

Jangbi and Ura Communities, Bhutan
26 May – 1 June 2014

Event Report

Mountain Communities Workshop on Climate Change and Biocultural Heritage

An International Exchange on Indigenous Knowledge,
Values and Strategies for Adaptation



Author information

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About the event

Bhutan, 26 May – 1 June 2014

Organised by Asociacion ANDES, IIED, ISE Global Coalition for Biocultural Diversity and National Biodiversity Centre (Bhutan)

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Acronyms

ABS	access to genetic resources and benefit sharing
ANDES	Association for Nature and Sustainable Development
BCP	Biocultural Community Protocol
CIP	International Potato Centre
GM	genetically modified
IPCC	Intergovernmental Panel on Climate Change
ISE	International Society for Ethnobiology
masl	metres above sea level
MFAIR	Mountain Farmers Association for Innovation and Resilience
MCI	Mountain Communities Initiative
MLS	Multilateral System
NGO	non-governmental organisation
NRM	natural resource management
PBR	People's Biodiversity Register
PPB	participatory plant breeding
PNG	Papua New Guinea
TEK	traditional ecological knowledge
TK	traditional knowledge

Executive summary

Mountain communities will be the first affected by climate change, and experience the most severe changes as, according to the Intergovernmental Panel on Climate Change (IPCC), the magnitude of climate change impacts increases with altitude. They are also part of the solution: as the 5th IPCC report puts it, 'Indigenous, local, and traditional knowledge systems and practices, including indigenous peoples' holistic view of community and environment, are a major resource for adapting to climate change'.

Mountain Communities Initiative

The Mountain Communities Initiative workshop brought together representatives from 25 indigenous and traditional mountain communities from 10 countries – Bhutan, China, India, Kyrgyzstan, Papua New Guinea, Peru, the Philippines, Taiwan, Tajikistan and Thailand – to exchange knowledge and experience for adapting to climate change. The seven-day workshop was held in two mountain communities in Bhutan, Jangbi in Trongsa District and Ura in Bumthang District. Farmers analysed the climatic changes, impacts and responses in their communities using a common matrix and gave quantitative measures where possible. Discussions were held in farmers' fields, water sources, sacred sites and other important sites in each community, using a 'walking workshop' methodology. Food festivals and cultural exchanges were held in the evenings where seeds, traditional foods, dances and songs were shared by each community.

The workshop found that a number of climatic changes have already occurred in these mountain communities in the last 30 years, bringing many challenges for food production. It highlighted the critical importance of indigenous knowledge, crops and farming systems for coping with extreme events, adapting to a range of conditions and reducing risk. It also highlighted the mutual inter-dependence between traditional knowledge, languages, cultural values, crop diversity and mountain ecosystems.

Impacts of climate change

All the communities represented reported abnormal weather patterns in recent years, over half reported more extreme weather and higher temperatures or temperature extremes. Almost all (21 out of 25) reported reduced water in springs and water sources, and these changes were considerable in many cases (for example over 50 per cent reduction in water levels in the eastern Himalayas, most springs drying up in the central Himalayas and a 4-year drought in Yunnan in southwest China). In most cases this was due to reduced rainfall, but a few communities attributed it to changes in glaciers: largely melting, for example in Peru, but expanding in one community in Tajikistan. Many communities also reported changes in rainfall patterns and more erratic rainfall, affecting crop production (for example too much rain at certain times and too little rain at others). In Taiwan they have begun to experience very heavy rain even outside the typhoon season. Typhoons have become more severe in Taiwan and the Philippines, and these and other communities reported increased flooding.

Over half the communities (about 60 per cent) reported higher incidences of pests and diseases which are thought to be related to changes in climate, notably increased temperatures. Increased soil erosion and soil quality decline due to changes in climate (such as heavier rain and dryer weather) and use of chemical fertilisers, were also reported by over half the communities. A number of communities reported a loss of crop diversity related to climate change and other factors, leading to reduced options for adaptation.

Harnessing traditional knowledge, crops and practices

Traditional knowledge and local crops, traditional institutions that promote the sharing of knowledge, customary laws for resource management, and combining traditional knowledge with science were seen as critical to communities' capacity to adapt. In Tajikistan, for example, the solution to reduced water availability is to grow local varieties which are already adapted because the climate has changed in previous times, while tackling increased pests requires both science and traditional knowledge and local crop diversity to find more resistant varieties. In Taiwan, a system where elders meet is revitalising traditional knowledge for coping with typhoons, while a labour-sharing mechanism which promotes the intergenerational transfer of traditional knowledge plays an important role in enabling communities to resist the impacts of heavy rain (such as soil erosion).

In southwest China and the Potato Park, Peru, communities are using customary laws to manage water in times of scarcity/drought. In both areas, collaboration with scientists has proved important. Participatory plant breeding in China has yielded more resilient maize varieties and conserved and improved many landraces, while in Peru the Potato Park communities have gained over 400 native potato varieties from the International Potato Centre. A number of communities also stressed the importance of establishing community seed banks, and exchanging seeds with other communities, and some have domesticated wild foods in response to pests or reduced productivity. Responses to water shortages also include the use of improved composting techniques to enhance soil moisture, and switching to crops which need less water such as maize instead of rice.

Traditional farming practices were identified as important responses in a number of cases. For example, in the eastern and central Himalayas, crop rotation and intercropping mitigate against the risk of crop loss. In Guangxi, southwest China, duck-in-rice systems have been re-introduced for pest control and a farmer co-operative has been formed, allowing farmers to tap into higher value organic markets. In Taiwan, women are trying to revitalise traditional farming systems following the disastrous Typhoon Morakot in 2009. In one community, however, (the Monpa, Arunachal Pradesh, northeast India), farmers were previously unable to produce good apples due to changes in climate and they now use hybrid seed 'which is much better'. In the Philippines, the community of Higaonon has adopted irrigation, hybrid seed and fertilisers because the traditional rice farming system was no longer viable due to climatic changes, but they now get a lot of pests and need to use expensive pesticides, so they may have to go back to traditional farming.

All the communities stressed the importance of maintaining traditional cultural values and languages in order to sustain traditional knowledge for adaptation. 'We need to rebuild our spirituality to respond to these challenges and promote the sharing of traditional knowledge.'

(Taiwanese elder). Traditional language is the most important mechanism for transmitting traditional knowledge, containing knowledge that cannot be captured in English, but is being lost fast. Strategies to revive language include strengthening traditional institutions, informal schooling on weekends, linking elders and youth, integration in school and university curricula and documentation. Language and knowledge transmission also needs to happen outside the classroom, however – 'If we have a rich forest and forest foods and natural resources, we can transfer traditional knowledge to the younger generation' (Thai Karen).

Maintaining traditional knowledge ensures that traditional seeds are preserved because it requires farmers to continue to plant these seeds, even if alongside modern farming systems.

'We need to rebuild our spirituality to respond to these challenges and promote the sharing of traditional knowledge.'
(Taiwanese elder)

Building policy support

While governments are supporting community adaptation efforts in some cases, for example providing crop insurance for farmers in Bhutan, communities generally receive very little support, and some government interventions have made the problems worse. In Taiwan, the top-down policy of relocating mountain communities to lower altitudes has decreased community cohesion and led to suicides, drug addiction and loss of cultural identity. Environmentally unsustainable development in the central Himalayas (India) is thought to have exacerbated the impacts of climate change on communities. Indigenous communities need far more support from governments to revitalise traditional knowledge and languages, recognise their role and rights as natural resource managers, and sustain their traditional/organic farming systems for adaptation. Governments should also recognise that the farming systems and ways of living of mountain peoples have the potential to reduce greenhouse gas emissions. A study of the Karen community in Thailand found that rotational farming can work as a mitigation strategy through the reduction of greenhouse gas emissions and carbon storage in higher fertility soil and community forests.

The International Network of Mountain Indigenous People and the Bhutan Declaration

As a result of the workshop, the communities formed the International Network of Mountain Indigenous Peoples in order to exchange knowledge and seeds for climate change adaptation and food sovereignty, and to advocate for the protection of community biocultural heritage rights. Upon its formation, the network produced the *Bhutan Declaration on Climate Change and Mountain Indigenous Peoples*. Among other things, the Declaration calls on governments and others to support traditional knowledge and indigenous languages and recognise the role of traditional farming systems in adapting to climate change. It calls for greater cross-cultural exchanges of both knowledge and seeds amongst mountain communities, and the repatriation of seeds from gene banks, to create more options for adaptation and ensure local and global food security. It also notes that mountain indigenous peoples have been marginalised from the development of policies and plans for adaptation, and calls for the integration of traditional knowledge into sectoral policies, plans and programs at national level.



MCI workshop participants outside the temple in Ura. Frederik van Oudenhoven.

Introduction and objectives

Global changes, most notably climate change, threaten mountain ecosystems and the people that depend on them for their livelihoods. The Intergovernmental Panel on Climate Change (IPCC) states that the magnitude of climate change impacts increases with altitude – hence mountain ecosystems will be the first to be affected and will experience the most severe changes over time. However, mountains also sustain traditional farming systems which are rich in genetic diversity and indigenous knowledge for adaptation. According to the 5th IPCC report: ‘Indigenous, local, and traditional knowledge systems and practices, including indigenous peoples’ holistic view of community and environment, are a major resource for adapting to climate change, but these have not been used consistently in existing adaptation efforts. Integrating such forms of knowledge with existing practices increases the effectiveness of adaptation.’¹

From 26 May to 1 June 2014, representatives from 25 remote indigenous and traditional mountain communities in 10 different countries, speaking 22 languages, met in Bhutan to exchange knowledge about the impacts of climate change and the adaptation responses needed. The Mountain Communities Initiative (MCI) workshop sought to enhance the capacity of communities to adapt to climate change and sustain resilient food and farming systems by learning from experiences elsewhere, sharing solutions and exploring the possibility of establishing an international network. More than 70 farmers and local organisations took part. They came from Bhutan, China, India, Kyrgyzstan, Papua New Guinea, Peru, the Philippines, Taiwan, Tajikistan and Thailand, and included elders, women and young people (along with researchers, translators and two film crews).

The farmers reported a number of climatic changes and impacts in their communities in the last 30 years: rising temperatures, increasing pests and disease, melting glaciers, and shifts in the altitudinal ranges of crops. Erratic rainfall has significantly reduced the water available for irrigation and drinking and extreme events such as drought and typhoons have become more severe and more frequent. Many of the adaptation responses and solutions identified are based on indigenous knowledge of how to cope with more extreme weather, traditional crop varieties adapted to a range of conditions, and traditional farming practices that reduce risk and conserve the natural resource base. While solutions like high-tech seeds may be effective in increasing productivity in the short term, some farmers noted a decline in productivity after one or two years of using chemical inputs. When the climate changes again, communities may have nothing to fall back on if new technologies are allowed to replace their own knowledge and seeds which are attuned to local environments. However, the adaptive capacity of many mountain communities is being weakened by the loss of local crop diversity and traditional knowledge, and the erosion of cultural and spiritual values that ensure their maintenance.

The seven-day workshop was organised just prior to the 14th Congress of the International Society for Ethnobiology (ISE) held in Bhutan, under the auspices of the ISE’s Global Coalition for Biocultural Diversity, as a way to benefit the host communities of Bhutan. It was held in the joined communities of Jangbi and Wangling in Trongsa District, and the Ura community in Bumthang District. It used a ‘walking workshop’ methodology, where discussions were held in and around farmers’ fields, water sources, sacred sites and other important sites in each community. Food festivals and cultural exchanges were held in the evenings involving the preparation of local dishes by each community and sharing of traditional dances and songs and short films of each community. The workshop was designed and chaired by Alejandro Argumedo of the Association for Nature and Sustainable Development (ANDES), Peru. Participating communities were invited through the ISE, The Christensen Fund, IIED’s Smallholder Innovation for Resilience project (SIFOR) and the United Nations Development Programme (UNDP). They included a Monpa indigenous community from northeast India to enable exchange with the Jangbi Monpa community in Bhutan.

