Biocultural Heritage Territories walking workshop

Potato Park, Chalakuy Park and Huaran, Cusco, Peru

INMIP
International Network of Mountain Indigenous Peoples

Sixth global learning exchange of the International Network of Mountain Indigenous Peoples

30 May to 4 June 2024

About the International Network for Mountain Indigenous Peoples (INMIP)

INMIP is a network of Indigenous communities and their partner organisations in 14 countries: Bhutan, Bolivia, China, India, Kenya, Kyrgyzstan, Mexico, Nepal, Papua New Guinea, Peru, the Philippines, Taiwan, Tajikistan and Thailand. INMIP was formed for capacity building in establishing and implementing Biocultural Heritage Territories and for sharing knowledge on climate change adaptation and the development of innovations that support resilience. INMIP is an important instrument for supporting implementation of local, national and international climate change programmes and policies, and to strengthen sustainable management practices in mountain territories.

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Summary

Over 50 representatives of Indigenous Peoples (IPs) and local communities (LCs) from mountain regions in Peru, Bolivia and China and semi-arid coastal Kenya, along with researchers, nongovernmental organisations (NGOs), local government and donors, came together in the Andes of Peru from 30 May to 4 June 2024, for a six-day horizontal learning exchange and walking workshop. The event, organised by the International Network of Mountain Indigenous Peoples (INMIP) with support from the International Institute for Environment and Development (IIED), aimed to enhance capacity to establish Biocultural Heritage Territories, and explore key challenges facing IPs and LCs and effective responses based on biocultural heritage (interlinked traditional knowledge, biodiversity, landscapes, cultural and spiritual values, and customary laws). INMIP is a global network of mountain communities in 14 countries, with a secretariat at Asociacion ANDES (Peru). It aims to establish a global network of Biocultural Heritage Territories, strengthen climate resilience and biocultural adaptation of mountain communities, and promote supportive policies.

The sixth INMIP learning exchange took place at the ANDES Yachay Kuychi Pluriversity in the Sacred Valley of the Incas and involved walking workshops in the Potato Park and Chalakuy (Barter) Park Biocultural Heritage Territories. It included an international policy forum on climate change and agroecology in mountains, and culminated in a Declaration targeting climate and biodiversity policymakers. The walking workshop methodology of community-to-community learning is based on holistic Indigenous approaches that include the landscape and Mother Earth in the transmission of knowledge. Indigenous experts and youth led the sharing of traditional knowledge in and around farmers' fields.

On day 1, participants visited the Potato Park for the International Day of the Potato celebrations. The Potato Park communities took part in competitions to showcase traditional potato rituals, dances and clothing and native potato diversity. The Potato Park proposed the national day of the potato on 30 May in Peru, and it was then adopted by the UN as the International Day of the Potato. The opening ceremony of the exchange centred on the Chakana cross, which represents Andean understanding of space and time, ways of learning, social-ecological systems and legal-normative values.

Challenges facing mountain and semi-arid communities

The INMIP exchange was opened by Bolivia's Minister of Environment, who stressed the need to address climate change impacts on IPs in mountain regions, including reduced water resources and increased waterborne diseases. Bolivia has adopted a new framework of 'Vivir Buen' or 'Living Well' which promotes participation of IPs in policies, and aims to protect the rights of Mother Earth.

Mountains provide 60–80% of the world's freshwater, and are home to 50% of global biodiversity hotspots, rich agrobiodiversity for climate resilience, and key ecosystems for climate mitigation (for example, forests, natural pastures and wetlands). IPs play a vital role in conserving mountain ecosystems and biodiversity based on traditional knowledge. According to the Intergovernmental Panel on Climate Change (IPCC), mountain Indigenous and local knowledge systems strongly support integrated adaptation and mitigation strategies. Semi-arid regions also sustain vital biodiversity, cultural heritage and ecosystem services. But mountain and semi-arid and dryland regions are highly vulnerable to climate change, with temperatures rising faster than the global average, and glacier melts reducing water resources.

Participants identified a number of challenges facing mountain and semi-arid communities, including: adverse climatic events, changes in seasons, increased temperatures and pests, reduced productivity, mudslides, and reduced water resources; forest degradation and biodiversity loss; growing pressure from extractive industries and pollution; and loss of traditional knowledge, languages and traditional crops due to youth outmigration. In the Stone Village (China) mountain mudslides due to heavy rainfall have killed people, and most youth have migrated to cities for work, so traditional knowledge is not passed to the next generation and young people do not speak the Naxi language. In Rabai, coastal Kenya, sacred Kaya forests used to be conserved, but now the youth are degrading them due to loss of traditional knowledge and lack of respect for Kaya elders' rules, "so the river is dry most of the time", reported Rabai participants.

Andean communities in Cusco, Peru (Potato Park, Chalakuy (Barter) Park and Q'eros) reported loss or shrinking of glaciers, reducing water in lakes. In the Potato Park, the lower planting line for potatoes has risen by 200 metres in 30 years due to rising temperatures and soil pests, leading to loss of farmland and potato varieties. Climate change impacts are being exacerbated by mining, which uses and pollutes water — in Q'eros community "the trout are getting sick" due to chemical-intensive informal mining, which affects the whole Paucartambo region. Mining concessions also threaten the Potato Park and Chalakuy Park. In Kenya, Kaya forests rich in minerals are being encroached on for mining, whichhas brought few economic benefits for communities. Communities in Peru are also concerned about genetically modified organisms (GMOs) that threaten agrobiodiversity, and about growing pollution from agrochemicals.

Biocultural solutions to address key challenges

Communities have developed a number of biocultural solutions to address these challenges. In Peru, Andean farmers rotate their crops and leave land fallow for 5–7 years (for grazing) as a way to control pests and diseases. They are also protecting lagoons and native plants, which conserve water, and creating dams to reduce water flows from lakes due to glacier melts (for example, Q'eros). Participants from all countries stressed the importance of using native species for reforestation as exotics often use a lot of water and don't benefit communities, and of conserving agrobiodiversity and traditional knowledge to enhance climate resilience. They also stressed the importance of ancestral philosophies of wellbeing and cultural and spiritual values for conserving biodiversity and landscapes.

The Stone Village (China) has set up a women's seed group and traditional dancing group, and its customary water management system has enabled it to cope with drought. Community seed banks are playing a key role in agrobiodiversity conservation in the Stone Village, the Potato Park and the Chalakuy Park, which also has family seed banks. The Potato Park conserves 1,375 native potato varieties many of which tolerate frost and diseases. Planting mixtures of potatoes at different altitudes and positive selection for improvement are ancestral strategies that are key for climate resilience. The Potato Park also conserves three wild relative potato species (one is drought tolerant), which are used to enrich cultivated crops. Farmers conduct annual altitudinal transects to monitor climate change impacts on potatoes and select for resilience. Native potatoes don't need chemicals and maintain good yields, whereas "improved varieties have reduced productivity after four years". Similarly in China, the productivity of hybrid maize is declining as their genetic basis is narrowing. In the Chalakuy Park (Lares), one farmer grows 60–80 traditional maize varieties (yellow, white and red). Increasing numbers of pests due to climate change are managed using traditional methods (for example, local corn with very hard skin resists weavils). The Chalakuy Park has revived ancestral barter practices vital for nutrition, where food and seeds are exchanged between altitudes.

Participants stressed the importance of traditional varieties for maintaining productivity, the need to strengthen customary laws to enhance conservation and rights (for example, in Kenya where national forest conservation laws are not being adhered to), and the need to develop community statutes or norms (for example, to prohibit tree cutting or use of agrochemicals) that states should respect. Bolivia was declared a pluriversal state in 2009 and has a law that regulates agricultural production, which "has helped to confront big agricultural producers". Communities and local authorities should ensure intergenerational transmission of traditional leadership. The Mayor of Choquecancha community in the Chalakuy Park uses its budget to support the revival of traditional Inca leaders. Retaining youth in communities requires strengthening local biocultural economies. States should promote economic development based on Indigenous wellbeing concepts such as Buen Vivir and Sumaq Kawsay rather than extractivist paradigms, particularly in areas with very rich biocultural heritage such as mountains.

The Potato Park has resisted mining through strong organisation linking five communities: "if we are not organised anyone can come onto our land". Through the traditional 'linderaje' territorial boundary festival they check the landscape annually to monitor mining activities. The Potato Park is also legally registered as an Agrobiodiversity Zone which helps to prevent mining. It sustains rich traditional knowledge by passing it to children and youth through community meetings and engagement in farming, and by teaching Indigenous languages in schools. Transmitting traditional knowledge to youth also prevents engagement in mining and adoption of GMOs. The Potato Park influenced the introduction of the Cusco regional law to ban GMOs, which led to a national law banning GMOs

following pressure from different stakeholders (but the Ministry of Agriculture has tried to reverse this ban).

Establishing the Potato Park: learning from ANDES

Support from the Indigenous NGO Asociacion ANDES has been key to establishing the Potato Park biocultural territory. ANDES works with communities with an understanding of power and colonial legacies, recognising the colonial roots of western science and the continual innovation by communities, and focusing strongly on cultural values and IP's rights. It is very important for partner organisations to work in solidarity with communities.

At the start of the process there were conflicts between the communities. These were addressed "through the stories that the farmers were telling especially those with more experience with potatoes". Potato diversity had declined and the farmers remembered that in the 1970s, potatoes were collected from the communities. So the communities visited the International Potato Centre (CIP) in Lima and established an agreement with CIP to bring back 410 potato varieties and related rights, with support from ANDES and IIED. They also documented traditional institutions for resource management (for example, water, communal spaces, crops) and prepared maps to better understand the territory — biodiversity, crops, water, wildlife, and monetary and non-monetary economy. It is important to analyse the links between customary, national and international law to find frameworks to protect rights, and explore policies and laws that recognise traditional forms of governance, since pre-hispanic communal systems were destroyed by colonisation.

The main challenges are in terms of relationships between communities, for example, when a communal organisation is seen to impede individual interests, and external factors such as the impact of religion on traditional beliefs. But the communities have strong cultural identity, which is critical for the Potato Park to prosper. The fact that ANDES staff identify as Indigenous and are part of the struggle to maintain culture has helped build strong self-esteem in the Potato Park, along with a focus on Indigenous concepts, knowledge and tools (such as the Yupana matrix) as well as western science. ANDES is exploring how artificial intelligence (AI) can be used to strengthen Biocultural Heritage Territories.

The Potato Park governance model and biocultural economy

The Potato Park is an Indigenous Biocultural Heritage Territory which is governed autonomously by five Quechua communities. Its collective governing council, which is made up of elected Indigenous Presidents of each community, manages the park based on an inter-community agreement. The agreement, developed through an in-depth participatory process, sets out the duties, rights and functions of the Potato Park and its community members. The governing council also includes the Apus (sacred mountains) and 'técnicos locales' (Indigenous technical experts), who work in coordination with the presidents and assemblies of each community. Governance of the park is based on the ancestral 'Ayllu' concept where Sumaq Kawsay (holistic wellbeing) is achieved through balance between three Ayllus (communities): the human, the wild and the sacred. The sacred Ayllu includes the Apus with different roles, and gives rise to core values (customary laws) — reciprocity, duality and solidarity. "The fundamental basis for the three Ayllus is Pacha Mama (Mother Earth) — nothing else exists without her."

The Potato Park is "like a university where we teach traditional knowledge, wisdom, agriculture and climate change" to scientists, students and professionals who visit from different countries and pay entry fees". A Park administrator manages a communal fund, which receives 10% of the revenues from six economic collectives: medicinal plants and natural products, women's gastronomy, youth guides for trekking, crafts and textiles, potato guardians, and tourism and homestays. The funds are shared equitably among the communities at the end of each year in accordance with customary laws. Those who have contributed most to economic collectives and the Potato Park get the most. This prevents conflicts and ensures market linkages align with cultural and collective values.

