbon (WWC) and The Mountain Institute are working to establish a pilot market based carbon storage project to conserve the biodiversity rich forests of a significant part of Nepal's Sacred Himalayan Landscape in Eastern Nepal. We have conducted a feasibility study and determined that the forests of 4 mountain districts in eastern Nepal are extremely important for storing forest carbon and provide critical habitat for red panda and other threatened keystone species such as now leopard and pangolin. TMI and our partners have meet with local community members, civil society representative and government officials at district, regional and national levels to explain the opportunities for market based forest carbon projects and seek their approval. WWG trained local partners and TMI staff and conducted an initial assessment of forest carbon stocks and found that the forests of Eastern Nepal store significant amounts of forest carbon and have tremendous value in the global voluntary carbon markets. We continue to have high-level meetings and community level consultations to encourage rapid endorsement of market-based systems so that Nepal's forest carbon can be monetized and on the ground conservation activities can take place. Work is on going and we hope to have national level endorsement of market based forest carbon projects within the next 12 months.

## **GLOBAL SCIENCE AND EXPLORATION PROGRAM**

TMI's Science and Exploration Program supported the work of other TMI programs during 2011 and expanded efforts through the two projects described below. It also is continuing in building and supporting a partnership between educators, rangers and interpretation specialists linking Mount Rainier National Park and Fujisan in Japan.

### ***High Mountain Glacial Partnership Project***

"The Threat from Above: A Survey of New and Potentially Dangerous Glacial Lakes in the Hongu and Imja Valleys, Eastern Nepal, Phase II" continued its pioneering work on potentially dangerous lakes in the Mt. Everest (Nepal) region thanks to generous contributions from the NGS-Waite Grant Program, The Mountain Institute, and the Arkay Foundation. The October-November 2010 fieldwork in the remote Hongu valley of Makalu-Barun National Park included a detailed assessment of nine potentially dangerous lakes never before studied. This was followed by a survey of the entire 100 km-long Hongu river valley to determine glacial lake outburst flood impacts on downstream villages, land and infrastructure.

In September, 2011, the "Andean-Asian Glacial Lake Expedition" to Imja lake in Nepal was successfully launched, a direct result of the GLOF research initiatives of preceding years. Funded by the NSF, USAID, and ICIMOD, 35 scientists from 15 different countries spent 21 days in a remote region of the Sagarmatha (Mt. Everest) National Park, exchanging experiences in the control and management of dangerous glacial lakes from Peru to Bhutan. Due to the success of the program, TMI and the University of Texas designed and are in the process of implementing the USAID-funded High Mountain Glacial Watershed Program in Nepal, Peru, and Tajikistan. The aim of the High Mountain-Glacial Watershed Program ("Program") is to increase awareness for the critical importance of high mountain glacial watersheds globally in the context of climate change, highland-lowland interactions, and ecosystem services. This will be achieved through the development of innovative high mountain tools, approaches, and the establishment of a unique high mountain Community of Practice. The Program will create enabling conditions necessary for local communities, governments, and stakeholders living in and/or dependant on high glacial watersheds to (a) build resilience to the impacts of climate change, (b) advance scientific knowledge of high mountain systems and processes, and (c) increase global awareness and support for the critical importance of high mountain glacial environments.

## ***Alpine Conservation Partnership***

"Protecting and Restoring the World's Alpine Ecosystems through National Geographic Explorer Collaboration and Exchange" continued to operate in 2011 with generous grant from the NGS-Blackstone Ranch Institute Challenge Grant, a program designed to promote collaboration between NGS Explorers and Grantees. NGS Explorers and TMI Grantees spent more than a month east of Mount Everest testing new forms of alternative energy (e.g., solar, wind, hydro and biogas), and experimenting with new technologies for communication. Among other improved communications strategies, the project is using social media techniques to reach the next generation of resource users and conservation professionals. Phase II of the project is planned for the fall of 2012 and spring 2013.

## **COMMUNICATIONS, PUBLICATIONS AND OUTREACH BY TMI**

During 2011, TMI publicized issues critical to mountain communities, environments and cultures. TMI also publicized its efforts to assist mountain people with these issues. Below is a partial list of such communication and outreach efforts:

TMI's promotional and educational video "Small Steps" is now on  
[www.mountain.org](http://www.mountain.org)

"Outburst" website (interactive map of the October-November 2010/2011 expedition) can be seen at <http://www.outburstfilm.com/>

National Geographic Project Page with narrated climate change slide show can be seen at <http://www.nationalgeographic.com/field/projects/alton-byers-project/>

The 2011 Hongu Glacial Lake Expedition blog can be seen at  
[www.skyshipfilms.com](http://www.skyshipfilms.com) (click on 'blog' at far right upper corner).

"Rise of the Climbing Scientist" AAC blog can be seen at  
<http://inclined.americanalpineclub.org/2011/02/altonbyers/>

A film by Daniel Byers on glacial lake outburst flood risks in the Hongu Valley, Nepal, can be downloaded at <http://skyshipfilms.com/files/natgeo-teaser.mov>

The Hongu Glacial Lake Expedition results were officially presented at the National Geographic Society. NGS also produced blogs, radio interviews, narrated slide shows, a special Andean-Himalayan page in the international NGS magazine, and will publish a photograph and short feature on the expedition in a forthcoming issue.

Repeat photographs from the Hongu Glacial Lake Expedition will be featured in a forthcoming book entitled Mountains (published by Rizzoli, NY), and were specifically requested by Al Gore for use in his forthcoming climate change presentations.

TMI senior staff led a Discovery Channel-Asia film crew in the Sagarmatha (Everest) National Park, under contract by the UNDP to produce a climate change film entitled "Himalayan Meltdown." The film premiered in June 2011 throughout Asia, Europe and North America.

Climate change: impacts and opportunities in the world's highest mountains. Invited photo essay and narrative. In: Education About Asia. Chattanooga: University of Tennessee.

Melting glaciers, freshwater, and conservation in the Mt. Everest region of Nepal. In: Straight, S. (ed.). 2010. Written in Water. Washington, DC: National Geographic Society.