¹ IPCC. 2014. Summary for policymakers. In: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects*. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1-32. http://ipcc-wg2.gov/AR5/images/uploads/WG2AR5_SPM_FINAL.pdf.



MCI participants at ISE Congress opening ceremony. Ajay Rastogi.

Prior to the MCI workshop in Bhutan, a preparatory learning exchange was held in the Potato Park, Peru, involving farmers from the two MCI host communities in Bhutan and from Yunnan in China. The goal was to enable the farmers to learn from the Potato Park's biocultural strategies for adaptation, and ensure that the MCI workshop was not just one-off event but a more meaningful dialogue. The farmers from Bhutan, China and Peru agreed to exchange seeds to increase the chances of producing food in the face of climate change, and the International Potato Centre in Lima agreed to assist with the seed exchange.

As a result of the MCI workshop, an International Network of Mountain Indigenous Peoples has been created in order to exchange knowledge and seeds for climate change adaptation and food sovereignty, and to advocate for the protection of community biocultural heritage rights.² Upon its formation, the network produced the *Bhutan Declaration on Climate Change and Mountain Indigenous Peoples* (see Annex 1). The declaration calls on governments and others to, *inter alia*:

- Support traditional knowledge-based adaptation strategies, respect the worldviews and cultural and spiritual values of indigenous peoples and traditional farmers, and promote indigenous languages as living libraries of traditional knowledge.
- Recognise the value of traditional farming systems to national food security, and support processes for bridging traditional knowledge and science to create effective solutions for agrobiodiversity conservation, food security and climate change adaptation.
- Support cross-cultural exchanges of knowledge, innovations and technologies amongst indigenous mountain communities to enable them to find appropriate and effective adaptation solutions.
- Support seed exchanges between communities and the repatriation of seeds from gene banks to create more options for adaptation and ensure local and global food security.

² 'Biocultural heritage' comprises the interlinked and interdependent knowledge, biodiversity, landscapes, cultural and spiritual values and customary laws of indigenous peoples and local communities. See www.bioculturalheritage.org.

Preparatory learning exchange in the Potato Park, 24-30 April 2014

Leading up to the Mountain Community Initiative workshop in Bhutan, a preparatory learning exchange was held in the Potato Park near Cusco in Peru. This exchange brought together Monpa and Urap peoples from Bhutan and Naxi peoples from the Meiquan and Stone Village of Lijiang, southwest China, and Quechua and Q'ero peoples from the Andes. ANDES and the Potato Park co-organised this south-south exchange based on their previous experience of a contact learning zone approach, where historically and geographically separated peoples come together in democratic spaces for horizontal learning. The shared colonial history of many indigenous peoples has created legacies of coercion, inequality and conflict, which the contact learning zone attempts to overcome using principles of sharing, solidarity, participatory knowledge discovery, co-operative management of knowledge and fostering interdependent horizontal networking.

The exchange began with an introduction to the Andean biocultural heritage, agricultural system, and the impacts of climate change and adaptation through a walking workshop through key biocultural heritage sites in the region. In Písaq, participants considered the threats and vulnerability to climate change and in Moray, they saw evidence of the incredible adaptive capacity of Andean farmers who have cultivated crops such as the potato for thousands of years.

The participants in the exchange were also able to learn from the experience of the Potato Park, which has become an emblematic example of implementing a Biocultural Heritage Territory. The park provides an example of how local participation and control of development processes can achieve sustainable rural livelihoods, resilience, environmental sustainability and indigenous self-determination. The joint territory of this association of five communities demonstrates that biocultural heritage-based approaches can provide for innovative sustainable development models by giving the territory an economic value based on the particularities of its biocultural diversity.

The threat posed by climate change and the resilience of Andean farming systems were further explored at an important high mountain lake and a research centre focused on seed diversity in the Potato Park.



Farmers and scientists from Bhutan and China learn about Andean biocultural heritage. Adam Kerby.

The participants also learned of the park's successful integration of product development (vertical integration) and territorial development (horizontal integration) with different rural sectors (for example handicrafts, gastronomy, agriculture, natural products). The farmers discussed the guiding principles of Andean cosmovision, including concepts such as *sumaq kausay*, roughly translated as *buen vivir* or 'good living', an indigenous concept of wellbeing, and *ayllu*, a holistic concept of community integrating three interconnected realms representing the human, wild and sacred elements. Diversity and reciprocity and other spiritual and cultural values were also explored in relation to agriculture and adaptive capacity. The participants were also introduced to how community innovations based on indigenous knowledge and science can be harnessed in a way that recognises the role of women and traditional knowledge experts. The Potato Park's work on climate change adaptation, which bridges traditional knowledge and science, was used as an example of community ecosystem-based adaptation.

A key discussion point in the exchange was the importance of policy supporting indigenous peoples and farmers' responses and adaptation to climate change. The participants travelled to Lima to meet representatives of the International Potato Centre where they shared ideas on the storage of genetic resources and exchange of germplasm between the farming communities, and Peru's National Institute of Agricultural Innovation, to discuss the implementation of agrobiodiversity conservation areas.

The experience of this initial exchange among the MCI participants resulted in an agreement to engage in a long-term partnership to share indigenous crop varieties and knowledge about how to grow them in different climates and landscapes. This co-operation is a crucial step in their efforts to maintain resilient biodiverse food systems, seed security and food sovereignty. According to Alejandro Argumedo, 'this partnership represents a unique alliance forged by indigenous peoples to overcome the threats to agriculture and food security in a changing climate. It also promotes the realisation of Farmers' Rights and strengthens the important links between agrobiodiversity, cultural heritage and sustainable development'. This part of the exchange marked a critical first step in the global partnership that would continue in Bhutan in May.

'this partnership represents a unique alliance forged by indigenous peoples to overcome the threats to agriculture and food security in a changing climate'

Methodology for the walking workshop

The Mountain Communities Initiative used an innovative 'walking workshop' methodology. The idea of the walking workshop is to stimulate discussion on key topics by visiting the relevant community sites – fields, forests, water sources, temples – and to learn first hand by seeing and experiencing these and interacting with different experts from the community. They were held in two contrasting communities – Jangbi, in a remote sub-tropical forest area at 1200-1500 metres above sea level (masl) and Ura, a more developed community in a temperate forest area at 3200 masl. The walking workshops entailed:

- Discussions held in the community meeting place in Jangbi (a semi-open roundhouse) and then in Ura (the temple) to identify climatic changes and impacts and adaptation responses. The aim was to enable the communities to get to know each others' situation, identify common challenges and share solutions.
- A visit to the temple in Jangbi – prayers were said in the temple by a representative from each community in their own language. This was followed by an explanation of what had been said, which provided the basis for a discussion on cultural and spiritual values and how they relate to adaptation. Having this discussion early in the agenda helped to unite and engage people in the process and led to a very dynamic discussion on the importance of language for sustaining traditional knowledge (TK).
- Visits to fields, water sources and other important sites in Ura, as identified by the community – at each site, local people explained what they planted/made and the challenges faced, and farmers from other communities asked questions, discussed issues and shared their own knowledge related to the site.

- Food and cultural festivals in the evenings – the farmers brought dried foods and seeds to share, and brought food from their communities which they used to cook traditional dishes for the host community and others. The host communities and visitors shared traditional songs and dances. Visiting communities brought films of their communities (shown using a solar-powered projector). These festivals were repeated in both the Jangbi and Ura communities and formed an important part of the learning and exchange process.

The workshop involved discussions within community and country groups as well as in plenary and in thematic groups. A co-ordinator was appointed from each country to liaise between the workshop chair and the country teams and act as the spokesperson/translator for their group (often these were researchers working with the communities).



Farmers from Thailand and Peru cooking and Jangbi community observing. Frederik van Oudenhoven.



Farmers from Thailand and China serving food to Jangbi community. Krystyna Swiderska.

Walking workshop 1: Jangbi Community, Trongsa District (27-30 May)

1. Climatic changes and adaptation responses in each community

This first session was designed to enable the communities to understand each other's farming systems and the climate change challenges facing each community, and how they are responding. Discussions were first held in community or country groups to enable the communities to reflect on the issues before presenting them to all the participants. A list of the climate-related threats faced by the Potato Park was circulated to each group to prompt reflection. A common matrix was developed to focus the discussion on specific issues related to the impacts of climate change on farming systems, the community's existing capacity to adapt, and solutions to the problems (see Table 1). The farmers were asked to provide quantitative responses on the climatic changes observed during the last 10-30 years, using measurements of their choice (rather than only talking in general terms). The points that follow represent the reports of the community or country working groups to the plenary session.

Table 1. Climate change impact and response matrix

	Changes in the last 10-30 years (threats)	Impacts of the changes	Capacity to adapt	Solutions
Glaciers and water				
Temperature and rainfall				
Pests and diseases				
Soils				
Seeds and biodiversity				



View of Jangbi community and meeting room. Frederik van Oudenhoven.

Tajikistan – Rasht Valley and Wakhan Valley; and Kyrgyzstan

Community context

- *Tajikistan*: The Jafr community of the Rasht Valley has its own botanical garden in a wetland, with 48 apple varieties and 22 varieties of pear. It extends up to 1800 metres above sea level. The Wakhi people of Tugoz village in Ishkashim District speak Wakhi, and the same ethnic group is found across four countries. Tugoz is situated at 2500-3000 masl and grows wheat, barley, pulses and potato.
- *Kyrgyzstan*: The glacier is melting due to gold mining. The Kochkor community (Naryn oblast) has potato production, sheep, horses, yaks and cattle. In the Talas oblast they used to grow tobacco but now they grow potato and soya. Apricots are grown in Batken oblast.

Climatic changes and impacts, capacity to adapt, and solutions

- *Glaciers and water*: In some parts of Tajikistan, glaciers are disappearing, especially Fedchenko which is disappearing very fast. But another glacier is growing due to more snow and colder winters, and this has decreased water resources in rivers and springs, creating problems for irrigation in hot summer periods. The solution is to grow local varieties and fruit crops. Because they are local varieties, they are already adapted to climate change, for example reduced water, because the climate has changed in previous times.
- *Rainfall* has decreased and therefore water resources have also decreased. They have lost a lot of water in Tajikistan and Kyrgyzstan because of climatic changes, and demand for water is increasing. The weather is more unpredictable and there are more extreme events in Tajikistan and Kyrgyzstan. There was a late spring frost this year in the north of Kyrgyzstan. In Kochkor community or Naryn province, it snowed on the 23rd of May, which is thought to have never happened before. In April it was snowing when the fruit crops were blossoming. This is a serious problem as farmers can lose their crop and source of income. In response, the farmers put snow in the roots to get fruit crops to blossom later – this is traditional knowledge and practice in both countries.
- *Pests and diseases* are one of their biggest problems. There are more pests and diseases than in the past. New kinds of pests and diseases have appeared, for example due to the introduction of varieties from abroad. They get a lot of pests and diseases when they have a rainy year or a dry year. The solution is to conduct training using both science and traditional knowledge, facilitate exchanges of experiences, and use crop diversity to find more resistant varieties.
- *Seeds and biodiversity*: there are many local crop varieties but these are disappearing because of people/anthropological, socio-economic and political factors. The solution is to establish community seed banks and on-farm conservation initiatives, as well as training and information sharing.