Calling on UNFCCC and CBD Parties

At the policy forum, experts explored the impacts of glacier retreat on farming communities, false solutions to climate change promoted by companies, attempts to undo Peru's GMO moratorium; and mining and IP rights in Peru. Communities expressed serious concerns that emissions are continuing to rise: "at global level they are causing climate change and are doing nothing, and we are doing so much conservation". The INMIP Declaration calls on climate and biodiversity policymakers to fully integrate traditional knowledge into environment and development plans, and ensure the protection of IP's collective rights to territories and resources, including Biocultural Heritage Territories, to achieve global climate and biodiversity goals. It also calls on countries to reject false climate solutions including carbon markets, net zero and markets for environmental services — as they have not reduced emissions and seek to privatise communal resources — and to ban GMOs that threaten the diversity of native seeds.

INMIP participants, ANDES Pluriversity in Huaran, Cusco. Photo credit: Paola Andre Luna Veizaga

Potato Park technical experts and 3D model. Photo credit: Krystyna Swiderska

Introduction

Mountain peoples, ecosystems and climate resilience

Mountains sustain rich biological and cultural diversity. They are home to half of the world's biodiversity hotspots and many Indigenous and traditional peoples who continue to live in harmony with nature. Mountains provide critical ecosystem services for mountain peoples and downstream populations, including 60–80% of the world's freshwater and nutritious food and medicines. Mountain landscapes governed by Indigenous Peoples (IPs) and local communities (LCs) have a critical role to play in implementing the Kunming-Montreal Global Biodiversity Framework and the 2030 Sustainable Development Goals (Swiderska et al., 2022).

Mountains are also critical for climate change adaptation and mitigation. They host extensive forests, grasslands and wetlands, the protection of which can deliver large-scale greenhouse gas mitigation, according to the IPCC. The centres of domestication of most of the world's crops and many livestock species are located in mountains (UNGA, 2019). These provide resilient gene pools which are evolving and co-evolving for climate adaptation. Mountain Indigenous knowledge systems strongly support integrated climate adaptation and mitigation strategies, according to the IPCC (Adler et al., 2022). Traditional knowledge systems also provide solutions for biodiversity conservation, sustainable development and food security. They contribute to national economies in key areas such as water management, food production and sustainable use of land and forests.

However, mountain IPs and LCs are disproportionately affected by climate change impacts and economic and political marginalisation. Temperatures are rising above the global average in mountain areas, causing rapid melting of glaciers, enhanced disaster risk and biodiversity loss, and hampering agriculture and pastoralism (Adler et al., 2022). Many mountain IPs and LCs also face growing threats to their land and resource rights from unsustainable development (such as mining) and expansion of exclusionary protected areas. High levels of youth outmigration often hamper traditional knowledge transmission and increase burdens on women. Mountain peoples also suffer from weak representation in decision making at all levels, including global policy processes. These pressures are leading to the loss of resilient agrobiodiversity, and valuable ancestral knowledge and languages.

INMIP, Biocultural Heritage Territories and the Potato Park

INMIP: A global network of mountain communities

INMIP is a global network of Mountain Indigenous and traditional peoples and their local partner organisations. It currently includes members from 14 countries: Bhutan, Bolivia, China, India, Kenya, Kyrgyzstan, Papua New Guinea, Peru, Philippines, Taiwan, Tajikistan, Thailand, Mexico and Nepal.

INMIP was established in Bhutan in 2014, and has been consolidated through horizontal learning exchanges or "walking workshops" focused on fostering connections among mountain communities and sharing experiences and traditional knowledge. INMIP has held week-long walking workshops in mountain communities in Bhutan (2014), Tajikistan (2015), China (2016), Peru (2017), and Kyrgyzstan (2018). The continuity of these face-to-face exchanges was cut short due to the global COVID-19 pandemic.

INMIP's goals are to:

- Enable global coordination between Biocultural Heritage Territories established by mountain Indigenous communities, and strengthen capacity to establish Biocultural Heritage Territories
- Strengthen the resilience and climate adaptation capacity of mountain IPs and LCs, and exchange knowledge in an intergenerational and intercultural vision, and
- Promote inclusive policies in favour of mountain IPs and LCs and biocultural heritage at local, national and international levels.

For more detail on INMIPs' vision and goals see Annex 1. INMIP members agreed to establish a global network of Biocultural Heritage Territories at their second global exchange in Tajikistan. Annex 2 provides a snapshot of INMIP's emerging network of Biocultural Heritage Territories.

Biocultural Heritage Territories and the Potato Park

Biocultural Heritage Territories are made up of a mosaic of land uses, deeply linked to knowledge systems embedded in cultural traditions. Born of Indigenous Peoples' memories and lived experiences, they embody and protect their worldviews, spiritual values, customary laws, institutions and stewardship practices. They form the backbone of local economies and are home to critical genetic resources for food and agriculture. Across the world, years of local adaptation and traditional knowledge have shaped them into highly diverse, productive and resilient management systems that integrate sustainable development with biodiversity conservation (Swiderska et al. 2020; Swiderska et al., 2022).

Biocultural heritage territories have been defined as: "land use mosaics encompassing Indigenous and traditional land tenure, production and exchange systems, cultural identity, community organisation and simultaneous goals of endogenous development and biodiversity conservation" (Argumedo and Swiderska, 2014). Biocultural Heritage Territories share the three core characteristics of Territories of Life (formerly known as ICCAs) — a deep connection to territory and a functioning governance institution, contributing to conservation and community wellbeing — but they also have some distinct features:

- They do not focus on 'conservation' as their goal (as this is a western concept), rather on Indigenous or traditional peoples' own concepts of holistic wellbeing of people and nature, or balance and harmony with nature, but conservation is an outcome.
- They aim to be collectively self-governed by autonomous community institutions.
- They use decolonising and Indigenous methods and tools that revitalise traditional knowledge systems and build strong community institutions that can defend rights.
- They are a food-centred approach with a focus on agrobiodiversity and food sovereignty, recognising that IPs have conserved nature for millennia by linking food and nature rather than separating them.
- They strengthen biocultural solidarity economies that sustain cultural and spiritual values, biodiversity and traditional knowledge, rather than replicating the economic models that are driving their loss.

Biocultural Heritage Territories aim to protect and revitalise 'biocultural heritage' — the biodiversity and cultural heritage of Indigenous and traditional peoples, which are inextricably linked in their worldviews and practices (Swiderska et al., 2022). Biocultural heritage includes traditional knowledge and languages, biodiversity and landscapes, cultural and spiritual values and customary laws and their multiple interlinkages and interdependencies, as complex adaptive systems, which together sustain resilient local economies and food systems. These relationships are expressed in a multitude of Indigenous concepts — such as the Andean Quechua concept of Sumaq Kawsay, or holistic wellbeing, where the human, the wild and the sacred realms need to be in balance to achieve wellbeing. Biocultural Heritage Territories emerged from Indigenous Peoples' struggles for self-determination and a 20-year decolonising action-research process in the Potato Park (Swiderska et al., 2020). The Potato Park conserves rich agrobiodiversity, wildlife and ecosystems through traditional agroecological practices and deep reverence for sacred mountains and lakes (see Box 1).

Box 1: The Potato Park Biocultural Heritage Territory, Cusco, Peru

The Potato Park is an Indigenous Biocultural Territory established in 2000 by six Quechua communities near Pisaq: Amaru, Chawaytire, Cuyo Grande, Pampallaqta, Paru Paru and Sacaca, in a microcentre of potato origin, spanning 3,400 to 4,600 metres above sea level (masl). The Potato Park landscape of about 9,200 hectares is governed collectively on the basis of Andean cosmovision and customary laws, its goal being Sumaq Kawsay (holistic wellbeing), with the Apus (mountain gods) playing an important role in governance and the highest authority.

The Potato Park celebrates and conserves the rich agricultural heritage of the area including 1,375 varieties of native potato, 3–4 potato wild relative species, native crops such as olluco, oca, corn, quinoa and kiwicha, Andean camelids, and wild plants harvested sustainably for family food and health, through ancestral knowledge systems.

The communities maintain a wealth of traditional knowledge that leads the processes of territorial defense and local development and innovation. Indigenous knowledge and agroecological approaches contribute to territorial governance, food sovereignty and the development of biocultural products based on native agrobiodiversity. These processes are led by community authorities and a network of local experts ('técnicos locales'), who maintain dynamic collaborative relationships with scientists and national and international research centres.

This approach has generated an innovative process of integrated territorial management that promotes *Sumaq Kawsay* (Good Living) with a strong Indigenous identity and from a local perspective. It has also enabled the development of microenterprises that offer baskets of biocultural goods and services based on the special agroecological characteristics of the landscape and that use the potato as a charismatic species. For example, the gastronomy collective serves traditional foods grown in the Potato Park to visitors (such as educational tourists). It takes its name from the potato variety "Qachun Waqachi". Because of its irregular shape, this potato was traditionally used to test the patience and ability of potential daughters-in-law, to evaluate their aptitude to be the son's partner. It is a symbol of the traditions that the gastronomy collective protects and promotes.

The Potato Park has ensured community resilience and food and nutrition security despite severe climate change impacts in the high Andes. It has doubled incomes through economic collectives for biocultural products and services, and protects land rights against mining through community organisation and recognition as an Agrobiodiversity Zone, and is largely self-sustaining.

Sources: INMIP (2024); Swiderska et al. (2020); Asociación ANDES (2016).

Sixth INMIP learning exchange

Goals and participants

To advance its goals and strengthen coordination among its members, INMIP organised a face-to-face exchange, the first since the COVID-19 pandemic, between 30 May and 4 June 2024, in the Cusco region of Peru. This exchange included walking workshops in the Potato Park and Chalakuy (Barter) Maize Park, and three days of discussion and reflection at the Yachay Kuychi Pluriversity in Huaran, in the Sacred Valley of the Incas. The pluriversity is a programme of ANDES and a centre for intercultural learning, that uses a decolonial approach, reflects the diversity of knowledge systems and promotes dialogue between different epistemic traditions[1].

The exchange had two main objectives:

1. To develop the capacity of members to establish Biocultural Heritage Territories in centres of origin and diversity of crops, through practical training and exchange of experiences and knowledge, and
2. To explore common challenges faced by mountain IPs and LCs in relation to climate change, agrobiodiversity and water management, effective biocultural heritage-based responses, and opportunities to foster regenerative local economies.

The walking workshop brought together mountain communities from Peru, China and Bolivia (a new INMIP member), as well as semi-arid forest communities from coastal Kenya. Tajikistan was also due to participate but unfortunately the participants had problems with visas. It was not possible to invite all INMIP members due to budget constraints. Representatives from Rabai, coastal Kenya, were invited because their biocultural heritage — sacred Kaya forests and traditional knowledge — is seriously threatened and they are trying to establish a biocultural territory, inspired by the Potato Park. Although different ecosystems, Indigenous communities in mountain and semi-arid regions face similar challenges such as climate change impacts, loss of biodiversity, traditional crops and traditional knowledge, and water shortages.

[1] The Yachay Kuychui Pluriversity provides courses and exchanges on the establishment of Biocultural Heritage Territories, Indigenous methods and tools, water and spirituality, and Indigenous food systems and communitarian agroecology. It also hosts internships on different research topics relating to food systems, and conducts collaborative research on Indigenous rights and Biocultural Heritage Territories, Indigenous research methods and tools, climate change and Indigenous food systems, and methodologies for collaboration between Indigenous communities and scientists. See: www.andes.org.pe/whoweare/

Participants also included civil society organisations from Peru, researchers from the US and France, local government officials from Bolivia, Kenya (Rabai) and Peru (Lares), and a donor organisation from China (see participants list in Annex 3). Facilitation of the workshop days in the pluriversity was led by ANDES with support from IIED.