Farmer from Tajikistan with fruits and nuts at food festival in Jangbi. Frederik van Oudenhoven.

Taiwan – Tayal, Kanakanavu and Pangcah

Community context

Both the Tayal and Kanakanavu are indigenous forest communities. The Tayal are Taiwan's third largest tribe, located in north central Taiwan, with a population of about 85,000 people. The Kanakanavu people are located in Southern Taiwan, at an altitude of 800 – 2000 metres above sea level, and comprise about 500 people. Taiwan is very industrialised and therefore its indigenous people grow cash crops. The two tribes are very influenced by the economic mainstream but still grow some traditional crops like millets, sweet potato and cassava. The Pangcah, the largest tribe in Taiwan, are coastal people located in Eastern Taiwan and have an average population of 190,000 people.



Taiwanese elder and Jangbi community leader outside the meeting room, Jangbi. Frederik van Oudenhoven.

Climatic changes and impacts

They used to have typhoons every year but recently they have begun to experience very heavy rains not necessarily in the typhoon season. In 2009, there was a very serious typhoon in Southern Taiwan where the Kanakanavu people are located – over 3 metres of rain in 3 days. The community agricultural land area is decreasing because of soil erosion resulting from very heavy rain and other factors. Government policy in response to these issues has alienated the participation of indigenous people and caused even more problems for the communities. A number of communities have had to relocate to lower altitudes because the government has coerced them to. This is leading to many problems – resettlement in the new environment has led to decreased community cohesion, suicides amongst the old, and drug addiction. They are losing their identity which is linked to the mountains and traditional villages. Relocation has caused problems for women as they have more responsibility for maintaining the home. The Tayal people have a similar situation and problems, but to a different extent.

Capacity for adaptation and solutions

- The communities have some capacity for adaptation – for example a system is in place where the elders get together, revitalising traditional knowledge for coping with typhoons.
- The Tayal have a 'giyu' or 'spazious' which is a social labour mechanism. This promotes mutual learning and young people go to older farmers to learn. It is a traditional mechanism and plays an important role in enabling communities to resist the impacts of heavy rain.
- The farming system is increasingly linked to women – since the disaster of the Morakot typhoon in 2009, women have been trying to revitalise traditional farming systems and crops.
- 'We need to rebuild our spirituality to respond to these challenges and promote sharing of local knowledge. The power of resilience relies in the local knowledge of tribal people.'
- The inadequate government policy of relocation needs to be addressed by creating an advocacy strategy.

Thailand – Pgakenyau Hinladnai community (Karen)

Community context

There are about half a million Karen, mainly in northern Thailand. The community of Hinladnai, which is composed of three hamlets (Hin Lad Nai) is at 800-900 metres above sea level in an evergreen forest. In 1989, the village started work to conserve the forest based on traditional knowledge, after it had been almost destroyed by a logging concession granted without any community consultation, which resulted in increasingly frequent outbreaks of wild fires. During the last 30 years, they managed to regenerate 80 per cent of their forest which had been logged, while maintaining their rotational farming system and developing high-value products to create a cash income from the flourishing forest. In 1992, the government tried to turn the area into a national park and resettle the communities but the communities were able to resist this by forming a network to fight for their land rights (the Northern Farmers Network) and by showing their forest conservation achievements.



Thai youth and Philippines elder, Ura community. Frederik van Oudenhoven.

Climatic changes and adaptation responses

In 2010, weather conditions were very warm, with an abnormally long dry season. The rain came very late, and then there was very little of it. This had a serious impact on many people, particularly upland farmers whose subsistence systems relied on terraced paddy fields and rotational farming. The shortage of water meant that only small areas of terraced paddy fields could be planted, and even then, yields were very low. Some paddy fields were abandoned because of the lack of water, and people whose livelihoods were based on wet-rice farming, rather than rotational farming, had to suddenly sell their labour to earn cash. Surprisingly, during the long dry period between May and July or August in 2010, swiddens still produced almost normally, suggesting that rotational farming is better able to cope with abnormally dry weather than paddy fields. Nevertheless, yields from swiddens were still lower than normal, and a serious consequence was a decrease in plant and seed varieties because not all species were capable of growing and maturing in the high temperatures. Some failed to germinate or were taken by birds or insects during the long wait in the ground for vital moisture. The upland ecosystem suffered badly in late 2010 because of uncontrolled fires sweeping through the tinder-dry forests. Even farmers who normally controlled their swidden fires rigidly found they were unable to contain the flames.

The following year, the weather moved to the opposite extreme, with too much rain, particularly in March-May when upland farmers were trying to burn and clear swiddens for rotational farming. Rainwater from the northern highlands of Thailand began a torrent that swept south to create the country's worst floods in living memory. Paddy yields doubled and the abnormally wet conditions brought a great diversity of plants and seeds, but the farmers' biggest problem was burning their fields in the damp conditions.

There has been a lot of flooding in the last few years. When they have too much rain, people do certain things to adapt their agriculture practices, for example they don't just collect the dry leaves but also the wet leaves and flowers, and they have to change the planting times, so they try and use natural indicators for the agricultural calendar. If they have fallow land, they try to collect seed and plant it so they can use the land, and planting rice paddies from top to bottom or bottom to top has changed.

Adaptation solutions

- Shifting cultivation is not recognised by the government, but the process of natural resource management by the community has led to some recognition of community farming practices and resource rights.
- 'If communities have a rich forest and forest foods and natural resources, they can transfer traditional knowledge to the younger generation.'
- In 2010, a study supported by the Northern Development Foundation and Oxfam GB, found that rotational farming can work as a mitigation strategy through the reduction of greenhouse gas emissions and carbon storage in higher fertility soil and community forests.³
- Mountain peoples are not the cause of climate change, their farming systems and ways of living have the potential to reduce greenhouse gas emissions.

'If communities have a rich forest and forest foods and natural resources, they can transfer traditional knowledge to the younger generation.'

'Mountain peoples are not the cause of climate change, their farming systems and ways of living have the potential to reduce greenhouse gas emissions'

³ Northern Development Foundation. 2011. *Climate Change, Trees and Livelihood: A case study on the carbon footprint of a Karen community in Northern Thailand*. Northern Development Foundation. <http://unfccc.int/resource/docs/2012/smsn/ngo/240.pdf> .

Bhutan – Jangbi and Ura communities

Community context

Jangbi is a very remote community in Trongsa District, located in a national park at about 1300 metres above sea level, in a hilly sub-tropical forest with pine. Ura is located in Bumthang District, at about 3200 masl, in a temperate forest area with conifers, also a national park. It is one of the more politically influential communities in Bhutan. The Monpa indigenous communities have adopted the Buddhist religion as their main faith fairly recently, unlike most other ethnic groups in Bhutan, and are more marginalised. The Ura community mainly grows potatoes for export to India and is more economically developed.

Climatic changes and adaptation responses

- *Water:* Jangbi faces problems due to reduced water in its springs. This is mainly attributed to climate change. Water comes from the mountains and due to reduced volume in the river, there is less water for drinking and irrigation. The same problems are experienced in Ura – the solution is watershed management. In Ura, the communities are managing the water catchment and forest. The people believe in their traditional knowledge, so they give offerings to local deities and perform religious rituals to get rain during droughts.
- *Temperature and rainfall:* in Ura in the past few years they have not had good snowfall in winter. Because of erratic rainfall and reduced water, there have been changes in soil quality because it has become more dry. The temperature has also increased. To combat these changes in rainfall and temperature, the communities make offering to local deities.
- *Pest and diseases:* in Jangbi, an army worm infestation of all their crops and forest foods resulted in a very bad famine. In Ura, they had problems with caterpillars which affected their crops. In both cases, the pests and diseases are thought to be related to changes in climate in recent years, notably abnormal and warmer spring weather. Problems with wild boar raiding crops also affect both communities. The solution is crop insurance for pests, and fences for wild boars.
- *Seeds and biodiversity:* both communities practise traditional farming using local seeds, but the Department of Agriculture supplies modern seeds, and Ura grows commercial potato varieties.
- *Soil fertility* has declined due to erratic rainfall and limited water, and also due to the use of chemical fertilisers – in the first few years this may be more productive but then the soil fertility decreases.

India – Salari Monpa community, Arunachal Pradesh

Community context

Salari is a Sartang Monpa community in Dirang Subdivision, West Kameng District in Arunachal Pradesh, northeast India. It is in an area of sub-temperate to alpine forest ranging from 2500 -3500 metres above sea level. It has a community-owned forest but much deforestation is occurring. The main crops are maize, potatoes, barley, wheat and rice; wild sago palm (*rangbang*), a traditional crop, is eaten usually during famine. The main cash crops are kiwi fruit, apples and potatoes. They also depend on cattle for their livelihood and basic needs. The area still has very rich biodiversity and medicinal plants.

Climatic changes and adaptation responses

- Many original sources of water have dried up. Rainfall used to be from June to August but now they only get two months of rainfall most years. Because they have to wait for the rain, and therefore sow the seeds late, the quality of their produce has declined.
- Due to the delay in rainfall, the maize got infested with pests so they adopted wheat and millet instead. Their cattle got a serious foot and mouth infection, so they use rituals and traditional

knowledge to address this. Due to reduced rainfall and water, soil quality has also declined. If the field does not produce, it is left fallow for two or three years, and manure is used instead of fertiliser.

- A local palm extract is now consumed to make up for the reduced food production.
- Due to the changes in climate, apple farmers could not produce good apples in the region, but the Department of Horticulture has provided hybrid seed which is better.

India – traditional communities near Ranikhet, Uttarakhand, Central Himalayas

Community context

These traditional rural communities are located in the Talla Sari valley of Govindpur in Almora District, at 1300-1500 metres above sea level, in a forest landscape with pine trees (similar to Jangbi). The elderly woman farmer from Galli Basyura village is the head of a forest committee. Women in these communities do not normally participate in decision making, so it is remarkable that a woman has been nominated as the head of the forest committee. The elderly male farmer has done a lot of experimentation and has bred an improved radish variety by cross-breeding a traditional variety with a hybrid variety.



Radish breeder from the central Himalayas exchanging seeds with farmers from China. Ajay Rastogi.

Climatic changes and adaptation responses

- *Water* levels have gone down by 30-40 per cent, and almost all natural springs have dried up or are very low. This has affected agricultural productivity and reduced the availability of drinking water. The following coping mechanism are used: improved composting techniques which improve soil moisture, growing crops which need less water such as cardamom and apples, and mixing loamy and clay soil to increase water retention.
- *Temperature* has gone up by as much as 20-30 per cent and winters have got milder. The forest has become dryer and has degraded over the past few years especially where pine trees dominate the forest (they leave the soil dry). This is thought to be contributing to increased human-wildlife conflicts (wild boars) as well as increased incidents of forest fires.

- *Rainfall* patterns have changed significantly and become more erratic – sometimes it rains when they don't need it and there is no rain when they do need it. There has been an increase in extreme events, including serious flooding.
- *Pest and diseases* have increased due to the irregularity of snowfall, reduced rainfall and because of the use of pesticides elsewhere. Soil erosion is very high – about 20-30 per cent of the soil has been lost as a consequence of flooding.
- *Biodiversity* is very high in crops and forests – 35-37 different crops are grown each year, or 47-50 crops including the different varieties. But biodiversity is declining. Erratic rainfall has destroyed many seeds because rainfall has come at times when it is not needed. Solutions include strengthening festivals to exchange seeds and developing community seed banks. The government should promote community seed banks. People are more dependent on markets for seed because of the loss of local seeds.

Government development policies and programmes such as dams are making these climate-related problems worse. The government should take into account the fact that there is increased flooding and that it is a very ecologically fragile area before building roads or dams etc. The impact of climate change is greater because policies are not in tune with the environment. Uttarakhand has declared itself the first organic state in India. It has promoted organic farming and inputs through some programmes, but has also promoted the use of chemical fertilisers and pesticides especially through some international and government programmes. It does not pay enough attention to promoting bio-pesticides and bio-fertilisers.

India – Lepcha and Limboo communities, Eastern Himalayas

Community context

The communities are situated at 1250-1500 metres above sea level, in mostly temperate and sub-tropical forest, near Kalimpong in Darjeeling, West Bengal (near southwest Bhutan). The farming system is terrace or mountain farming, mixed cropping and intercropping, with maize, rice, millet and large cardamom as the main crops, and cows, pigs and goats as the livestock.

Climatic changes, impacts and adaptation responses

- *Water and rainfall*: the communities depend on spring water, but the water level has gone down tremendously, by 50-60 per cent. Rainfall has decreased and rainfall patterns are not good for our crops. Because there is not enough rainfall in June-July (this rain traditionally called '*sawnejari*'), there is not enough edible fern ('*nigroo*') to eat; and because the rainfall is not happening on time in September-October (traditionally called '*sisne jari*'), the flowers of another plant are no longer available for eating. In the Lepcha area, the change in rainfall patterns has changed the pattern of agriculture completely, and this is believed to be due to climate change.
- *Pest and diseases*: many new pests, diseases/viruses have been observed. They used to plant big cardamom in the forest and most of the plants were affected by a virus in the forest, so they domesticated this cardamom variety and it has become the community's main commercial crop. They now have good traditional knowledge about cardamom, linked to cultural values and customary laws. Crop rotation and intercropping with other crops also mitigates against the risk of crop loss due to changes in climate.
- *Seeds*: another village used to grow potatoes and were the main suppliers of seed to the community, but the area became reserve forest so they relocated. So now they depend on the market for seed, but they also exchange seed potatoes and other crop seeds with other communities.

Solutions

- The communities have adopted cropping mechanisms which need less water and shade such as the big cardamom variety Varlang, the domesticated forest product called '*nakima*' (*Tupistra nutans*), and dry paddy cultivation which the Lepcha village (Tendrabong) has adopted through exchange of seeds and seedlings with the Limboo village (Pabringtar). They have also domesticated a forest product called '*kucho*'.
- They have established a community seed bank, so they can exchange seeds. The seed bank lends seeds to farmers and farmers have to return twice the amount borrowed. They have strong institutional organisations – a three-tiered traditional system of organisation, and they exchange ideas, culture etc. The Limboo have traditional institutions and they also have village-level meetings each month where they exchange seed, talk about climate change challenges, and innovate. They have established a Mountain Farmers' Association for Innovation and Resilience (MFAIR) to exchange seeds and knowledge amongst the communities and learn through exposure visits.
- They have traditional names for the different types of rain – a rich taxonomy which scientists don't have. This traditional taxonomy allows them to be more precise in monitoring the changes that are happening.

Papua New Guinea

Community context

Papua New Guinea (PNG) has 850 different tribes and languages, and the largest diversity of sweet potato in the world. It has the third largest forest cover area after Brazil and the Congo and 5 per cent of the world's biodiversity in 1 per cent of the world's land area. Its tropical forest communities are at an altitude of between 0 and over 4500 metres above sea level. Because of the rising sea levels, the low-lying islands and atolls are rapidly disappearing as the shorelines are eroded by the pounding of waves.

Climatic changes, impacts and adaptation responses

- *Water resources*: the country is experiencing extreme temperatures in some parts and extreme rainfall in others. With heavy rain, the soil gets waterlogged and with extreme temperature it gets hard – which is not good for growing crops. The ancestors did not practice irrigation because they relied on the water cycle of the tropical system. These extreme temperatures and rains are something new – so they now need to introduce irrigation, but this requires a lot of work and awareness raising. The solution is to educate people on irrigation.
- *Pest and diseases*: as the temperature increases, diseases from the coast such as malaria are moving up the mountain, but the mountain people have no resistance to malaria so when they get it, it is a disaster.
- *The soil* is losing fertility because extreme heat dries up the topsoil which contains a lot of nutrients and that gets blown off or washed away when it rains, resulting in low soil fertility in the mountains.
- *Seeds and biodiversity*: with the changes in temperature and rainfall, the communities cannot continue farming because they have no irrigation. If the soil is very dry or very wet they cannot grow crops, so they are losing seeds. Mammals and birds from lower altitudes are migrating to higher altitudes and those at higher altitudes are moving higher, so there is a threat of losing biodiversity.



Participants from PNG, Taiwan and Tajikistan at food festival, Jangbi. Krystyna Swiderska.

Solutions

The government has attempted to relocate people affected by rising sea levels to the mainland, however the challenge has been to get the tribes on the mainland to agree to settle these people. There is no established seed bank or germplasm collection which could be used to strengthen local seed systems. Two years ago there was a lot of awareness on the much anticipated *El Niño*, which never happened. During that time, a new species of yam (*Dioscorea sp.*, Dioscoreaceae), locally referred to as the African yam, was introduced. This was quickly adopted and it has become widely distributed and is now a common household root crop. This shows that people can adapt quickly if solutions are available. An effective government-people collaboration is needed to translate research and technology to tangible agricultural development for people to adapt quickly. However, the adoption of new technologies and crops poses the risk that indigenous knowledge and local seed varieties could be lost, and as a result, indigenous communities could lose their identity.

China – Naxi and Zhuang communities, Karst Mountains, Southwest China

Naxi community – climatic changes, responses and solutions

The Naxi ethnic community in the Stone Villages in Lijiang county, Yunnan province, is located at an altitude of 1800 – 2800 metres above sea level. The biggest change it has experienced in recent years is drought – southwest China has had a serious drought for the last four years and Yunnan is the most severely affected province. They use spring irrigation, but about a third of the water sources have disappeared so a third of their terraces cannot be irrigated. As a result, they have had to switch from rice cultivation to maize and other dryland crops. Because of drought and increased temperature, there are higher levels of pests and diseases, so they have to use pesticides on their fields twice now (rather than once as before). Drought has also caused soil erosion. In response to drought, they use customary laws for water management, practice ‘sky worship’ and are planning to build a community water tank.

Crop diversity has decreased a lot in terms of species and varieties – previously, they cultivated many more landraces (local varieties). Now they plant hybrids but they still plant some landraces. They like some landraces a lot but they are not all adapted to climate change – for example, one landrace is not dislodging resistant. So the farmers want to collaborate with scientists to improve their landraces.

The communities also face other changes which are not caused by climate change. A large power station was built and the river was dammed so it rose up by 70 metres. Because of the dam the communities think the temperature increased, and many of the fish died because the river stopped flowing. Migration is another big change – about a quarter of all households have moved out as a livelihood coping strategy, and this has affected agricultural production. There is also migration because the local school was closed down (due to the government's policy of centralisation of school management), so some people have to move to towns to accompany their children to school.

Zhuang people– climatic changes, responses and solutions

The Zhuang people of Nonlv village, Duan county, Guangxi province are at an altitude of 800-1000 metres above sea level. They also have had some drought problems, and unusual and extreme weather. Before they had a distinct summer and winter, but now these seasons are mixed up. The temperature has increased by 2-3°C in the last 10 years. Insects and diseases have increased. To address these challenges, they have brought back the duck-in-rice traditional farming practice which is very effective for pest control, and other communities are also using it. They want to build a water tank to collect water in the non-farming season. They have formed a women's group for organic farming and have registered a farmer co-operative to help them deal with all these challenges. Another solution which has been effective is collaborating with scientists through participatory plant breeding. This has enabled the communities to improve and conserve many landraces and develop more resilient crop varieties.

The Philippines – Higaonon tribe, Mintapod community

Community context

The community is at 1400 metres above sea level and the landscape is mostly forest and mountains (like Jangbi). The production system is a traditional knowledge-based farming and they have adopted some new systems like irrigation. Their major crops are rice, sweet potato, corn and cassava. They have a co-operative working system – if one family opens a farm all the other families work with them. They have secured an ancestral domain land title of over 14,000 hectares, so they are now free to practice traditional governance and knowledge.

Climatic changes and adaptation responses

The traditional farming systems and indigenous rice farming are no longer viable because of climatic changes and calamities, so the community has adopted irrigation, hybrid seeds and fertilisers, but they never forget their old varieties. The traditional seeds are still grown but they cannot be grown abundantly because of the abnormality of the climate since 2000.

- *Water* resources have decreased by about 30 per cent. They have experienced long drought, and water pollution due to floods. So they are implementing an ancestral domain management plan for sustainable development.
- *Rainfall*: in the last 10-20 years, they have experienced abnormal weather – the wet season is wetter and the dry season is dryer – so as a response, they pray. It now rains when it is not meant to. 'We no longer understand the climate, so we have had to change' (Amay, elder). 'The recent typhoon was the most severe one ever, killing 10,000 people'.
- *Pests and diseases*: because of the new type of farming, when they plant hybrid seed, they get a lot of pests, but pesticides are very expensive, so they now have a serious problem.
- *Soil*: because of soil erosion, they get a lower harvest, and because they apply chemical fertilisers, they also get reduced fertility in the soil. So if their capacity to adapt is not so strong, they will go back to traditional systems of farming.

'We no longer understand the climate, so we have had to change' (Amay, elder). 'The recent typhoon was the most severe one ever, killing 10,000 people'

- *Seeds and biodiversity*: their seeds are still preserved and 'because of our traditional knowledge we have to plant our traditional seeds' even if they produce less harvest. In school, they teach both old and new traditions. The government can also help them introduce chicken dung for organic farming.

'because of our traditional knowledge we have to plant our traditional seeds'



Philippines elder performing the 'bird dance', Jangbi. Krystyna Swiderska.

Peru – Quechua communities, the Potato Park

Community context

The five communities of the Potato Park are located near Cusco at 3350 – 4800 metres above sea level, in the Sacred Valley of the Incas. They farm potatoes, other Andean tubers, grains (e.g. quinoa and amaranth) and maize. They use the altitude to decide what to plant – for example, potatoes are grown at the top and corn at a lower altitude. They also have guinea pigs, llamas and grow leafy vegetables. The Potato Park has a population of 1500 people who all speak Quechua.

Climatic changes and impacts

- *Glaciers and water*: the glaciers are disappearing; one glacier has decreased in size by about 25 per cent in the last 20 years and another has decreased by about 10 per cent. "The snow-capped mountains are sacred so we observe the mountains regularly" (Quechua farmer). Many of the smaller glaciers have disappeared completely. In a number of springs, the water levels have gone down, some by 40 per cent.
- *Temperature and rainfall*: temperatures are more extreme – mornings are colder and afternoons are hotter – and there is an increase in extreme events. They get heavier rains, and a few years ago, flooding washed away some communities and bridges. They also get some drought. The weather and rainy season is more unpredictable – for example prolonged rain when it is harvest time which makes potatoes and corn rot (they need sun to harvest).

'The snow-capped mountains are sacred so we observe the mountains regularly' (Quechua farmer)



Quechua farmers sharing food to Jangbi community. Krystyna Swiderska.

- *Pests and diseases*: the warmer days are warming the soil and potatoes don't like it. Pests and diseases have increased in potatoes and other crops. In the last generation there were no worms or fasciola as there are now. One way they are adapting to this is by moving potatoes up in altitude – but they have already reached the top of the mountain.
- *Soil* temperature has increased leading to increased pests. Erosion due to extreme rain washes away the topsoil and it takes a long time for soils to recover at high altitude.
- *Seeds and biodiversity*: in the past they were seeing a decrease in diversity because of government or non-governmental organisations (NGOs) promoting high-yielding varieties. Lino Mamani, curator of the Potato Park potato collection, notes that 'Some farmers tried the high-yielding varieties but they didn't like the taste and the yield decreased in the second and third years, requiring increasing inputs of fertilisers and water'.