Walking workshop methodology

The INMIP exchange deepened its methodology of co-discovery and co-creation and horizontal community-to-community learning, which are based on holistic Indigenous approaches that include the landscape and Mother Earth as tools and actors in the transmission of knowledge. It took a holistic approach focusing on the intersections between biodiversity, food, climate, water and rights. The walking workshop was led by experts from the local communities through paths that feature remarkable landscape and cultural features in beautiful mountain Biocultural Heritage Territories.

In contrast to formal workshops, during walking workshops, discussions take place around significant landmarks, such as agricultural fields, sacred sites, ceremonial sites, water sources and places with signs of biological indicators. Participants actively observe, feel and evaluate landscape and cultural features, providing a spontaneous forum to share management and adaptation practices. Learning is 'horizontal' because it is based on knowledge shared by communities, rather than external scientist or experts. This reaffirms traditional and local knowledge systems and associated values.

The 2024 walking workshop in Cusco was co-designed by the Yachay Kuychi Pluriversity programme of ANDES and Indigenous experts from the Potato Park and Chalakuy Maize Park, who gave presentations and led walks, reinforcing the importance of IPs and LCs as experts with important traditional knowledge and practices.

Agenda

The exchange started with a visit to the Potato Park to join the annual celebrations of the International Day of the Potato on 30 May, and included two days of walking workshops in the Potato Park and Chalakuy Maize Park. It also included three days of reflection and discussion at the Yachay Kuychi Pluriversity in the Sacred Valley of the Incas, one of which following each day in the field. The final day included an "international forum on climate change policies and agroecology in mountain regions" where external experts presented on false climate solutions and key challenges facing mountain communities. Based on the rich learning and discussions, participants prepared INMIP's Huaran Declaration with specific calls to action for climate and biodiversity policymakers (The Huaran Declaration: Indigenous Peoples are the real solutions to the climate and biodiversity crises).

Day 1 30/05	Visit to Potato Park for International Potato Day celebrations. Opening Ceremony of the exchange at the pluriversity in Huaran (and explanation of Chakana Cross).
Day 2 31/05	Workshop in Huaran. Introduction to participants and their areas of work, exploration of multidimensional crises in mountains and semi-arid zones; mapping biocultural challenges and solutions in each community/country; methods, tools and processes for establishing Biocultural Heritage Territories.
Day 3 01/06	Walking workshop in the Potato Park. Biocultural Territory model and governance (Ayllu system), agrobiodiversity conservation, solidarity economy and biocultural products.
Day 4 02/06	Workshop in Huaran. Reflections on the challenges faced by mountain and semi-arid IPs and LCs, how Biocultural Heritage Territories can address these challenges, and governance of Biocultural Heritage Territories.
Day 5 03/06	Walking workshop in Chalakuy Maize Park. Visit to barter market, walk through traditional crop fields, visit to maize harvest and family seed banks.
Day 6 04/06	International Forum in Huaran, on climate change agroecology and water in mountain regions. Drafting the INMIP Declaration of Huaran.

Day 1: International Day of the Potato and INMIP exchange opening ceremony

International Day of the Potato celebrations

The International Day of the Potato was originally proposed by the Potato Park and was adopted as the national day of the potato in Peru. In December 2023, the UN General Assembly decided to designate 30 May as the International Day of the Potato to raise awareness of the multiple nutritional, economic, environmental and cultural values of the potato and its contribution as an invaluable food resource and as a generator of income for rural families and producers, with a view to achieving the 2030 Sustainable Development Goals. For the Potato Park, the day of the potato is an important celebration and occasion to reaffirm bonds between the Potato Park communities and celebrate their cultural and spiritual relationship with the potato, Pacha Mama (Mother Earth) and the Apus (sacred mountains).

The celebration took place in Pampallaqta community. It was opened by a local government representative and attended by all the Potato Park communities and a few tourists. It involved a series of competitions among the Potato Park communities that were judged by independent external observers from ANDES and INMIP. For the competition on potato ceremonies to the Pacha Mama, each community entered the field in a procession and built a shrine centring potatoes. They then told stories and performed a traditional ceremony and traditional dance. They wore traditional dresses and the whole group, made up of different genders, age groups and roles (with different dresses), danced across the landscape in formation. Their traditional dresses had strips of white sheets flowing as they danced, representing bird wings. They also brought their traditional farming tools, which are very important for preparing the ground and harvesting potatoes and used by all four communities, and they brought llamas and baskets to carry potatoes (the ‘lead’ llamas were decorated). The criteria for judging the competition included gender and generational diversity, and quality of stories, dances and traditional clothes.

International Day of the Potato — shrines to the potato. Photo credit: Krystyna Swiderska

International Day of the Potato — traditional dance. Photo credit: Krystyna Swiderska

At the time of the exchange, the Potato Park had four community members rather than six; two had dropped out as they were not following the agreed rules (set out in the Potato Park inter-community agreement). The four communities presented their potato ceremonies:

Chawaytire: This is the most ancient community in the park where nomadic ancestors discovered and domesticated potatoes. A community member explained that the long potatoes are male and the round ones are female, and told a story of a marriage ceremony where a female potato did not want to marry a male. He referred to potatoes as his children and used the first person to demonstrate them (suggesting that he/people are potatoes) “I am very good for health, I will make you strong and give you high motivation and energy to work”.

Amaru: This community is from a lower altitude and included a cross in its shrine to the potato, which reflects integration of Christian symbolism into Andean belief systems.

Paru Paru: This is also a very old community. They did a dance dressed as Machus which are pre-Inca ancestors with different traditional dresses.

Pampallaqta: The community procession entered the presentation field in traditional clothing and holding up a decorated cross, which they take to the potato field on 25 December to ward off hail and frost. They put a bed of straw down and piled up their potatoes on top. They poured chicha (a corn-based alcoholic drink) on the potatoes before drinking it themselves. They placed a rope around the potatoes “so the spirit of the potato does not go away” and scattered white flower petals over the potatoes. This ceremony is also a harvest festival and celebration of Corpus Christi.

All of the ceremonies involved prayers thanking the Apus, and asking them for a good harvest, while blowing through coca leaves towards the Apus. Prayers were directed to specific Apus, including the most important Apus of the communities and the Apus for seeds. Other competitions included traditional gastronomy or ‘huatia’ (cooking in temporary earth ovens), and a native potato diversity identification contest. Ealier in May, a poetry contest was organised in collaboration with local schools. The children who won the contest recited their original potato-related poems during the Potato Day celebration.

INMIP exchange opening ceremony

The opening ceremony was held at the pluriversity in Huaran, around a fire built in a firepit shaped as a 'Chakana' — an ancient sacred Andean cross, and important symbol in Inca and pre-Inca societies for thousands of years. The Chakana represents the Southern cross, harmony and the interconnectedness of the universe, and is common to many Indigenous Peoples in the Americas.

A priest from the Q'eros nation, a very spiritual Andean people, said an opening prayer. He called on all mountain gods — Ausangante, Machu Pichu etc. — and said that they all have responsibility to ensure this meeting is successful and give us power to do so. He asked the Apus "to work in cooperation with us like we work in cooperation with the Apus". He also prayed to Pacha Mama: "from the bottom of my heart and for our future, let us trust in Pacha Mama. Pacha Mama, I know you are receiving us with open arms". He added that people have come from far away and "I'm sure Pacha Mama has open arms for you". He blew through coca leaves facing the mountains to communicate with the Apus. The priest then poured chicha (maize wine) on each corner of the Chakana cross. He then asked each person to blow on three coca leaves with two flower petals on top and pray to their mountain god or Pacha Mama while blowing. After everyone had done that, he put the leaves in the fire and said the smoke would take the prayers to the mountain gods.

Alejandro Argumedo, International Coordinator of INMIP, explained the meaning of each corner of the Chakana cross, which represents Andean understanding of space and time, ways of learning, social-ecological systems and legal-normative values that regulate all the other dimensions (see Figure 1). It identifies diverse ways of learning and understanding the world: Yachay means learning with the mind, Ruway means learning by doing, and Munay refers to the ability to think and feel with the heart.

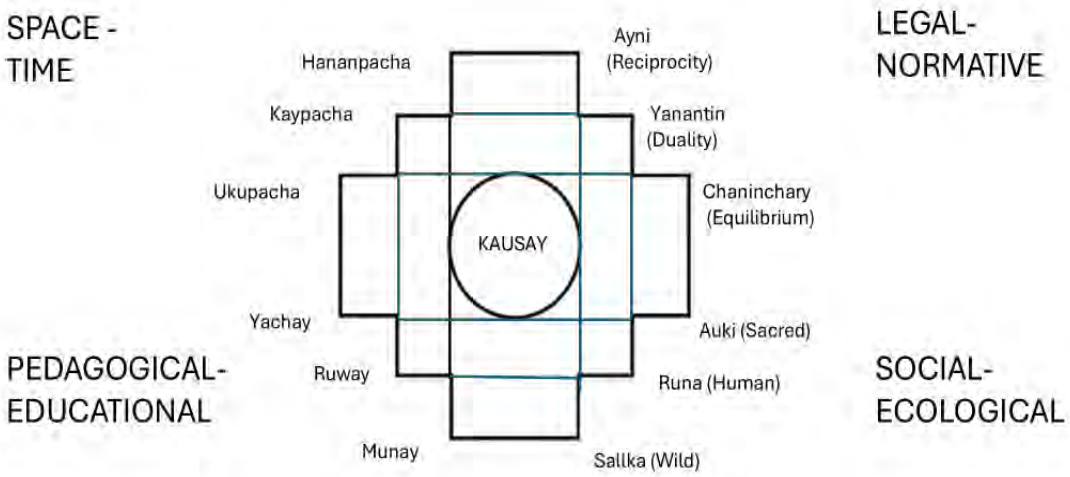

Figure 1: The Chakana Cross: Andean Cosmovision as an educational conceptual framework

Alejandro introduced the objectives of INMIP, the previous learning exchanges, and how this exchange will continue focusing on the key themes of Biocultural Heritage Territories, agrobiodiversity and climate change.

Day 2: Challenges and Biocultural Heritage Territories

The day opened with a keynote address by Bolivia's Minister for Environment and a presentation by IIED to introduce the challenges facing mountain and semi-arid communities and provide background and global context. Participants were then asked to think about the key challenges facing their communities and to group them into five key issues/themes. Each community or country group then prepared a map of their community/territory highlighting those key challenges, and presented their maps in plenary. In the afternoon, ANDES presented the process to create the Potato Park biocultural territory — the methods, tools and processes used based on local Andean knowledge and cosmovision.

Mountain and semi-arid IPs and LCs: Global challenges and resilience

Alan Lisperguer Rosales, Minister of Environment and Water, Bolivia, gave a special greeting to all participants to open "this important event on climate change and Indigenous Peoples of mountain regions". He noted that Bolivia faces similar challenges to Peru. Climate change has impacted water resources and Bolivia is focusing on finding solutions for water security. There has also been an increase in water-borne diseases due to climate change. Bolivia has different Indigenous cultures in the Andes and Amazon regions that are thousands of years old. Bolivia has incorporated a framework of 'Vivir Buen' or 'Living Well' into its constitution and the UN has recognised the importance of the concept within discussions on sustainable development. In Bolivia, this framework promotes participation and the recognition of Indigenous Peoples. The government is working at local, national and international levels to strengthen Indigenous Peoples' participation in policies, and protect the rights of Mother Earth.