'Some farmers tried the high-yielding varieties but they didn't like the taste and the yield decreased in the second and third years, requiring increasing inputs of fertilisers and water'

Adaptation strategies and solutions

- The farmers collect rainwater in ponds and reservoirs, have very old irrigation channels that they still use, and have institutions that regulate water use when there is a shortage. They adapt by planting in different areas, or in different ways.
- Integrating traditional knowledge and science. They have done a lot of research to document traditional practices which help a lot with adaptation. They have gained over 400 native potato varieties from the International Potato Centre (CIP) – their repatriation agreement with the CIP is also a way of securing their rights over these varieties which were collected from the communities in the 1960s but have since been lost. They have also sent their potato collection to the Svalbard Global Seed Vault in Norway for safe keeping. They now grow about 1400 potato varieties in the park.

Working together as a group of communities has enabled them to influence policies. This led to two new regional laws, one against biopiracy and another declaring the Cusco region free of genetically modified (GM) crops. Other regions, including Lima, followed their example, declaring their regions GM-free as

well. Members of the Potato Park, farmers' federations, scientists, environmentalists and food service professionals joined forces to protest against the government's decree which they felt paved the way for GM crops into the country. The widespread backlash led to the resignation of the Minister responsible for the decree and to a new 10-year moratorium on genetically modified organisms for cultivation and breeding, and on any other type of transgenic products, demonstrating the importance of alliances to bring about policy change. Forming alliances with other groups was very important to bring about policy change.

'Forming alliances with other groups was very important to bring about policy change'

2. Cultural and spiritual values and adaptation



Discussion on cultural and spiritual values outside the Temple, Jangbi. Frederik van Oudenhoven.

Prayers were said in the temple in Jangbi village by a representative from each community in their own language. Outside the temple, each representative explained what they had said. This provided the basis for the discussion below on cultural and spiritual values and their role in adaptation to climate change.

- *Jangbi community, Bhutan:* In the past, the Monpa people used to practice Bon worship involving animal sacrifice and they ate a lot of meat, and degraded the forest. Since the 1970s, they have practised Buddhism, and they have stopped slaughtering animals and now their livelihoods have improved. Buddhists believe that if you harm life, you accumulate bad merit, and it will harm you. Shifting cultivation has also stopped due to government regulation, some people feel this is good in a way because when you practise shifting cultivation you destroy life, but others still feel that regulating shifting cultivation is affecting their livelihood.
- *Karen, Thailand:* when a child is born, their umbilical cord is tied around a tree as an offering. We need to transfer this kind of knowledge that will help young people deal with problems facing their communities. 'We have a community seed bank but we also need an "ideas bank" or "traditional knowledge bank".'
- *Monpa, India:* seeing that the Jangbi community has lost their traditional Monpa animist religion has moved me. It is a shame that this has been replaced by Buddhism. Is it not possible for both faiths to co-exist? Women can play an important role in carrying forward these traditional values.

'We have a community seed bank but we also need an "ideas bank" or "traditional knowledge bank".'

- *Papua New Guinea*: even though they adopted Christianity about 100 years ago, there are certain instructions about how to live, including conservation – so now Christianity and traditional values go together. They believe in living in harmony with the environment; that where there is greed there is consequence; and they give offerings to God. The basic values of Christianity are the same as traditional values – e.g. thou shall not steal.
- *Monpa, India*: Buddhists have sacred groves which mean that species are conserved.
- *Traditional farmers, central Himalayas and Lepcha and Limboo, eastern Himalayas, India*: sacred groves are the basis of spiritual beliefs in our area too.
- *Naxi and Zhuang, China*: We have been farming for 5000 years, and we still follow the tradition of 24 farming seasons – so Chinese farmers traditionally respect nature and believe that everything has a spirit. But these beliefs were destroyed during the cultural revolution, so our communities are now revitalising them – in Guangxi they are building an earth temple again, and in the Naxi villages in Yunnan they built a temple in the school.
- *Mintapod community, the Philippines*: community leaders are very important because they know about traditional values, and how to keep the earth in balance. But children are at formal school for 14 years where they are not taught traditional knowledge, so after school they go to the elders and get the knowledge that they need to equip themselves.
- *Potato Park, Peru*: like humans, potatoes also have a spirit and a family and live in communities. Potatoes are sacred – we have learnt that we must take care of the seed because otherwise we will not have enough food.
- *Tajikistan*: when a person spoils water or the land it is very bad and reflects badly on them or their family. God made humans out of the land and the harder you work, the better the harvest. ‘Spirituality gives hope to help us cope with climate change’. Our agricultural calendar is based on spirituality.
- *Taiwan*: following recent economic development, we now need to get closer to the land and rivers and listen to them. But most indigenous communities take core values for granted and younger people think the core values are for older people. So we need to reinterpret our core values.

*‘Spirituality gives hope
to help us cope with
climate change’*

3. Revitalising traditional knowledge and languages for adaptation

- *Monpa, India*: the communities have developed a Biocultural Community Protocol (BCP) for access to genetic resources and benefit sharing, which has done more than help to protect our rights. When we sat down with younger people to identify all the resources and knowledge that we have, the youth learnt about the traditional knowledge. We made an audio BCP, especially focusing on medicinal plants. ‘Languages are dying out and with that traditional knowledge is being lost’ – traditional languages are not spoken at home anymore.
- *Tajikistan*: we have the same problem of language loss in our country. We can only speak our own language at home.
- *Papua New Guinea*: a study on traditional knowledge found that 40 years ago people had to learn TK, it was part of becoming a man. The system of passing knowledge to the younger generation was compulsory and when that system stopped, younger people had much less TK. Now TK levels have really dropped.
- *Potato Park, Peru*: values are embedded in language. We are losing the capacity to adapt to climate change using solutions based on traditional knowledge. How to revitalise TK? We need to strengthen traditional institutions (Alejandro Argumedo).

*‘Languages are dying out
and with that traditional
knowledge is being lost’*

- *Taiwan*: there are several experiences of grassroots movements in Taiwan, for example, the 'tribal classroom' which started in 1971, when people began to be aware of the loss of culture and language and made this a kind of curriculum. Through a combination of modern computers and elders' TK, young people and elders were brought together (as old people don't know how to use computers). Language is the most important thing for transmitting knowledge – not in the classroom, but walking and learning – the whole forest is a classroom. Government policy for learning TK is inadequate, and their knowledge is different (e.g. the government classifies forests differently).
- *Jangbi community, Bhutan*: the community has their own Monpa language but the younger generations are not taking it up – there is a push from schools to leave it out. This is not government policy, but teachers don't value the traditional language, so the community feels that the government should support them. 'We are very worried that our language is dying' (Jangbi community leader).
- *Papua New Guinea*: language preserves identity. It contains knowledge that cannot be captured in English. Anne-Marie Wanamp (University of Goroka) is documenting 1000 languages so that they can be taught to the young people. She suggests that the communities in Bhutan should link up with the Institute of Language and Culture Studies in Bhutan to help them revitalise traditional languages.
- *Karen, Thailand*: the youth in our community are working to revive language – three generations work together and so connect to each other. Young people can go to informal school on week-ends so they still have a close relationship with their communities. There are three ways of using language: speaking, practice and writing. We now focus on speaking and writing but less on practice, i.e. practical use of the knowledge in the language.
- *Kyrgyzstan*: Before, during the USSR, the Russian language was taught in schools and we lost a lot of traditional knowledge. We have established a centre for Biocultural Diversity Centre in Kyrgyz National Agrarian University (Bishkek city) and developed a multi-disciplinary curriculum and now we teach TK related to livestock and agriculture in the university. We also work with school children to teach traditional knowledge. Through festivals we try to make a bridge between elders and the younger generation, such as the Blooming Apricot Festival in Batken province, which showcases a diversity of local products and allows the revival of the biocultural heritage of the Kyrgyz people.
- *Potato Park, Peru*: a diversity of food in the territory can help to recover the traditional knowledge related to food and promote its use in practice (Alejandro Argumedo).
- *Lepcha, India*: The Lepcha language was getting lost, but now the traditional institution teaches our language once a week. Through the *sezoum* (a traditional Lepcha community organisation), we are now conducting meetings in our own language and we have formed the Himalayan Lepcha Development Board which is recognised by the government. Traditional institutions play a key role in promoting traditional knowledge and language. The Limboo are also reviving traditional institutions that bring back language.
- *Tajikistan*: The traditional agricultural calendar in our community has three stones, when the sunlight shines through the stones you can plant a certain number of days later. It tells you exactly when you can plant what and when not to plant, in order to get the best harvest.
- *Potato Park, Peru*: we need to keep the two worlds together – the past with our ancestors and the future. This hat has different symbols that represent life in the community. We need to look at things holistically – we can't talk about one tree when we have a forest. So we have three communities – the wild, the sacred and the human/domesticated, and all three have to live together and cooperate, because that is good living - we call it '*sumaq kausay*'.

'Language is the most important thing for transmitting knowledge – not in the classroom, but walking and learning – the whole forest is a classroom.'

'a diversity of food in the territory can help to recover the traditional knowledge related to food and promote its use in practice' (Alejandro Argumedo)

4. Reflections on the workshop in Jangbi and on establishing a network

Each community was asked to provide a brief evaluation of the last two days – what they learnt or liked best and what could be improved. They were also asked to comment on the possibility of establishing an international network.

- *The Philippines elder*: I thought I was the only person who loves the forest, but when I came to Bhutan, I got the feeling that everyone loves the forest.
- *Potato Park, Peru*: when the prayers in the temple were explained, we found we had so much in common with other communities. We should establish a network.
- *Papua New Guinea*: we have realised that we share many things in common with the other communities – our values and the challenges we face. We have learnt a lot from this meeting. Within our language and its diversity, our knowledge is embedded which can only be understood through our language. We propose that this network should be supported and strengthened so we can learn from the knowledge that is in our languages and better overcome the challenges that we face.
- *Kyrgyzstan*: this meeting has been a very good seed for our network and joint activity. By pushing and pulling trucks in the mud on our way to the Jangbi community we realised and proved that we have power if we come together!
- *Jangbi community leader*: we have learnt that the palm plant used to make the food from Arunachal Pradesh is found here, so I am going to try and cook it here. I am very excited to try planting all the seeds I have been given and I hope they will be a success. I am worried that our culture is going and the youth don't want to learn it, so I want to learn from you all about how to keep your culture alive.



Feedback session outside the meeting room, Jangbi

- Taiwan*: we have witnessed the power of spirituality here – prayers led to rain and then to sun; and also in the temple when we all said prayers together. We saw that some of our group are changing their religion but we still have some common beliefs: caring for the land and for the people and a harmonious relationship between people and the land. This is very heartening for us from Taiwan because of our country's emphasis on the material world. "Language is very important – it would be a pity if there was only one language in the world – each language is a world." Our elders are sources of spirituality, through stories, knowledge or singing.
- Tajikistan*: we are amazed by the nature here. The people here gave us a seed of their culture, and it depends on us now to grow the seed and integrate it in our culture. We have all been living together as a family – we did not feel the borders, and that is the power of biocultural diversity which we now feel more strongly.
- India – central and eastern Himalayas and Arunachal Pradesh*: we are thankful for the exchange with other communities from India. The landscape, ecosystem, trees and weather are all very similar to our home. We all liked the food festival and seeing how the food is cooked by different communities. We have been struck by how some groups are bringing together the elders and young people – this is very important as young people are not learning traditional languages. The women in the group would have liked to interact more with the women of Jangbi.
- Monpa, India*: we have found that the Monpa community in Jangbi has a completely different dress and language. But there is some similarity between our languages and with the Bhutanese language in general, and the food that we eat is similar.
- Naxi and Zhuan, China*: we are most impressed by the richness of the spiritual world of the local people in terms of sharing with us and the harmonious relationship the community has amongst itself and also by the spiritual values expressed during the visit to the temple, because we put too much emphasis on the material world. As a suggestion, we feel that we should help the community get government support to build a road to connect it to the outside world.