Krystyna Swiderska (IIED) introduced the challenges facing mountain and semi-arid communities and the role of IPs and LCs in biodiversity conservation and climate resilience. Mountains provide 60–80% of the world's freshwater — captured and stored in glaciers, rivers, springs, lakes, wetlands and grasslands. They provide water for nearly 1 billion people in mountain areas and billions of people downstream. Major cities like Rio de Janeiro, New York, Nairobi, Tokyo, Lima and La Paz depend almost entirely on freshwater from mountains. Mountains provide at least 70–90% of river flows in semi-arid and arid regions. Mountains are also home to 50% of global biodiversity hotspots and rich cultural diversity. They provide nutritious foods and medicines and economic benefits (for example, 15% of Peru GDP; Dr Leon Morales in Swiderska and INMIP, 2017). Mountains sustain rich agrobiodiversity, including centres of domestication of most of the world's food crops and many livestock species and resilient crop wild relatives, which are vital for adaptation to climate change. Mountains also sustain important ecosystems for climate mitigation: forests, wetlands and grasslands, which store nearly 50% more carbon than forests (IPCC, 2022a).

Mountain Indigenous Peoples play a vital role in conserving mountain water-related ecosystems and agrobiodiversity for climate resilience. They protect water-related ecosystems such as sacred mountains, forests, rivers, lakes, springs through traditional knowledge and spiritual values. Through customary laws, many Indigenous communities manage water equitably and sustainably — for example, ancient Inca terraces with irrigation channels, and customary water management systems in southwest China (Reilley and Swiderska, 2016) — and ensure sustainable use of ecosystems such as forests, wetlands, pastureland and agroecology. Mountain IPs and LCs also conserve resilient ancestral gene pools — crop varieties and livestock breeds that are co-evolving for climate adaptation. According to the IPCC, mountain Indigenous and local knowledge systems strongly support integrated adaptation and mitigation strategies (Alder et al., 2022).

Mountain and semi-arid regions share a number of similarities:

- Both host unique biodiversity and rich cultural heritage, and provide globally valuable ecosystem services, according to the IPCC (Adler et al., 2022; Mirzabaev et al., 2022)
- Both are highly vulnerable to climate change, with temperatures rising faster than the global average, and increased frequency and intensity of drought.

- IPs and LCs in both mountain and semi-arid regions depend on mountains for water and conserve water catchments. For example, Quechua people protect sacred mountains and lakes, and Mijkenda people in Kenya (Rabai) protect sacred Kaya forests (hills) and depend on Taita Hills (mountains) for water.
- Melting glaciers are affecting people in both mountain and semi-arid and dryland regions. Mountains are also semi-arid — for example, the South American Andes are classed as 'arid' by the IPCC (Mirzabaev et al., 2022). Both are very sensitive to changes in rainfall.

Mountain peoples face many impacts from climate change and related loss and damage:

- Rising temperatures are negatively impacting on mountain ecosystem services, agriculture and pastoralism in most regions (Adler et al., 2022). Rising altitudinal ranges are endangering unique biodiversity, native crop varieties and related traditional knowledge (in the Potato Park, for example).
- At least 600 glaciers have disappeared, affecting water supplies for billions of people downstream. Andean glaciers have shrunk by 30% (Swiderska and INMIP, 2017). According to the IPCC, there has been "extensive glacier retreat across the Andes" and Asian glaciers are expected to reduce by 36% by 2100 with a 1.5°C rise, leading to reduced water flows after 2060 and droughts. Furthermore, Mount Kenya's glaciers have decreased by 44% between 2004 and 2016, and are projected to disappear by 2030, while Kilimanjaro and Rwenzoris glaciers are similarly retreating (IPCC, 2022b).
- Disaster risk — including floods, landslides, avalanches, mud and rockslides — is worsening for many mountain communities, often causing loss of life. Unsustainable development, environmental degradation, poverty and food insecurity is also increasing in mountains (UNGA, 2021). Outmigration of youth is undermining traditional knowledge transmission and often increases the burden on older generations, particularly women (Swiderska et al., 2022).

Examples of the role of IPs and LCs in biodiversity conservation and climate resilience include Indigenous water management systems. In the Naxi Stone Village, Yunnan, China, an ancient water management system is sustained, which consists of conserving a sacred forest spring and related rituals; and customary laws for sustainable and equitable use are overseen by a customary water management committee. This ensures fair water allocation to 14 villages in the watershed for drinking, irrigation and fire control, and has prevented water scarcity and conflict despite recurring spring drought for 10 years due to climate change (Swiderska and Reilly, 2016).

In the Eastern Himalayas in northeast India, Lepcha and Limbu communities in the Kalimpong district still revere the sacred Kanchenjunga mountain range, and protect sacred lakes, rivers, forests and caves. They have customary sustainable use regimes for fish and forests. Some springs have been drying up in recent years, but the customary water management system has ensured water supply through irrigation channels for equitable rainwater use, and these are collectively maintained. In the Potato Park and Chalakuy Park Biocultural Heritage Territories in Peru, Quechua communities protect sacred mountains and sacred high-altitude lakes (which are often feared), as well as wetlands and upland grasslands that store water, and rivers and streams.

Challenges facing INMIP communities

Each community (or country) group identified mapped their community or territory and identified key challenges facing them, as follows.

China, Stone Village

There are mountains, a big river (Balsoan river) and terraces surrounding the Stone Village. Below the Stone Village is the Jinsang river. The people live in the area in the middle of landscape. With climate change, they have mudslides and land flows in the mountains around the Stone Village when it rains a lot, and when there is no rain it is very dry in their fields. Another issue is that labour for farming is going to the city. If there are no youth in the village then traditional knowledge is not passed to the next generation. Traditional knowledge about farming is disappearing and no youth speak the Naxi language. There is also a lot of rubbish in Stone Village due to tourism. There is no recycling system and farmers may be barefooted and so it's a problem for them. In the Balsoan river there is water for

irrigation — some flows underground and some is channelled overground. This system has been used for over 1,000 years until now.

Q (Participant from Peru): what kind of crops do you grow there? **A:** Over 100 different types of crops including corn, wheat and vegetables.

Q: How are you organised in the village? **A:** Many traditional crops have disappeared so an NGO and scientists from Guangxi agricultural research institute came and taught farmers how to produce good seeds. Many women are more interested in seeds, so they set up a women's seed group, and also have a women's traditional dancing group.

Q: How do you deal with a lot of rain and mudslides? **A:** Mudslides fall on terraces and break some of the walls. But the community can plant another variety like buckwheat which grows very quickly. Mudslides have also killed people.

Kenya, Rabai community

Abdala Saya, a youth from Rabai explained that they have four sacred Kaya forests which are gazetted, and one main river that divides two Kayas on one side and two on the other. Before the river had water all the time but now it has become seasonal and dry most of the time due to deforestation. A number of other threats affect Kaya forests, such as encroachment into Kaya forest areas and sand mining. Kaya areas are very rich in minerals and are being encroached on as people are acquiring land for mining — this is a major challenge, along with deforestation as people are cutting down trees for fuelwood etc. Previously Kaya forests were treated as sacred areas and no one would go and extract anything from them. But now the situation has changed and more youth are going to the forest to extract due to the loss of traditional knowledge and lack of respect for elders' rules — a lot of destruction is due to that. Modern religion is also a cause of loss of traditional knowledge especially among youth. Urbanisation and industrialisation are a major cause of Kaya forest loss; more people are coming from Mazeras urban area and settling in Rabai and use wood from Kaya forests for construction. Urbanisation is driving a lot of industrial development, which has caused air pollution and many problems for community health.

Q: Who is extracting wood from forests and who allows it to happen? **A:** Most of it is done by the local community, but immigrant people are also doing a lot of extraction in recent years, because when they see the locals extracting they do the same.

Q: How do you see the future of your community when you know that every year there is less water? **A:** The community is optimistic that with lots of restoration in Kaya forests they will be able to restore water catchment areas, but if deforestation continues, the future will not be good. Rehema, a community researcher from Rabai, added that they are reforesting along the river to restore the catchment.

Q: What trees do you conserve? **A:** We restore native trees in Kayas.

Q: Are you using national or international law for Indigenous Peoples to defend your rights against industry? **A**: The existing national laws are not being adhered to and they are not as complete as customary laws — so there is a need to strengthen customary laws.

Peru, Potato Park

Lino Mamani, an Indigenous potato expert explained that his community of Pampallaqta has three small lagoons at 3,200 masl and above, "so most of the park's diversity of potatoes exists in our community". The community is threatened by a pending mining concession. They have six areas with potato fields and wild plants — "we conserve all this". They also have livestock and grow straw. Due to climate change, water is reducing, so they are trying to combat water loss and mining.

The Amaru community has three ecological zones. In the lower zone, they plant cereals. Until 1970–1980 they had glaciers but now they are gone. They aim to maintain potato diversity and traditional knowledge. They do not want mining concessions because they continue to conserve, to respect their agriculture and mountain gods, and to transmit their traditional knowledge to their kids — "but if we don't transmit it there will be mining and GMOs".

The Potato Park communities continue their traditional customs. For instance, in January they do 'linderaje', a territorial boundary festival where they meet neighbouring communities and confirm the boundaries of each community. At the same time, they check for any changes or encroachment on their

territories. They hold a celebration of their patron saint in September and get visits from other communities, such as Pisaq, Coya and Lamay. They continue to cultivate and intend to leave their farming systems to their children, who also need to cultivate. “We keep our customs and show them to tourists. So we work in the Potato Park. Thank god we don’t yet have mining”.

The Potato Park is recognised as an Agrobiodiversity Zone. They continue to use traditional tools in sloping areas, and some machinery is used in flatter areas. Many youths are migrating but they transmit traditional knowledge during community meetings. During COVID-19 many youths migrated to cities but they saw that people had little food (unlike in the Potato Park).

Q: What area does each farmer have to farm? **A:** About 0.25–0.5 ha, up to 2 ha (1 ha = 100 m^2). We don’t cultivate all land all year, we rotate. We leave fallow areas where animals graze, so the land can recover before planting again.

Q: Is each farming field owned privately? **A:** Land is community owned so each piece of farmland is used by a household but owned by the community and is subject to customary laws.

Q: How much mining is there? **A:** We are planting and building in the area under mining concession to try to prevent development of mining in the area. And we use the law on Agrobiodiversity Zones and International Labour Organization Convention 169 and are changing our community’s constitution to prevent mining.

They don’t want mining because with climate change, they may not have water and they won’t be able to plant potatoes or have grazing land. They don’t know what people want to mine. Copper is one thing that is lucrative at the moment.

“As we are a Potato Park, we organise ourselves and we protest — we go to Lima. If we are not organised, anyone can come onto our land. So that is why we are conserving, as this is the centre of origin of potatoes. We still need to change our internal statutes of the community. So that’s why we are still linked to Asociacion ANDES — recently they found out that genetically modified crops may come here”.

Q (Asha, Kenya): I noted a lot of emphasis on traditional knowledge transfer to young children from parents — so I am wondering if the children go to school, and what time do you transfer traditional knowledge to kids? In Kenya kids spend a lot of time in schools and then go to boarding school so there is very little time for traditional knowledge transfer. **A:** In the Potato Park they have classes in Quechua — if we don’t teach our traditional knowledge to kids they will lose it, we always show kids from the household how we sow the field, how to manage the land, the rules to look after the land, and how we don’t kill wild animals. We bring the kids to the fields so they learn by seeing what we do.

Peru, Q’eros community, Cusco

“We are from Paucartambo — one district has 46 communities and the other has 48 communities. Our territory is between the highlands and rainforest. We have over 11,500 ha and it is on the edge of the rainforest. We are conserving it and do water sowing and harvesting, through reforestation and conservation efforts by the community, and we think this will help us have more water for the future. Mining is affecting us in this entire province. This river has a mine next to it, and we have informal mining. The local government has tried to denounce some of these operations but the whole region is affected by mining especially informal mining. It affects our farms and contaminates the water a lot. We get illnesses and it’s quite difficult for us to organise around this. We’re looking for ideas on what to do about these issues. This river belongs to the state and now they are not letting us manage it. And there is a National Park here, Manu National Park and the use of livestock like cows is also putting a lot of pressure on this area. Farmers are using a lot of chemicals and some want to adopt genetically modified (GM) crops.

“These are our sacred mountains and here we cultivate our crops, in this area it is higher up and we don’t have informal mining yet. We have 600 inhabitants and we also have very different agricultural zones from the lowlands to the mid-altitude to the highlands. We are very worried about climate change and mining. The trout are getting sick and we’re seeing a lot of change in the snow peaks and glaciers, and if we have mining we have less pastureland.

“We maintain our customs and culture in our Q’eros community. Paucartambo was a bigger area and was all just one community. Now there are separate communities — Q’eros and others. We grow a lot

of potato diversity, tubers, barley and wheat at different altitudes. We practice reciprocity, collective work and rotational farming systems — these are traditional practices that our grandfathers taught us. After cultivating the crops we get pests, so we do crop rotation to control pests and diseases or 'muyi' — one year we cultivate in one place and then move and leave it for 5–6 years to rest, so that keeps our crops healthy. When potatoes grow at higher altitudes they are more nutritious than at lower altitudes. In the lowland area they do artisanal mining but the whole area is under a foreign mining concession. The youth are leaving the community in great numbers as there is not really a market for native potatoes. Prices are very low so they can't live from that and they want an easier way to make money. If they try to grow crops organically it's a lot of work so young people are going into mining, so we're looking for alternatives for youth so they can stay in the communities. We don't hunt wild animals."

Peru group work at the Pluriversity. Photo credit: Paola Andre Luna Veizaga

Peru, Chalakuy (Barter) Maize Park

"We are four Quechua communities in Lares. Our mountain glaciers are disappearing and the water in lakes is reducing. These glaciers used to be very big but now with climate change we have to use some irrigation. Our glacier used to be much bigger. We've started to build dams to hold the water, because our water is lost every day and we'd like to control the water flow for our plants and animals. We rotate our crops — the soil needs to rest for seven years, so we use the land as pasture, and after seven years we come back and work that same piece of land. In the upper zone we grow potatoes, in the middle zone we grow corn and beans and when we meet together we do bartering of products grown at different altitudes — we trade our potatoes and corn for fruit. Without barter we don't have good nutrition. We also take care of animals. We don't use any chemicals for our animals. We used to use medicinal plants to heal ourselves in the past, and we are trying to transmit traditional knowledge. Now the youth and students are no longer using traditional dress so we'd like to transmit our traditional knowledge and customs."

Peru civil society organisations: Apurimac, Cusco, Arequipa

Centro Bartolome de las Casas (a research centre), Asociacion ANPE (National Association of Ecological Producers of Peru) and Geoyachak a local NGO from Apurimac region (Andes), provided an overview of challenges facing communities in Peru. One problem that reoccurs is the water issue — this affects crop productivity. Another problem is extractivism, which leads to conflicts with communities, causes pollution and impacts on human rights. The national government of Peru promotes extractivism — people are given tax breaks, and education is also oriented towards extractivism. And many youth are not interested in traditional knowledge and are only interested in social media.

Maria Eugenia (Arequipa): In lower areas communities farm, and everything that is done at higher altitudes affects this. In the river there is a lot of sand extraction for building and many fish species have died because of the machinery etc. Young people leave their community and come back with views that see farmers' fields as production plots rather than areas for conservation. Mining in high mountains is affecting biodiversity. Informal mining in rivers uses a lot of chemicals.

Q: Are mining benefits shared? **A:** In formal mining by big transnational corporations most of the benefits go out of the country (for example, copper, silver and gold). Royalties go to the national government, to the district where the mine is and to universities but they are badly managed. In informal mining the communities sell the minerals themselves, but that is the minority of mining. There is very unequal power between transnational corporations and communities, and unequal benefits — communities get very little of the overall profits. Mining generates inequality in communities between those that work for the mining company and those that don't. It also changes the collective ways of working they had before, such as bartering and reciprocity. So although some people benefit, overall communities don't benefit because mining creates problems.

Bolivia

"Bolivia was declared in 2009 as a pluriversal state. It has Quechua and many other cultures. We are from the department (that is, region) of Santa Cruz. There is the Amboro National Park, which is rich in biodiversity and provides water to downstream cities. Our municipality, Amaipata, has three districts, and 85% of it is comprised of protected areas. We call Amboro National Park the big lung of our country. The valley zone (lowland) is the only part that is not a National Park and is where communities produce most of our food, including citrus fruits and livestock. Our economy as a municipality depends 50% on tourism and 50% on agriculture. A big challenge is how to marry the two, for example, through biocultural tourism."

One community member said: "because of climate change we need to practice agroecology — before our forefathers were traditional, they didn't use chemicals. We're very worried about climate change. As farmers we are living with the effects of climate change — we no longer have four clear seasons. So we need to think about how to stop that contamination to help future generations. We have a law that regulates agricultural production, which has helped us to confront big agricultural producers."

Establishing Biocultural Heritage Territories: ANDES and the Potato Park

Alejandro Argumedo explained the role of communities and organisations that support Biocultural Heritage Territories. "ANDES works with communities with an understanding of power and colonial legacies, for example, science has colonial origins. We see how communities continue innovating — people don't always see that because they are working in a scientific framework. ANDES works with a focus on rural communities and cultural values, and a strong focus on IPs' rights. In NGOs and research organisations that work with communities, the experience of their staff is very important, how their journey has allowed them to understand other realities. That is our reality — from the start we wanted to learn from other experiences including at international level on issues relating to the rights of communities. So that allowed us to support processes that have confluence with the dynamics of communities. Before 2000, with the Potato Park communities we were reflecting on what conservation means, especially wildlife conservation, as we had been to an international conference on protected areas or 'parks' in Durban (2003). We wondered why there are parks for elephants, tigers and so on, but nothing for cultivated species. And why are they called 'Parks'? At same time a debate opened on the role of agriculture in protected areas.

"So we then asked ourselves how to make this Potato Park a reality. At the time there were conflicts between the Potato Park communities, they did not always get on well, even though they are all part of the same mini-watershed. So, what remained was to find a methodology to address the conflict that existed. That was done through the stories that the farmers were telling especially those with more experience with potatoes. They remembered that in the 1970s, potatoes were collected from the communities. We did an assessment of potato diversity from the perspective of communities, how they conceptualised that diversity; we were not really interested in having a metric based on science. We realised that the diversity had reduced compared to previous studies. So we had the idea that we should recuperate the biodiversity of potatoes. Being involved in the Biodiversity Convention and debates on access to genetic resources and benefit sharing and prior informed consent, we realised that we should go to CIP not only to bring back the potato varieties that had been collected from the Potato Park communities but to bring them back with rights.

"So in 2004, about three buses of communities went to CIP and asked for the potatoes to be returned. And then the potatoes were returned through a repatriation agreement in December 2004, after about five years of negotiation with CIP led by ANDES (with IIED support). And we worked with IIED/Krystyna

and developed the concept of 'biocultural heritage' in 2005. At the same time, given widespread racism and national economic policies, we realised that there was a push to erode the rights of communities and communal systems. The Potato Park was not recognised by the state, and was much better recognised outside Peru, for example in the FAO Treaty, the Biodiversity Convention, World Intellectual Property Organisation (WIPO) and UNESCO. And every time the UN mentioned the Potato Park, the state tried to intervene through INIA (national institute for agricultural research). We had to resist strongly to assert autonomy and celebrate the diversity of potatoes — we call that a Biocultural Heritage Territory.

"But over the years, attempts arose to establish mining concessions in the Potato Park. So we started thinking about what government instruments could be used to defend the Potato Park communities from mining. In 2016 a law on Agrobiodiversity Zones was introduced that aims to protect areas with a high expression of agrobiodiversity. It was inspired by the Potato Park, as many of the elements reflect the Potato Park. The Potato Park communities decided to apply to be recognised as an Agrobiodiversity Zone as a tool to defend their land against mining. The park communities had already been self-recognised as a Biocultural Heritage Territory as an expression of autonomy and self-determination. They already had collective enterprises, a committee that is elected to direct the activities of the park, and an economy that generates income which gets shared annually. They didn't want to change any of those achievements.

"To register the Potato Park as an Agrobiodiversity Zone, the first step was to document the rights of the Potato Park communities to occupy the territory. In each of the community's land titles there is reference to the historical occupation of the community in the territory. We also documented the role of traditional institutions, for example, in the distribution and use of water and in the administration of communal spaces and crops (these are not necessarily documented but are important for communities). Then we prepared maps to better understand the characteristics of the territory — biodiversity, crops, water, wildlife, and monetary and non-monetary economy. For example, in Lares barter markets involving exchanges between elevations are very important for nutrition — higher altitudes provide carbohydrates, mid-altitudes provide protein, and lower altitudes provide vitamins. Without such barter exchange it would be difficult for communities to live well and survive.

"There is also a need to document traditional taxonomic systems and how crops are organised in farmers' fields, as these respond to cultural rather than scientific logic — for example, farmers plant a certain black potato called sua manchachi on the edge of the field to act as a guardian. It alerts the other potatoes if there is any animal that wants to enter the field, and lets the farmer know there is an intruder.

"At the same time this work has helped to create an agenda for local research — for example, the community potato experts plant potato transects at different elevations each year to monitor how potatoes are moving up in altitude with rising temperatures. Mapping by a student from the US also enabled them to identify crop wild relative (CWR) locations. The communities also assess the level of potato diversity in the park annually.

"Analysis of the links between customary laws and national and international laws was very important to find frameworks for the protection of rights. Communication is another element that has not always been strong — how to communicate via internet and other ways. We chose to participate in international spaces where recognition of what a community does can be a lot stronger than at a more local level and can create more interest. So that was a way to protect rights in a relational way — we've been active in different forums for environmental law and agriculture, and that acts as a 'boomerang' and increases recognition of the Potato Park in Peru.

"It is very important to work with organisations that show solidarity with communities. In the Potato Park we used a strategy where the benefits that come should benefit all the communities, not just one. So you will see a native potato interpretation centre, a community seed bank, a restaurant and a medicinal plant processing centre. All of this infrastructure is not owned by the community in which it resides, rather it is owned by the whole Potato Park. So if one community pulls out of the Potato Park association, the infrastructure is still owned by all the Potato Park communities. Ten per cent of all income generated through sales of products and services goes into a community fund (that is, 10% of craft sales or tourism income). This system of benefit sharing is based on customary laws. Part of the community fund goes to maintain the park's infrastructure, part to the administration, and part for the

annual Potato Park celebrations on the Day of the Potato. The rest is shared equitably among the participating communities every year based on criteria developed by the community leaders. The criteria can include work in biodiversity and landscape conservation, participation in training and numbers of members participating in Park activities.

“So, to establish a biocultural territory, there is a need for a solid documentation of the rights of communities that exist, their governance systems and agrobiodiversity from the perspective of communities. And communities should develop a management plan based on their own traditional knowledge and way of organising their space.”

Questions and answers (Q & A)

Q: How are benefits shared — are they based on the number of residents? **A:** There is an inter-community agreement based on customary laws and concepts of equity and redistribution that exist in the communities. These were used to develop an agreement for equitable benefit-sharing. Depending on the year the criteria can change for distribution of benefits —for example, based on which community participates most in maintaining routes for tourism.

Lino: For example, if we have 1,000 soles in the communal fund, there are special meetings of the Potato Park Assembly to decide on criteria for sharing the funds. Each economic collective is made up of members of different communities – they are elected by their community assembly, and the members rotate.

Q: What is the legal status of the Potato Park? **A:** It is legally registered as an Agrobiodiversity Zone — but this only includes four communities as one community didn’t have the papers needed. We looked for policies and laws that recognise traditional forms of governance and Indigenous territoriality, because the pre-hispanic communal systems were destroyed by colonisation, and in the 1960–70s, with national land reform, the communities were re-established as Ayllus (that is, communities). The ‘Ayllu’ concept in Indigenous communities in Peru continues to be interpreted differently to how anthropologists or archaeologists interpret it (which is often a limited view of communities of people). For communities it is about the wild, human and sacred communities being in balance — they live together ‘conviven’. The sacred Ayllu lives together with the other two Ayllus and has influence over them.