'Language is very important – it would be a pity if there was only one language in the world – each language is a world.'

Walking workshop 2: Ura Community, Bumthang District (30 May-1 June)

1. Climatic challenges and responses in the Ura community

The meeting began with a recap of the discussion in Jangbi to bring the new participants from Ura up to speed. A summary of the findings on the climatic changes, impacts of these changes, ability to adapt and solutions identified by each community were presented, covering each key theme: glaciers and water, temperature and rainfall, pests and diseases, soils, and seeds and biodiversity. The key points from the discussion on cultural and spiritual values and the importance of language for traditional knowledge transmission were also relayed. This prompted the Ura community to reflect on its own situation and challenges:

- We have been seeing changes in *temperature*. A long time ago in Bhutan it was very peaceful and there were not many changes in climate like drought. Now snow is melting and there are a lot of landslides. In the highlands, it is our duty to initiate work to respond to these changes because otherwise, the people at lower altitudes will not do it. To confront these challenges, we first need to preserve the forest and ensure that whatever people do is sustainable. So we need to link lowland and mountain people.
- We have also observed changes in *snowfall* – there is more snow in winter or sometimes less and changes in wind patterns. During the summer, we sometimes have less rainfall than before and sometimes more, and potatoes can rot when there is excessive rain.
- Potato farmers have new *pests* and have to buy chemicals because the pests are destroying their crops; they also face risks from human-wildlife conflicts such as crop raiding by wild boars. Perhaps wild boars don't find enough food in the forest, so they have to come out to the fields, because they are affected by changes in the forest.
- Once children are sent to school it is very hard to make them work in the field, so fewer people are staying in the communities to work on the farms, and this is resulting in a decline in our cultural values and traditional practices. Finding markets for potatoes is also a challenge.

Karen, Thailand: people now get healthcare and food from outside the community so it is very important that parents teach their children about health and food beliefs which are closer to the local context.

2. Walk through the Ura Community and visit to important sites

The workshop participants walked through the Ura village and visited potato fields, sacred sites, a water mill and pasture. They asked many questions which were addressed by the relevant local community experts at each site. The discussion is summarised below.

Walk through the village

- The houses traditionally have wooden roofs, but one roof uses about six trees, so they started to use tin roofing in the 1990s to preserve the trees. While in other communities, concrete may be used these days, this is not the case in Ura – the houses are made of mud walls, stone and wood.
- The water in the well is for drinking – it was used when the village was formed, the village was established around the well. The well is no longer used for drinking water, but is still used to make offerings.
- The farmers in Ura have owned their land since ancestral times – it is legally registered, and is divided up for their children.

- The villagers make *ara*, an alcoholic drink – they boil wheat and ferment it with yeast for 15-20 days and distil it using very simple traditional distillation. They only use traditional yeast which they make using extracts of herbs mixed with maize flour. Who has the capacity to produce *ara*? Everyone, especially women who prepare it and they teach their children.
- In the kitchen garden next to the house, potatoes are planted in narrow rows so that more potatoes can be planted in a field. Pests are not attacking the local varieties right now because of the high altitude and spring temperature, but during the summer when the temperature rises, they do get pests. In the kitchen garden, they can control pests, but in the field it is more difficult. They use traditional potato varieties in the home garden, but in the fields they use a new commercial variety because the Indians buy it.



Q&A session in commercial potato field, Ura community. Frederik van Oudenhoven.

Ura commercial potato field

- They use a red variety of potato to sell to the Indians. Due to the problem of wild boars, people try to plant near their home, not near the forest.
- Why is the soil black? Because we always used to keep cattle in this field so it is full of manure – we are using it to grow crops for the first time.
- The weather has changed a bit because before we did not have this crop disease here, it started 5-6 years ago. So we have started spraying with pesticides. We have hailstorms which destroy cultivated crops. Very often now there is a shortage of rainfall so we have to plant a bit later.
- Do you have potato varieties adapted to drought? We have a modern variety that is adapted to drought and pests. So far we have not faced a big drought.
- Don't you think that local varieties are more resistant? Yes they may be more resistant to pests but they are not so good for the Indian market. The old varieties don't have such good yield and don't have a good shape so Indian people don't think they are economic.

- Advice from a visiting potato grower: when the soil is black because it has too much manure, it burns the potato because it absorbs heat from the sun, so it does not produce a good yield – that may explain why some plants in your field are damaged.
- How long have you been exporting this commercial potato? Since 1978 – everyone in the village grows it, we are more or less dependent on this potato product.
- How are you planting the potato? We used to cultivate it by slicing, but later on when our government introduced good seeds, they taught us to cultivate whole seed potatoes. We can cultivate the same seed for 2-3 years, it is not a hybrid.
- All the farmers take the potatoes to an Indian market near the border and the government is the middle man – Indians buy the potatoes at auction. They have an association of potato growers, and the government provides technical support and facilitates marketing.

Shrine, water mill and pasture

- The shrine to cows is here because cows give us milk.
- The traditional water mill is privately owned and people who use it pay the owner in kind not in cash, for example a few kilograms of grain. A Chinese participant mentioned that their mill is owned by the community and asked if this one was community-owned before? The local expert explained it was always privately owned, since it was built a 100 years ago.
- Pasture land is community held, we don't really have enough pasture. Is the community paying a tax on the pasture land? No. A long time ago, before 2007, people owned the pasture land, but now the land is owned by the government, but people can still use it.



Ura community leader answering question of Jangbi community leader, Ura. Frederik van Oudenhoven.

Thematic working groups on common challenges

Towards the end of the workshop, working groups were held to enable communities from different countries or regions to discuss four key themes and common challenges that had emerged during the workshop:

1. tropical forest change
2. human-wildlife conflicts (wild boars)
3. potatoes in the highlands
4. revitalising culture in southwest China

1. Tropical forest change

The group included representatives from the Eastern Himalayas, Taiwan, Papua New Guinea, the Philippines and northeast India. It discussed the changes happening to the forests in their communities as a result of climate change, government policies and natural disasters. The main points were:

- **PNG and northeast India:** shifting cultivation is the primary cause of forest change, pushing primary tropical forest further away from the communities. In tropical mountain forests, soil fertility is lost very fast as the forest are cleared for agricultural activities. This is leading to the loss of primary forest. The forest change is accelerated by climate change which creates favourable climatic conditions for invasive grass species which is taking over cleared forests, replacing native tree and plant species. The challenge is how to balance subsistence agricultural activities, which are very important to the communities, and minimising the destruction of the primary forest. In the mountain communities of PNG, a piece of land cannot be used for gardening for several consecutive years because soil fertility is lost quickly and virgin forests must be cleared constantly.
- **Taiwan:** forest ownership is claimed by the government for the cultivation of monocrop agriculture for export. This has resulted in clearing of larger forest areas than the indigenous communities used to clear for subsistence farming. The Taiwanese government does have policies to protect the forest but mainly for the benefit of eco-tourists and foreign income which marginalises indigenous communities. The government also has a reforestation policy but it is mainly focused on a few introduced commercial timber species. The government policy is somewhat ignorant about the traditional ecological knowledge (TEK) of the indigenous people that is tied to the forest.
- **The Philippines:** the three typhoons in the last 2-3 years have totally devastated their forests, destroying thousands of hectares of primary forest. Huge landslides are also common in the mountains which destroy the forest. For the past 15 years or so, most tree species in Philippines are not flowering and fruiting resulting in major ecological changes in the forest. For instance, many bird species and other animals have migrated away from the forest due to lack of food availability. There are also notable declines in honey bees. The government is addressing this issue and has replanted more than 500 hectares with trees.
- **Thailand:** government policies relating to forests has painted a bad image of indigenous peoples. The policies for national development take precedence over indigenous concerns. For instance, the government has placed emphasis on monocropping for export which has led to clearing of large areas of forest. The government has a conservation policy but it focuses mainly on increasing the size of forest conservation areas which leads to resettlement of indigenous peoples and marginalisation. There were efforts to promote traditional ways of managing natural resources but this did not receive much support from the government. The traditional forest management system such as intercropping helped recover the forest but the government does not support these local initiatives and methods for forest conservation. However, the government is open to discussing the sustainable management approach of the indigenous peoples to conserve forests.

- **Northeast India, Arunachal:** the cause of major change to forests is forest fire and shifting cultivation which is also true for mountain communities in PNG. Many forest areas are destroyed in Arunachal for urbanisation and development. The illegal harvesting of valuable medicinal plants for cancer cures is also very common in Arunachal. The government is trying to address this issue by way of policy change but it's still at the draft stage. A biodiversity management committee comprising of community members and government has been set up to address illegal harvesting of valuable medicinal plants.

Suggestions for improvement

- *Thailand:* promote traditional forest management practices.
- *Northeast India:* there is a current project called the People's Biodiversity Register (PBR) in which the community is involved in documenting their biodiversity for management but funding is needed to support the initiative. Such initiatives to document forest biodiversity by local communities should be identified and supported.
- *PNG and Northeast India:* replanting of native tree species in the landscape to recover the forest that has been lost as a result of shifting cultivation.
- *Thailand:* shifting cultivation is not harmful for the forest in Thailand but the government does not fully support this practice of the indigenous communities. The government needs to recognise local practices that are friendly to the forest and the environment.

Recommendations for addressing forest change issues

At International policy level, governments must:

- recognise traditional forest management systems
- recognise traditional knowledge holders and how this knowledge is used
- promote exchange of information among mountain communities

At local policy level:

- There should be policies to manage community forests.
- Young people should be able to learn traditional knowledge associated with managing forests.
- Basic rights of the indigenous peoples to use their forest must be recognised.
- Local communities/indigenous peoples must be consulted on any policy and decision on the forest on which they depend on and communities must be actively involved.
- If there is any problem associated with managing forests, the communities should be allowed to find the solution.
- There is a need to understand the balance between forest use and forest destruction.
- Self-sufficiency of local communities must be promoted as cash cropping will always depend on external resources.

2. Human-wildlife conflicts (wild boars)

The group included community representatives from Bhutan and nearby regions in the eastern and central Himalayas in India which are facing similar problems of increased crop raiding by wild boars in recent years. This is a problem in both the Jangbi and Ura communities – it makes life very hard. It is also a growing problem in the central and eastern Himalayas. The impacts of human-wildlife conflict include complete loss of crops, loss of livelihood, reduction in crop yields and the need for extra efforts for crop production.



Working group on wild boars, Ura community temple. Krystyna Swiderska.

Possible causes of human wildlife-conflicts

- Increased population of wild boars due to the killing of predators like wild dogs and tigers by farmers and poachers.
- In the case of Ura and Jangbi it is due to the increase in forest coverage especially near the farms due to strict conservation activities. Restriction of shifting cultivation in Bhutan has led to more problems with wild boars because it has increased forest cover especially near the communities. Shifting cultivation is restricted due to the legal requirement of having 60 per cent forest cover in Bhutan at all times, and because communities don't have enough land for shifting cultivation.
- In India, wild boars are raiding crops due to loss of their natural habitat, which is partly due to forest degradation and is also thought to be linked to increased forest fires due to rising temperatures and reduced rainfall. The problem is also due to government policies restricting the killing of animals by farmers.