Q: Is the farm produce sold in the market? **A:** There is some commercialisation but potatoes are largely for subsistence. The limit is geological and biological because of the mountain — so farmers’ fields are small. We looked at what niches of specialisation can generate local economy that is controlled by communities, for example new types of products like potato shampoo. We use knowledge that exists in the community to develop value-added products. Some potatoes can be sold as nutraceuticals because of high antioxidant content. We are developing a community seed enterprise so the communities can market potato seeds to cover the costs of conservation, and continue doing non-monetary exchanges. They can do seed marketing and benefit surrounding communities by providing locally adapted and resilient varieties.

Q (Omari, Kaya elder, Kenya): What challenges have you encountered in establishing and operationalising the Potato Park as a Biocultural Heritage Territory? **A:** There are two types of challenges that are typical for this type of initiative:

1) Challenges to do with relationships between communities: for example, some individuals reject the idea of mining as a potential source of ‘development’ and that can generate conflict in communities. When people see that communal organisation impedes them they say they want to leave the Potato Park because it gets in the way of their own interests. External religions also create different types of narratives to traditional beliefs and that can weaken traditional beliefs. Also, some religions do not allow community members to practice traditional rituals and ceremonies, which weakens community bonds.
2) External challenges: orientation towards individualism affects the possibility to generate community processes that are more based on traditional norms. Social media also means less connection with that world and creates another reality, which is artificial, so our connections with traditions get weakened. Competition between communities for certain types of benefits is also a hindrance. But they are communities with strong cultural identity, which is critical for the initiative to prosper. Externally there are laws that weaken community organisations. For example, there is no law that allows communities to use their own customary laws or traditional knowledge to create a school — it all has to be within the colonial framework.

Q: How did you strengthen cultural identity — what processes, methods and tools did you use? **A:** Building strong self-esteem in the Potato Park was helped by the fact that we at ANDES identify as Indigenous — so the struggle is to maintain our culture and biocultural heritage. Biocultural heritage in this country and region has a history linked to achievements that are globally recognised, such as Machu Picchu and Sacsayhuaman, but today that is often denied and we are focused on colonial cultures and call Spain the 'motherland'. At same time there was a science behind those achievements — not only of the Incas but of the many other cultures that preceded the Incas. So we thought, why do we need to look for conservation methods and so on in books on conservation when we already have that knowledge? That's why the Potato Park uses the Ayllu system — it has the economic (human) aspect and the sacred side to find norms that support the wild. We already had this as it is ancestral. But to strengthen it you need tools — for example, we have the 'yupana' matrix that we can use to do different types of metric analysis. So by recognising what local people know you can build strong self-esteem. You will see tomorrow the people are proud of their work. That agriculture started 8,000 years ago, without external interference. We have the knowledge, but that doesn't mean we negate western science. We are working with an organisation called Geo which is developing AI systems. The Chakana cross provides the basis for a relational database that can be used for administration of Biocultural Heritage Territories. So we can use our own Andean cosmology to organise our territory.

How AI can support Biocultural Heritage Territories

Pedro Zeas of Gearth, Ecuador, discussed how AI can support Biocultural Heritage Territories: "The Ayllu concept and Chakana provides the basis to construct systems of territoriality. I am an architect and in last 20 years I have been working to organise traditional knowledge and territoriality. Recently we've been thinking about how to use AI to support territoriality. We've been working with five community territories in Ecuador and putting together models based on traditional knowledge for use of the territory. We used to keep this information manually but AI allows us to look at the use of space in Indigenous territorialities and mestizo or mixed territorialities. First we look at the characteristics of any culture — each culture has its own way of seeing reality. Everything is very complex in our territorial systems. We are looking at referential systems, so when one looks at reality using your culture, science, art and spirituality, each culture and person has a different way of seeing these links, and you see things in space and time so reality is situated in these. So it's a complex adaptive system and each one of us sees reality in a different way based on our different cultures. The AI system helps us to see this reality. For example, we've used drones to produce different types of maps. These intelligent systems are really just new tools — the perceptions and ways of seeing are still ours.

There are four dimensions to territorial systems — energy, materials, knowledge and information — since the big bang. Each of these varies over time and has been built up for thousands of years. Diversities are natural, spatial, cultural, social — all these interactions create diversity and complexity that make up biocultural spaces whose function is development. There are several dimensions of territorial reality — nature, culture, economy, policy and digital, and the constructed. To understand these, you choose a sub-system you want to look at.

Territorialities include territory, territorialisation, de-territorialisation, re-territorialisation and intercultural territoriality. Each of these are points of a connected star shape. There has been a lot of migration of communities out of territories. There is the common good, or common goods and 'el sentido comun radical' — a radical approach to common good. There are different ways to look at usefulness or utility of the concept — as art, aesthetics, science, art, spirituality and so on.

Gearth is an AI system that introduces a distinction in reality — it is a toolkit to understand reality, or it can be a database that can serve different users, or a system of indicators to assess changes in reality. You can feed in principles, laws and theories. This model is meant to be used to address problems. The system gives information and knowledge to help address problems and can mobilise groups to help promote change. It is also a tool to gather information from secondary sources like books or articles. And a tool to discuss problems with others to look for solutions.

With the confederation of IPs of Ecuador we're developing a project on how to manage resources in Indigenous territories, and whether it is sustainable, and creates capital and memory of nature and human relations — memories and traditional knowledge of history stretch back over thousands of years. But the system needs to be managed. Everything is in a language that is easy to understand so you can access the toolbox, enter information and build the database. We can collaborate and develop

information about Indigenous territories. We have this infrastructure already in place and have applied for funding, and it is nearly ready to launch.

Q & A

Q: What is territoriality? **A:** We understand it as the interaction between people, the collective, the culture and the territory that creates different ways of understanding territory. Here in Ecuador we are looking at different types of territory. Where I come from territoriality is linked to my neighbourhood, it is an Indigenous community, the land, food, crops, and the culture of that land that is important. The culture helps inform the use of the land. And of course the capital city is taking more and more space so it absorbs territory — so the city changes the land and the culture. See the Gearth website for more information.

Discussion: Can these computerised systems help us?

Lino (Potato Park): For me it's very important to document everything we see in our territory.

Alejandro (ANDES/INMIP): If you have problems with youth interested in mining, would these kinds of tools help to engage them in protecting the territory?

Q'eros community member: Yes we feel they can be useful. Are you planning to use this in the Potato Park? ANDES is working with Pedro to do something smaller scale.

Chemuku (KEFRI): I think this AI tool could help for documentation to create a repository of traditional knowledge and for sharing between communities — especially if it is on smart phones.

China participant: I'm not sure if the AI tool is useful for farmers as they may not know how to use it. It's a bit complicated, so someone would have to show us how to use it.

Leila (KEFRI): it could be useful in the case of Kenya to attract youth to come on board. How are issues of intellectual property rights being taken on board?

Alejandro: when Pedro shows the complexity of inter-relationships it looks complex, so simplicity is key. Regarding intellectual property rights, the system works with what is already in the public domain. Tools for AI are public domain. But there is nothing out there that is protecting traditional knowledge that is in public domain.

Krystyna (IIED): I can see that AI tools are good to engage youth, to provide visual tools for transmitting traditional knowledge and for compiling community databases. But this has already done in the Potato Park and Lares without AI, so what does AI add? Is it something to do with inter-relationships of complex systems?

Alejandro: AI could be useful for managers of territories to manage a lot of information, which already exists on the internet. With AI you can very quickly gather information and create huge databases, by searching through published and grey literature. But it uses immense energy and contributes to climate change. I think the theoretical basis presented is useful for managing territories as complex systems. What AI adds is that you can use a multiplicity of data — so if a community faces risks from mining for example, it could use AI to gather information to help avoid any impact on the community.

Q'eros community member: I think there are advantages and disadvantages. I agree with our China colleague — I think systematising a lot of information can be a bit difficult with Andean systems — the system is a bit like a spider web. The information for the AI tool comes from the internet not from the community.

Day 3: Potato Park visit

Participants visited different communities in the Potato Park, where Indigenous technical experts and community members presented the work of the park, including the conceptual model and governance system, the genetic reserve of wild potatoes, the plant breeding and repatriation centre, the agricultural calendar and community seed bank, and the park's solidarity economy, biocultural products and benefit sharing. Participants were welcomed with flower petals and traditional music to a beautiful viewing spot overlooking the Potato Park. Mariano reached out to the sacred mountains with a ceremony involving blowing coca leaves. He asked the mountains for a successful workshop: "we have three sacred mountains here, they are looking over us today and we will reach out to them".

Map of the Potato Park at an entrance to the park. Photo credit: Krystyna Swiderska

Introduction to the conceptual model of the Potato Park (Amaru community)

Aniceto (a Potato Park technical expert) introduced the parks' collective self-governance model, with a three-dimensional model of the Potato Park, where each piece represents a community. The Potato Park has a total of 9,280 hectares (ha), 6 communities (now 5) and a population of 7,400 people. It has three ecological zones: a lower part where beans, quinoa, barley and wheat are grown; a middle zone where Andean tubers and crops like oca, mashua and olluco are grown; and a higher altitude zone where native potatoes are grown. Aniceto explained that the Potato Park does not only have potatoes: "it is an Indigenous Biocultural Heritage Territory, where we have traditional knowledge, traditional music, wildlife, sacred mountains and the landscape itself — all this makes up the Potato Park but the potato is the flagship".

The parks' governing council ('consejo directivo') is made up of the Indigenous Presidents of each community who are elected by the community every two years. They are people with good traditional knowledge and good behaviour. The Presidents elect the President of the Potato Park every two years. The President of the Potato Park has to look out for the park, decide how to organise the economic collectives, potato conservation and participation in festivals, and takes the lead when there are strikes.

The governing council manages the whole Park based on the Potato Park's inter-community agreement. This sets out the duties, rights and functions of the Potato Park, its different activities and how different communities will participate in different activities. The Potato Park has an administrator and a communal fund, which receives 10% of the revenues from each of the Potato Park's economic collectives, and also receives donations and entry fees. Adventurers, scientists, students, chefs and professionals from different countries visit the park and pay entry fees. "The Potato Park for us is a university where we teach on traditional knowledge, wisdom, agriculture and climate change", Aniceto added. At the end of each year, the communal funding is divided among communities according to the decision of the governing council — "whoever works the hardest gets the most".

Potato Park governance and organisation

The governing council of the Potato Park includes the Apus and the local technical experts (técnicos locales), who work in coordination with the Assembly and Presidents of each community. "The role of the técnicos locales is to share traditional knowledge with visitors and do conservation and do the work of the Potato Park" (see poster of the governance and organisation of the Potato Park).

The park's administrator manages the funds from visitors and from six economic collectives: the medicinal plants collective makes biocultural products like shampoos and herbal teas and is based in Sacaca community; the women's gastronomy collective prepares different dishes based on local food for visitors; the local guides group is composed of youth guides (for example, for trekking); the 'artesania' or crafts group has a textile production centre; the potato guardians group leads on potato conservation and the community seed bank; and the rural tourism group leads on homestays.

Sumaq Kausay and Ayllu

The governance of the park is based on the Andean 'Ayllu' concept. As Aniceto explained "for many years, our ancestors were guided by the Ayllu concept, which sets out how we live together — there is a relationship of reciprocity between humans and nature". He explained that the world is divided into three Ayllus or communities — the human, the wild and the sacred, which have to be in balance to achieve holistic wellbeing or Sumaq Kausay (Buen Vivir) (see photo). Salqa Ayllu includes wildlife indicators and astronomical indicators. Auki Ayllu includes the main Apus (mountain gods) of the government, the Apus that are council members, another Apus that is female, and the most powerful Apus that rules over the other Apus and everything (a large mountain, see photo below). "From the Apus are born the customary laws. They are the spiritual and sacred zone." Duality, reciprocity and solidarity

are important customary laws. Runa Ayllu includes community assemblies, economic collectives, domesticated animals and plants, festivals and all human activities.

“How between the three communities do we relate to achieve Sumaq Kausay? In potato cultivation, for example, we first need to get support from the Apus — we offer them chicha (maize wine) and coca leaves to get good production and protection of our agriculture. We also nurture our wild areas and use animal indicators and stars, for example, to know if we should do early or late sowing, or if we will have a good harvest. Thanks to traditional knowledge we know how to interpret these indicators. There always needs to be duality, solidarity and reciprocity between the three Ayllus. The fundamental basis for the three Ayllus is Mother Earth — nothing else exists (including humans) without her. However, sometimes our government authorities don’t understand our Ayllus — if they did we would not have the threat of mining that destroys water.

“The Potato Park started in 1998, but it didn’t happen overnight — uniting six communities with one inter-community agreement is difficult. It took 5–6 years and a lot of time and workshops to raise awareness and build capacity. It is difficult to manage so many people. But within the communities there have been quite a few changes and achievements — we have registered the Potato Park as an Agrobiodiversity Zone, fought against GMOs, and strengthened traditional and cultural diversity.”

Apus (mountain gods) in the Potato Park. Photo credit: Krystyna Swiderska

Q & A

Q (Participant from Rabai, Kenya): Where do you bury your dead, in sacred places or homesteads? **A:** Each community in the Potato Park has a cemetery. But leaders and wise people are buried closer to sacred places.

Q (Participant from Rabai, Kenya): Are there people in the park who are Christian? How do you maintain traditional culture? **A:** There are some Christians in our communities but all the traditional beliefs and traditions are respected by them and they still participate in traditional activities.

Q: How do you deal with conflicts? **A:** In communities, we have our regulations and statutes for dealing with conflicts. Between communities there are mainly territorial conflicts but we have maps that show community boundaries. We use customary laws.

Q: Do you need a special priest to do a ceremony or can anyone do it? **A:** My father taught me how to blow coca leaves to offer respect to the Apus, you have to do it carefully and slowly. We don't need a special priest to blow coca leaves. But to do an offering you have to have an Andean priest/wiseman — we have three or four in each community. The offering is prepared in August — it involves burning something at midnight, for the mountains and Pacha Mama (Mother Earth), otherwise they can punish us.

Q (Q'eros community member, Peru): How can communities join the Potato Park? **A:** Your community is far away but you can establish your own Biocultural Heritage Territory — we serve as a model.

Q: What was the process to develop the inter-community agreement? **A:** We had 8–10 meetings at community level each year, focus groups and inter-community meetings — we had many meetings.

Potato wild relatives around a high-altitude lake (Paru Paru community)

Participants walked to the far side of the Azul Cocha or 'Blue Lake'. Aniceto explained that the Potato Park has three species of wild potato — Acaule, Raphanifolium and Bukasovii. A study was done a few years ago that mapped the wild potatoes of the park and identified the areas with the highest concentration of potato wild relatives. Aniceto explained that "Acuspaya is the grandfather of the species we use for moraya freeze dried potatoes, and this is the native potato which is the child. We have different varieties which are sons of the Acaule family of potatoes. We have a potato wild relative variety called Yana Pitikina. Acaule is more resistant to climate change- to drought and everything and is good for making moraya." In January–March the area on the far side of the lake (see photo below) was covered in wild potatoes. Aniceto added "thanks to these potato wild relatives we have many varieties of potato. And thanks to these wild relatives, plant breeders can make improved varieties". He uprooted a wild potato plant to show the grape-sized round white tubers.

INMIP participants visit a high altitude lake with potato wild relatives. Photo credit: Krystyna Swiderska

The Potato Park experts explained that 8,000 years ago these potato wild relatives grew further down but they are also rising in altitude due to climate change, like domesticated potatoes (due to increased temperatures and soil pests), “so we are working to protect these crop wild relatives”. They explained that “previously our ancestors used the leaves of potato wild relatives to put in soup. They are medicinal and were also cut and put on injuries”. The wild potatoes used to enrich cultivated crops through wind pollination and through livestock. The communities don’t sow or harvest wild potatoes, they just protect them. “If mining is allowed, it will destroy the wild relatives we conserve.”

Ricardina, a Potato Park expert, explained that climate change is favourable for some other crops but not for native potatoes, which have moved up 200 metres and get many pests. “So we installed research transects every 100 metres, first with 17 varieties, to see which are most resistant. We found that in the first transect at 3,950 metres there are too many pests, and in the second there is also not much productivity and hardly anything for seeds, but the third, fourth and fifth transects were better, and a bit higher it was not so good. Now we are at the top of the land where we can plant so we are trying to identify varieties that can grow lower down. We use yellow stick pest traps and traps with detergent. Even with climate change, we know to plant on the left or right side of the valley, we know where the frost is going to fall. We always plant a mixture of potatoes not just one variety and plant at different levels so that some will survive — we learnt that from our ancestors.” She added “but at global level they are causing climate change and they are doing nothing, and we doing so much conservation, even if laws are against us. When mining comes, our animals reduce because it affects pasture and agriculture. But we always continue fighting. We look after our crops and animals”.

Lino Mamani (a Potato Park expert) added “We have early planting, mid planting and late planting — it is important to do all three stages for climate change adaptation. Wheat is also moving in up in altitude due to climate change.”

Q & A

Q: Has an academy helped you know how to improve the potatoes? **A:** Researchers from the US came and put their names on the potatoes. Our ancestors always did improvement, for example, crop rotation, and taking seeds to different altitudes, and they knew how to do positive selection. So we already know how to improve potatoes. Now science is recognising our knowledge better because when they do potato transects in the park, they can’t do it alone, so we always do it together, linking traditional knowledge and science. For crop wild relatives we did research with a US researcher who mapped crop wild relatives in the park.

Q: During a visit in 2017, I learnt that planting potatoes next to wild relatives that spring up in animal corrals is a traditional practice that was used to enrich cultivated potatoes? **A:** We don’t cross crop wild relatives with native potatoes, but wind, insects and animals cross-pollinate them. We take the crop wild relatives from the corral to the fields and plant them near cultivated crops, and the wind etc. pollinates them and produces new varieties.

Q: What kinds of stories/myths do you have associated with native potatoes, because they play an important role in the management of diversity? **A:** Yes our stories and legends are useful for managing potatoes. We have documented them and we have been documenting the varieties in the Potato Park and our stories to be able to share them. For example, one potato is named after an owl and one is the shape of an alpaca’s nose, and another is called the potato that makes the daughter-in-law cry — we give brides-to-be that potato as a test and if she peels it well, she passes the test and can get married.

Crafts collective and centre, Pampallaqta community

Community experts demonstrated how wool is taken from a live llama for weaving using a knife. Before doing any work, “we need to ask permission from the mountain gods; we ask with coca leaves and blowing on them, and then give a few leaves to the llama” (that is, put them in their mouth).

Paulina, a member of the crafts collective, explained that they use a special plant to wash the llama wool called sacha parakaya: “we usually use the leaves but it is the dry season so we use the roots now, it makes a lot of foam, we use it to wash hair and we have no white hair, it is better than soap or detergent”. Then they spin the wool to make long threads for weaving or knitting. They use a mineral from a rock to dye the wool, a flower for yellow, and another plant for green. They use a eucalyptus plant to get blue/green and it is also used for medicine when they have colds. ‘Barba de la roca’ or

lichen is used as a brown dye, and an insect cochinilla (cochineal) is used to get several colours — maroon, or mixed with lemon to get red, or mixed with a stone to get pink. If textiles are boiled for a long time, the colour stays strong when they are washed. They use sheep, llama and alpaca wool.

Another woman in the group (weaving is mainly done by women), explained how they produce different designs by weaving together or using poles (one end is attached to the pole and the other goes around the weaver's waist) and using bones as tools for weaving. The designs and iconography depict all nature and landscapes in the Potato Park — birds, pumas, spiders, snakes, wallata (an Andean goose), lizards, and mice. Women also knit hats and scarves, among other things.

Traditional weaving in the Potato Park. Photo credit: Krystyna Swiderska

Community seed bank, Pampallaqta

Lino Mamani (a technical expert, potato guardians group) explained that the Potato Park is not for mass production of potatoes but aims to conserve the diversity of native potatoes for climate change adaptation and food sovereignty, "so that we don't loose seeds due to climate change". The Potato Park conserves many varieties and related traditional knowledge. The community seed bank has a semi-traditional construction, using local materials and the temperature is kept cool using water on the ground and low windows for airflow, not electricity. The World Bank funded its construction.

The community seed bank does not aim to make money. The potato guardians group members are not the owners of native potatoes "we are all the owners — everyone who conserves potatoes; we are conserving them for the future". Red potatoes are medicinal and grow at higher altitudes. The seeds last for two years in the seed bank. When potatoes are wrinkled they do not grow so well. The water is changed every 15 days as otherwise it can get fungi. When they started they collected 718 varieties from the Potato Park communities (according to traditional classification). The potato guardians plant the different varieties in each community and select the best seeds to replenish the potatoes in the seed bank after two years. As Lino explained "after multiplying the seeds we distribute them to all families in the Potato Park".

Asociation ANDES provides a bit of funding to support their work — a 'propina' (tip) — because now they need money, whereas 50 years ago they didn't need it. They are setting up a community seed enterprise so they can sustain their work and the community seed bank and cover the running costs

(not to maximise profits), by selling quality seeds outside the Potato Park. “Most of our potatoes are frost resistant and resistant to diseases such as rancha (blight), but there is not much rancha in the Potato Park. If they get grubs/maggots, you have to remove the leaves when they are discoloured before they lay eggs. We need to transmit this traditional knowledge”.

Q & A

Q: Do you use any chemicals? **A:** We don’t use chemicals as they contaminate native potatoes but some people use chemicals for producing small amounts of vegetables for the market. Native potatoes don’t need chemicals. Improved varieties have reduced productivity after four years and the flavour is not good, they are only good for frying. We’ve had a weed in the potato fields for the last six or seven years due to climate change, it erodes nutrients and requires increased labour to remove it.

Q: Have you been impacted by climate change in the last five years? **A:** Heat has gone up a lot. Last year everything was dry in the park because of low rainfall. But this year was good. It seems that all varieties resist heat, but you need to plant them at different elevations — when planted in transects they sometimes tolerate the heat at the second or third elevation. Black soil holds moisture better and has the highest production.

Potato Park interpretation centre: potato diversity and agricultural calendar (Pampallaqta)

Ricardina explained that the Potato Park has 1,375 varieties of native potato, and showed participants different types of potatoes on display. They have five groups of native potato: i) potatoes to make moraya (dried potato); ii) ‘boli’ potatoes to make chuňo (freeze-dried potatoes) which are dehydrated for longer storage; iii) potatoes for boiling “we can’t peel them or make moraya because of spirituality”; iv) coloured potatoes, which are purple and medicinal; v) knobbly potatoes, which are given to brides-to-be to test their peeling ability. They also freeze-dry oca, a long Andean tuber. The Potato Park sent 150 dry botanical potato seeds to the Svalbard Seed Vault in Norway, and a copy of these seeds is also stored in the International Potato Centre and the Potato Park, for local and global food security.