Adaptive measures and possible solutions

In India, the farmers use raw lime stuffed in dough to kill the wild boars. For Ura, there is crop damage compensation from the government. In all the communities, farmers stay in the fields at night to protect their crops. Possible solutions and government interventions include:

- electric fencing around fields and provision of financial support for fencing
- digging deep drains around farms to prevent wild boars entering them
- control of wild animal populations by killing and marketing their meat, and change in government policies to allow killing of wild animals
- provision of crop-damage compensation.

3. Potatoes in the highlands

This group included potato farmers from the Ura community (Bhutan) and the Potato Park (Peru) and Kyrgyzstan. In Ura, they mainly grow commercial potatoes for export, and in the Potato Park they grow traditional potatoes.

Discussions centred around the different techniques to produce good quality, vigorous and virus-free potato planting material and seeds. A Kyrgyz potato breeder and farmers from the Potato Park explained the methods they use. These were completely unknown to the other (mostly Bhutanese) farmers, and of great interest. Most (non-Quechua) participants grow potatoes as a cash crop and face increasing difficulties producing good harvests. The farmers who explained the breeding methods emphasised the need for collaboration with scientific organisations which have the facilities and expertise to work with crops at such a technical level. This is especially important for potatoes.

A farmer from the Kochkor community in Kyrgyzstan (Mr. Kushbek Beishenkulov) brought three elite seed potatoes from his potato field. During the working group discussion he gave the potato seeds to a local farmer. They also exchanged their experience of potato-growing technology. The next day the local farmer said she had already planted the potato in her field. So it was a first step for future seed exchange activity within the Network.

Despite the differences in the varieties grown and objectives of cultivation, the farmers still want to exchange potato varieties, and all the farmers were eager to receive planting material from the Potato Park.

4. Revitalising culture in China

The communities from Guangxi and Yunnan province discussed how to revitalise culture. In the Naxi stone villages (Yunnan) they plan to revitalise customary laws for management of natural resources including landscapes, watersheds, water resources and local seed and crop systems, and traditional Naxi culture and practices. They are planning to establish a Stone Village Naxi Culture Centre. In Nonlv village in Guangxi, they are forming a working group to co-ordinate collective activities for the revitalization and enhancement of their traditional culture. Meanwhile, they are following a 'community support agriculture' approach and using existing farmer co-operatives to link their produce to urban consumers. These co-operatives provide a platform for adding value to local natural resources and traditional practices like duck-in-rice and fish-in-rice pest management, participatory varietal selection and participatory plant breeding (PPB).

Establishing a network of indigenous mountain communities

1. Country proposals on network objectives and structure

Participants discussed the need to establish an international network to respond to climate change challenges, and to enable learning between farmers (for example between those who are growing similar crops). What should be the main objectives and key themes for the network? Each country group put forward their vision for the objectives and structure of the network and the next steps:

China: we fully support the formation of a network. The objective of the network should be to:

1. Enhance the ongoing capacity of communities in the network for adaptation to climate change.
2. Summarise some good cases from the network like the Potato Park, PPB and the IPCCA (Indigenous Peoples' Climate Change Assessment) to facilitate scaling out and up to other communities in the group and globally.
3. Conduct policy advocacy and policy support because communities sustaining traditional farming systems are the basis for resilience and for the continuity of food and farming systems in the future.

Central Asia: the network needs to be established between mountain farmers in rural areas and the farmers should play a role in decision making because people in cities don't understand them and because farmers are the carriers of TK. International organisations working on human rights or policy should tell the governments in our countries how traditional farmers are important for food security and agriculture. The network should facilitate exchange of best practices for adaptation to global changes. In terms of next steps, an international organisation should support the establishment of the network – and perhaps a UN organisation could provide financial support for the network. A co-ordinator in an international organisation should be responsible for the network and there should be one co-ordinator in each country.



Country working groups in the Temple, Ura. Krystyna Swiderska.

The Philippines: our vision for the international network is as follows:

1. A sustainable cultural and traditional development framework which leads us to become a sustainable mountain people through the implementation of, for example, ancestral domain plans for sustainable development.
2. To sustain the customary laws of mountain peoples.
3. To become an open place to respond to governments.

India: the main objectives of the network should be:

1. Protection, preservation and strengthening of traditional farming systems and practices (this is very important).
2. Constant exchange between the network of best practices, seeds and traditional knowledge.
3. Increasing the capacity of communities to adapt to climate change in ways which are sustainable and economically viable.
4. Advocating the importance of traditional knowledge and adaptation practices at national and international levels.

In terms of its basic structure, there should be local networks (within the international network) which can meet more frequently.

Kyrgyzstan: this network is very important. It should be organised at global level and act locally – so each region should have local focal points. It should analyse and distribute information back to local communities. It should build links between scientists and farmers, and actively involve young farmers. The next steps should be to organise exchange meetings annually and initiate activities at global level to reduce pesticide use and promote organic farming; and to develop project proposals for the revival of biodiversity and biocultural heritage at local level and raise funds.

Taiwan: to respond to the ecological crisis caused by the impact of climate change, the integration of science and community development visions is vital – so this is our vision for the network. The objectives of the network should be:

1. Food sovereignty as the entry point to respond to the ecological crisis – e.g. we would like to promote TEK relating to seeds, through seed sharing and sharing knowledge related to seeds.
2. It is very important to engage with government policy to make it more 'friendly' to our concerns.

Instruments to implement these objectives:

1. We need a basis to share and exchange our knowledge, like a TEK classroom, including in the field, and we want to invite elders with knowledge and young people to come into the classroom.
2. We need a workshop like this, a walking workshop to see the problems and develop responses.
3. External networking with issue-based or regional concerns.

Bhutan: our vision for the network is to strengthen mountain communities by upholding traditional cultural values and economic development. The objectives and activities of the network should be:

1. Strengthen cultural values: set up by-laws requiring communities to use TK and strengthen traditional activities which have been practiced for a long time; strengthen local foods and share different types of local foods.
2. Secure the local environment, which is very important for agriculture, for example by planting trees and protecting watersheds, and practising organic farming.
3. Improve people's livelihood : technology transfer and capacity building, linking local government and communities. Integrated farming systems, such as agroforestry, are good for livelihoods.

In terms of structure, a local organisation should be set up in each country headed by a chairman, who is responsible for linking with international organisations, government and NGOs.

Papua New Guinea: we agree that we should establish a network. The vision should be as follows:

1. From a country perspective we would like to strengthen our cultural values and traditional knowledge at local and national level.
2. At local level, to match TK in the school curriculum.

In terms of next steps, we would like to see the establishment of a biocultural institute that would oversee the achievement of these objectives. In terms of structure, we appreciate what the MCI has done and we feel that the network should be established under the ISE Global Coalition. There should be a country or regional co-ordinating body that would oversee the network and coordinate with the international network.

Peru: we are very excited about the idea of this network – as a group we will have a much stronger voice if we are trying to influence policy. Objectives of the network should be:

1. To support and strengthen local and traditional knowledge systems and research.
2. To try to influence policies at *international* level, and national and regional level.
3. Focus in particular on maintaining and enhancing diversity and cultural values.

Next steps:

- Finish this event with a formal agreement to establish the network.
- Form some kind of co-ordinating committee at international level, and regional committee meetings could be held in between the international ones.
- Share information from our community.
- Start thinking about some of the main events we could organise.
- We can communicate over the internet.

Thailand: vision: at regional level, to create a cooler world. Objectives:

1. To create a new world based on traditional knowledge and practices to adapt to climate change.
2. To create a new generation in the new world who can adapt to climate change.
3. To get policy to recognise our knowledge and realities and to mainstream this so that it becomes the policy to support us.

The network should revitalise ecosystems, create a traditional knowledge bank that we can share, and create an alternative youth group to follow the process and help livelihoods – a ‘university of livelihoods for people who stay in the forest’. The structure of the network should include youth, gender and other academics to support the network – but it needs to become a living structure.

Summary

The international network should be a loose network that comes together through the internet and also meets face-to-face to share knowledge. The network should focus on local action – it should have a small structure at global level, but a very strong network at local level for revitalising traditional practices etc. which can meet more frequently.



Coordinators' meeting, Ura community. Akylbek Kasymov.

2. Consolidated proposal for the network objectives and structure

Based on the discussion above, a small working group proposed the following basic objectives and structure for the network, for consideration by participants:

1. To strengthen the capacity of indigenous and traditional mountain peoples for adaptation to climate change and food sovereignty, by revitalising their biocultural heritage.
2. To exchange knowledge, strategies and innovations relating to climate change impacts and adaptation through a traditional knowledge bank, case studies and learning exchanges.
3. To advocate for policy changes at international and national level to enhance support for biocultural heritage-based adaptation and protect the rights of mountain peoples over their biocultural heritage.

In terms of structure and activities, there should be:

1. A network co-ordinator in each local community who can liaise with the community and act as the representative for decision making, in consultation with the community.
2. A national co-ordinator to link the participating local communities to the international network, and link the local community network to other relevant local or national networks. They should ensure that the youth are involved, and link the communities with scientists and policy makers when needed.
3. An international network co-ordinator, an internet-based platform for sharing knowledge and an email group list. In some cases, regional networks of mountain communities could also be established with regional co-ordinators (for example in the South Pacific region).

Participants stressed that the network should work through learning exchanges and that the walking workshop methodology is essential. International exchange meetings should be held every 1-2 years for community capacity building. These are also important for generating evidence for policy advocacy – on climatic changes, impacts and the responses needed. The network should be locally driven and should also support local adaptation activities in between the international meetings. It should spread

ideas, lessons and innovations. Several communities do not have access to the internet, but video conferences could also be organised for learning exchanges.

A key objective of the network should be to facilitate the exchange of seeds between communities and enable communities to access seeds in gene banks to enhance their adaptive capacity. But how can this be done under the legal frameworks of each country? The Potato Park signed an agreement to share seeds under the Multilateral System (MLS) of the Food and Agriculture Organization's (FAO) International Treaty on Plant Genetic Resources for Food and Agriculture, with help from the CIP. The network could also use the MLS as the legal basis for seed exchange, and develop agreements in the context of the FAO Treaty's provisions on Farmers' Rights. This would enable the MLS to support farmers' rights and provide access to seeds for adaptation by farmers. Alternatively, the network could facilitate direct seed exchanges based on customary laws, as communities have always done. We need to explain the FAO Treaty to our communities.

The Bhutan Declaration on Climate Change and Mountain Indigenous Peoples

The workshop culminated in the development of the *Bhutan Declaration on Climate Change and Mountain Indigenous Peoples*. The Declaration was read out during the opening plenary of the 14th Congress of the International Society of Ethnobiology on June 1st 2014, by the Karen youth representative from Thailand in her local language. This was preceded by a traditional 'bird' dance by the Philippines elder and a simultaneous prayer by representatives from each of the 25 communities in their local languages, as a mark of unity in diversity.

The Bhutan Declaration announces the formation of an International Network of Mountain Indigenous Peoples, and the establishment of a seed exchange programme between the communities of Peru, China and Bhutan, which will be expanded to all communities in the network. It stresses the importance of indigenous agricultural traditions that have provided important food crops critical for food security, and explains the challenges these farming systems face due to recent climatic changes. It calls on governments, researchers, civil society organisations and the international community to recognise the sacred nature of Mother Earth and respect indigenous peoples' worldviews and cultural and spiritual values, implement the UN Declaration on the Rights of Indigenous Peoples, promote traditional languages, and recognise the importance traditional knowledge for the conservation of mountain ecosystems and agrobiodiversity and adaptation to climate change. It also calls on governments and others to support exchanges of knowledge and seeds between communities, and to support the repatriation of seeds from international gene banks to communities to create more options for adaptation and ensure local food sovereignty and global food security (See Annex I).

Evaluation and reflections on the ‘walking workshop’

- *Taiwan*: we have derived much inspiration from how this workshop was organised – e.g. the coordination by Alejandro and the ‘walking workshop’ methodology, and the very strong links to communities. ‘The “walking workshop” is a wonderful methodology to facilitate indigenous community communication on responses to climate change’. We have had a very rich and practical interaction. The idea of spirituality emerges as the most important aspect to link people, land and nature.
- *Kyrgyzstan*: the workshop has been a very good opportunity to make new friends, learn about things that are happening at global level, and talk in open areas, fields and sacred sites.

‘The “walking workshop” is a wonderful methodology to facilitate indigenous community communication on responses to climate change’

‘All 25 communities have the same spiritual connection to the land and forest, regardless of language.’

- *Papua New Guinea*: the discussions were very productive, we’ve learnt a lot. ‘All 25 communities have the same spiritual connection to the land and forest, regardless of language.’
- *Bhutan*: it was an informal, interactive workshop in which we could exchange views, so we are very happy to meet other communities, we’ve learnt a lot and we are going to implement the things we have learnt.

- *Potato Park (Peru)*: the workshop provided a good opportunity to learn about very specific issues, like the use of local materials to make drinking cups. We liked walking and learning in nature. Our favourite part was the cultural nights and exchanges to experience food and music from other countries. We would like to thank the donors. The exchange has reinforced our interest in the connection with nature and the importance of youth.
- *Thailand*: the walking workshop leads to the practical context of people and links to the spiritual context. It would be good to have a number of youths attending.
- *The Philippines*: we appreciate seeing the people with their traditional attire. Comparing the two communities, this one is more developed. The elder would have liked to have an exchange with the elders in the host communities.
- *China*: we liked the emphasis on culture and the spiritual world – we need to enhance this a lot in our communities. The farmer from Guangxi wants to enhance spiritual values of her communities after this exchange; and the Naxi farmer wants to strengthen customary laws in the stone villages, bring back traditional culture and conserve landraces. We liked visiting the communities and learning about their culture and food. We would have liked more understanding of the background of each community that participated – for example a poster session with photos – this can help us find common themes. For the thematic working group discussions we would have liked more consultation on the choice of themes – for example we would have liked to talk about drought. We would also have liked everyone to bring seeds for exchange.

‘the walking workshop leads to the practical context of people and links to the spiritual context’

‘We would also have liked everyone to bring seeds for exchange’

- *India*: the methodology is informative and interactive so we can express all our views. It was a great experience for the elders from the central Himalayas and they liked the food fair and shared knowledge about palm cooking with the people of Jangbi. We learnt that shifting cultivation does not destroy ecosystems but is beneficial, so we can transfer that knowledge to our community. The farmers from the eastern Himalayas learnt about PPB and that they can grow lowland foods in the highlands. The decline in biocultural heritage in our communities affects traditional beliefs and belief in culture – this kind of gathering reinforces such beliefs in local communities.
- *Tajikistan*: thanks to the donors and all the participants. We liked using field work, talking outside, and sharing videos and food. It is already a network. The challenges were transportation – it took a lot of time.
- *Yunnan TV film crew*: this workshop has taught us about the importance of traditional knowledge and culture for adaptation to climate change and as a result, we will now focus more on these issues. We have reported on the extreme drought in Yunnan in the last four years, but not on adaptation solutions based on TK. In China, we use more and more modern technologies for adapting to climate change but don't pay much attention to the TK of remote ethnic groups who are closer to the land and have a lot of experience of adaptation.
- *Taiwan indigenous TV*: it was great to participate in such a professional activity. We need professional reporters to report on indigenous peoples' rights more effectively.

Next steps: Establishing an international network

The first step will be to set up an interim co-ordinating committee for the inception phase, and then a more formal committee can be established. The interim committee should include three members of the network, and should take the lead in fundraising for the inception phase and setting up the network, including developing the web-based information hub on indigenous knowledge for adaptation, further developing the structure of the network and defining the agenda, and organising the next learning exchange. Funding is also needed to support local action-research on adaptation in the local communities in between network meetings. Communities also need training to implement adaptation responses, for example for participatory plant breeding and community supported agriculture.

Each country group was asked to nominate representatives for the interim committee, taking into account that some people already have experience of indigenous peoples' networks. Each country nominated Alejandro Argumedo (Peru) to be part of the committee, and Krystyna Swiderska (UK), Prasert Trakansuphakon (Thailand), Frederik van Oudenhoven (Netherlands) and Yiching Song (China) also received nominations. It was agreed that Alejandro Argumedo, who designed and chaired the MCI workshop, should make the final decision on the composition of the interim committee.

Three countries offered to host the next learning exchange: China, Taiwan and Tajikistan. A ballot was drawn and Taiwan was selected as the first host country, followed by Tajikistan and then China.

The new network will be launched at the forthcoming United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP) in Lima in December 2014, and at IIED's Community-Based Adaptation workshop in Nairobi in April 2015.

Annex 1 – The Bhutan Declaration on Climate Change and Mountain Indigenous Peoples

URA COMMUNITY, BHUTAN MAY 31, 2014

We, over 100 indigenous peoples and traditional farmers from 25 communities in 10 countries speaking 22 languages, together with civil society organisations and research institutions, gathered in Bhutan in the communities of Jangbi and Ura from May 26 to June 1, 2014, to analyse the impacts of recent climatic changes on Mother Earth and on the livelihoods and cultures of indigenous peoples in mountain regions, and to develop responses to this crisis.

Our communities include the Monpas and Uraps of Bhutan; the Naxi and Zhuang of China; the Kumaon, Lepcha, Limboo, Monpas, Newar and Sartang of India; the Batken, Kochkor, and Kopro-Bazar from Kyrgyzstan; the Herowana-Ubaigubi, Jiwaka and Yupna of Papua New Guinea; the Rasht Valley, Shughnan and Wakhan Valley communities of Tajikistan; Quechua communities of the Potato Park from Peru; the Mintapod community of the Philippines; the Tayal, Kananava and Pangcah of Taiwan; and the Pgakenyau Hinladnai of Thailand.

Our gathering took the form of a 'walking workshop', which provided the appropriate methods and tools for an effective exchange of ideas and experiences, the airing of common problems and a collective brainstorming on possible solutions. It included food and video festivals and direct interaction with the people of Jangbi and Ura. This creative tool for networking and promoting our special indigenous spirit and sense of mission concluded in the formation of an International Network of Mountain Indigenous Peoples. We are happy to present to the international community this promising new network on the occasion of the 14th Congress of the International Society of Ethnobiology.

We are also happy to announce that we have initiated a unique seed exchange program between the Potato Park in Peru, the communities in Yunnan, China and the Ura and Jangbi communities in Bhutan. This exchange will be expanded to other members of the network, being mindful of local ecosystems, culture and indigenous peoples' intellectual property rights.

Mountain biocultural systems are home to many indigenous cultures and languages, and are rich but fragile repositories of cultural and biological diversity, water and other critical ecosystem services. Of unique importance are the indigenous agricultural traditions that have provided us all with important food crops critical for the food security of the world. These are the result of the traditional knowledge and innovation systems of our peoples. The survival of our knowledge systems is critical for the survival of humanity.

We found that in many mountain regions, indigenous and traditional cultures already face drastic changes in their food and agricultural systems, including changes in rainfall patterns, increased temperatures and increased pests and diseases. For example: a 50-60 per cent decrease in water sources in the eastern Himalayas, extreme drought in southwest China, extreme rainfall in Taiwan, extreme typhoons in the Philippines, and rains arriving too late or too early in many cases. In Quechua communities, potato cultivation is moving up in altitude due to increased temperatures and pests and diseases; in Papua New Guinea animals that people depend on for food are migrating to higher levels due to increased temperatures; while unusual weather patterns are affecting forest ecology in Thailand and crops in Kyrgyzstan. As a result, the often-intimate connections between people and agricultural crops are strained, as are the community institutions, traditional values and spiritual beliefs that underpin them.

Even though we are suffering disproportionately from climate change impacts, we contribute the least to global emissions; nevertheless we have been marginalised from participating in the development and implementation of policies, programmes, plans and actions related to our local adaptation.

As an emerging International Network of Mountain Indigenous Peoples concerned for the future of mountain ecosystems and the livelihoods of our communities, and in the spirit of solidarity and reciprocity, we call upon governments, research organisations, academics, civil society organisations and the international community to:

1. Recognise the sacred nature and inherent rights of Mother Earth, particularly to its diversity, richness and the welfare of all its children, including plants, animals, rivers, mountains, birds, wind, rocks, spirits, etc., and adhere to the principles of reciprocity and balance with nature, which nurtures life for everyone.
2. Acknowledge and respect the worldviews and cultural and spiritual values of indigenous peoples and traditional farmers, and recognize the sacred nature of their seeds.
3. Respect and promote the Biocultural Heritage rights of indigenous peoples and traditional farming communities and fully implement the UN Declaration on the Rights of Indigenous Peoples.
4. Promote the use of indigenous and traditional languages as living libraries of critical traditional knowledge associated to mountain biocultural heritage; and provide adequate funding for indigenous educational processes, learning models and pedagogical practices, involving the youth and elders in knowledge transmission.
5. Recognise the contributions of traditional knowledge to the conservation and sustainable use of mountain ecosystems and their agro-biodiversity, and support the creation and management of traditional knowledge banks that would allow us to share appropriate adaptation strategies and continue innovating.
6. Support processes for bridging traditional knowledge and science to create effective methods and solutions for the conservation and sustainable use of agro-biodiversity, food security and climate change adaptation; while respecting our right to reject the use of technologies such as genetically modified organisms and geo-engineering for being an attack to the integrity of Mother Earth.
7. Support and promote cross-cultural exchanges of knowledge, innovations and technologies among indigenous and traditional farming communities from mountain ecosystems to enable them to find appropriate and effective solutions to common challenges.
8. Support activities around the International Year of Family Farming, and recognize the value and contributions of traditional agricultural systems to national food security by integrating traditional knowledge into sectoral policies, plans and programs at the national level.
9. Support seed exchanges and the repatriation of seeds from international gene banks to create more options for adaptation and ensure local food sovereignty and the food security of the world.
10. Support the strengthening of local governance, customary laws, traditional authorities, and the wisdom and participation of elders.

We call on indigenous peoples and traditional farmers to assert their Food Sovereignty and to first and foremost give importance to the food and nutrition of our children, and we call upon national governments to fully implement the Right to Food.

Finally, we want to reaffirm our commitment to working together and in our own communities towards our goals of ensuring food sovereignty and fostering biodiversity-rich agricultural systems and the protection of our Biocultural Heritage and local rights.

Annex 2 – Mountain Communities Initiative workshop – participant list

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SIFOR (Smallholder Innovation for Resilience) is an action-research project working with indigenous communities in India, Peru, China and Kenya, coordinated by the International Institute for Environment and Development (IIED). It aims to revitalise indigenous knowledge, crops and innovation systems for food security in the face of climate change.

SIFOR teamed up with Association ANDES and the International Society for Ethnobiology (ISE) to organise the Mountain Communities Initiative (MCI) Workshop in Bhutan in May-June 2014. The workshop brought together 25 indigenous mountain communities from 10 countries (mainly in Asia) to explore the climatic changes affecting their food and farming systems and share knowledge and experience on how best to adapt. This report summarises the results.



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