Ricardina, potato expert, Potato Park. Photo credit: Krystyna Swiderska

Lino explained the Potato Park’s Andean agricultural calendar. The year starts on 1 August. August is a month of offerings to Mother Earth, reading the skies and preparing the soil. They also look for biological indicators that indicate when it is time to plant. These include the fox’s howl and a flowering cactus. In September and October they continue preparing the soil and do early planting. In November they do the first hilling, break up the clumps of earth, and sow more seeds. January to March are months for hilling, breaking up the clumps of earth and controlling pests and diseases. Harvesting takes place between March and May, using traditional wooden tools. In June they select potatoes for seeds and eating,

Lino Mamani, Potato Park seed expert, with the traditional calendar, Potato Park. Photo credit: Krystyna Swiderska

and make moraya and chuño (freeze dried potatoes). Lino is a 'savio' (wise man) who reads the stars and biocultural indicators to know when to plant and harvest, and whether it will be a good year for the harvest, knowledge that has been passed down from the Incas and pre-Incas.

Gastronomy collective and medicinal plants collective (Chawaytire)

A traditional meal was cooked in the earth. An oven-sized hole is dug and round stones from the stream are placed inside with a fire. Layers of meat, tubers and herbs are placed on top and covered with earth. The women's gastronomy collective prepared a delicious meal with this and other dishes made from Potato Park produce, in the Papamanca restaurant.

The medicinal plants group 'Sipaswarmi' is largely composed of women and has a processing centre in Sacaca community but its members are from different communities. Valeria from Amaru community explained that their grandparents and parents taught them how to use different plants to treat different conditions, but they did not know how to make tea bags and used to not have pharmacies. Thanks to ANDES they were trained in processing and packaging, and a couple of products even have phytosanitary registration so they can be sold to hotels etc. They explained that all the economic collectives in the park use the Potato Park logo, it is an informal collective trademark. "Thanks to the training we can now make a bit of money to help our families — before we were just at home looking after our children". They added "we collect plants at special times of the day. We have to respect Pacha Mama. We don't collect them at 6 or 7am as insects are sleeping on plants, but can collect them between 8 and 10am. We don't collect plants at midday as the sun is very strong so plants get more pests and diseases, and because plants go black at that time which affects their potency. But we can collect them in the afternoon." They don't take plants from the roots but cut them, and they teach children about the uses of plants.

Once collected, they wash the plants three times, first in a bucket of water for ten minutes, then with a few drops of bleach and then they are washed thoroughly. The plants are then put on racks to dry naturally. They make mint tea, which is very good for digestion, salvia tea (a wild plant), which is very good for upset stomachs, and muña tea, which is good for colds and altitude sickness. They also make creams for bruises, fractures and sprains using several plants such as rosemary. All the plants used are medium plants, not hot or cold. Hot plants have to be cooled before they can be used (Andean understanding of medicine is based on hot and cold). The plants are ground and mixed with coconut butter. They also make soap which is good for sunburn, and potato shampoo (using materials that they order from Lima).

The group used to sell products to hotels and at fairs but not since COVID-19 because they have been short of materials. It is composed of two women from each community, so eight people in total. The members are chosen by the community and rotate every two years. Ten per cent of their revenues go to the Potato Park communal fund, and some is used to purchase materials. The Potato Park agreement states that economic collectives should have two people from each community, but more people can join.

Q & A

Q: Members from different communities have to travel to work as part of the group – what is the advantage of having members from different communities? **A:** The funds in the communal fund are distributed at the end of each year based on points — if a community has more people participating in a group, it gets more points and more funds.

Day 4: Governance of Biocultural Heritage Territories

Reflections on the visit to the Potato Park

Participants reflected on the most important things they learnt during the Potato Park visit:

NGO participant (Peru): The most important thing I identified was the strength of the organisation and governance of the Potato Park — that allows them to address problems and to avoid problems such as mining.

Q'eros community member (Peru): the Potato Park communities respect community protocols/statutes, they respect wild potatoes and have their own community seed bank and have medicinal plants and traditional dyes that they maintain, that is important.

Rehema (Rabai, Kenya): They value their traditional governance and they respect it and their mountain gods. They respect their culture very well.

Anthony Jao (Rabai Chief, Kenya): I observed that the community resolved the conflicts not the police. In our country everything is done by the police, but here everything is done by the community and the communities resolve conflicts themselves. We need to learn that in Kenya, we need the government to support communities more.

Asha (Rabai, Kenya): I learnt that the children are involved in cultural activities from a very young age unlike in Rabai, and that medicinal plants can be used to make products.

Daniel (Rabai Kaya elder, Kenya): I saw that the people of the Potato Park believe in their culture fully.

Hania (Centro Bartolome de las Casas, Peru): The whole process of transformation felt very interesting, the medicinal plants, organisation of women. When asked if scientists taught them to improve potatoes they said no, their grandparents taught them.

Yufen (China): The Potato Park does seed conservation from seed to table. I noticed that women in the community have more confidence and are more proud of their culture, they are showing to visitors. That is a change since my visit in 2014.

Brenda (Geoyachaq, Apurimac, Peru): It was wonderful to visit Potato Park and learn about the process of engaging the community and how it took years. I saw that the community has strong awareness of their rights and customary laws, and places strong value on their potatoes. The Potato Park is not just a culture it is a way of life — we want to learn to replicate this model so we can do it in other places.

Bolivian elder: The most important thing was learning about the importance of co-living with nature and Mother Earth.

Q'eros elder (Pautarcambo, Peru): I was most impressed by the learnings that come from the past and the Incas and continue to be alive in the practices, and by the reverence for the Apus and the co-living that the communities have ('convivencia'). In our community these practices have got a bit weak but seeing the Potato Park's experience, we learnt that their revival is possible.

Q'eros youth (Paucartambo, Peru): I learnt that if there are problems with the youth, the Potato Park has a group of guardians of potatoes who have deep knowledge. They know how to predict the weather, and how the fox, plants and stars provide indicators throughout the agricultural calendar. We are trying to transmit traditional knowledge through schools so it is not lost. We feel it is our responsibility to transmit that knowledge to youth and kids.

Participant from Centro Bartolome de las Casas (Peru): All the networks of solidarity and reciprocity in each of the economic groups have not just maintained traditional knowledge but have also innovated based on it. I saw the solidarity of the women, they said they are members of the groups for two years and then pass this to other women to strengthen their capacity, so there is solidarity.

Omari (Rabai Kaya elder, Kenya): I learnt a lot. What I liked most is that the Potato Park has conserved herbs to make herbal medicines, because Rabai has a lot of pollution which impacted herbal medicine practice; and that the Potato Park has its own conflict resolution mechanism as we also have

in Rabai. But in Rabai traditional knowledge and culture have been weakened because it is close to a city and has many immigrants and that has led to weakening of the culture through modern churches.

Krystyna (IIED): I learnt that the inter-community agreement means that members of economic groups from different villages participate in the groups so that they get benefits at the end of each year — so the agreement links the monetary economy with cultural values of collectiveness and solidarity.

Local government representative (Bolivia): I learnt about the importance of collaboration with the NGO ANDES that is committed to the Potato Park.

Q & A

Q (**Chief Jao, Rabai, Kenya):** I saw that the youth of the Potato Park are not involved in the activities?

A (Ricardina, Potato Park): Our visit was on a Saturday, when the youth have to be with their parents attending their chacras (fields), animals etc. In the park we all have to work otherwise we can't live. Some youth are at university, but we ask them to come back and help us to defend our rights. They don't get money for farming so some youth leave the community and others are coming back.

Alejandro (ANDES/INMIP): Ricardina has been President of her community, and done farming and running after alpacas. She is also involved in research on climate change with researchers from universities as a local technical expert. Two local experts from each community get a small fee (a 'tip') from ANDES — they are elected by the community assembly so that way there is a direct link between what ANDES does and the community governance. It is a holistic approach — from human rights, to conservation of the landscape, to development of policies that are broader than the Potato Park, to the use of customary laws. So ANDES contributes information from outside but the work is based on existing local normativity. The Ayllu concept is very important — sacred elements etc.

Tammy (ANDES): Often universities think that they are the experts and they should lead, but the experts are the people who know the territory. So supporting them means that we need to let them lead — they decide what enterprises to establish etc. and we (ANDES) only support their decisions. ANDES and students/researchers also bring our own knowledge but we have to work with a lot of respect for what the community decides.

Q: Who can do offerings to the mountain gods, is it only Andean priests? **A (Ricardina):** Each household can do offerings, for example, in August, on special days, and on days to celebrate our livestock we prepare chicha (fermented maize beer) so that they get stronger. We do it ourselves for our animals. But for special events we do need an Andean priest — a 'Paco'.

Q: In the statutes of the Potato Park is there anything specific that prohibits the use of chemicals?

A (Ricardina): No, but we don't use chemicals.

A (Alejandro): The Potato Park is like an umbrella — each community has its own regulations to maintain its cultural practices, reinforcing their beliefs and customary laws. So the Potato Park respects what is in the community constitutions. Some people produce for the market so they may use chemicals but not for native potatoes. This is something we are still discussing.

Q: What is the relationship between the Potato Park and ANDES?

A (Ricardina): The government brought big potatoes but the seeds didn't last two years. If we did not have a good relationship with ANDES we would not have achieved so much.

A (Alejandro): How relations are built with the community is very important, you have to have a shared vision between community leaders and ANDES, to create change in society based on our respective strengths. We are called ANDES because 'andeneria' means terraces — the landscape was terraced but that technology was extinguished. For an ecology like ours with strong limitations of water and different altitudinal zones, you needed strong cooperation, given the complementarity between ecological zones. We have a shared vision and that has facilitated collaboration.

Q (Participant from Apurimac): ANDES is very strongly cooperative with the community. How is ANDES working with the community to engage youth?

A (Alejandro): We strengthen the dynamic that exists in the community. We see what the challenges are in relation to migration and youth, and based on that we develop activities that can help resolve

problems. We engage youth who can help resolve those problems before bringing solutions from outside. We hold some reflection workshops. We have established a youth network on agroecology, with youth from the Potato Park and the Chalakuy Park in Lares.

A (Jessica, ANDES): We also use technologies to engage youth, such as producing videos. In the Potato Park, we need an administrator and we show them how to use computers. Yon is now an accountant. Some youth don't have education opportunities so we work with them.

Q: The inter-community agreement brought the communities together — what were the main elements of that and why are they important?

A (Aniseto, Potato Park expert): In our visit to the Potato Park we talked a bit about the inter-community agreement. The Potato Park started with one community, and then we got the consensus of all six communities to establish a Potato Park. For it to work we had to have a law or statute that indicates the duties and rights, how communities will participate in the Potato Park and how the benefits will be shared. The agreement is based on the Ayllu system — on Auki Ayllu (the sacred) which is customary law. It also talks about protection of the territory and environment and conservation, and about benefits — how communities can benefit from the communal fund and donations to the park. So it sets out how we work together. It talks about duality, reciprocity and solidarity — the Andean principles. For example, the Potato Park gave 10,000 kg of potatoes to old people in Cusco and people in prison during COVID-19. So rights and responsibilities are included in the agreement and also how we work together — if a community wants to withdraw from Park how that happens, or if another wants to join. Organising six communities is difficult, so that organisation is not only in the Potato Park, but is also a model for creating other parks in other countries — for example, in Ethiopia, where communities have taken this model. So as an organisation we should help other communities to organise themselves too, and establish a network of Indigenous Peoples. Then we can achieve a lot in the face of threats from authorities such as mining. We should always fight to find Buen Vivir.

Governance challenges of Biocultural Heritage Territories

During the visit to the Potato Park on day 2, participants learnt about the Ayllu system, where the world is composed of the human, the wild and the sacred communities that must be in balance and reciprocity to achieve wellbeing, and how this holistic cosmovision guides the governance of the Potato Park. In this session, participants worked in country and community groups to identify equivalent cosmovision concepts and values in their cultures, and explore how these are applied (or could be applied) to the governance of Biocultural Heritage Territories and economic initiatives, and related challenges. Each group presented their work using maps, and participants shared suggestions for addressing the challenges:

Rabai community, Kenya

Rehema (community researcher) and Abdala (youth) explained that 'Mudzini' is a holistic concept in their culture equivalent to Ayllu. "Our community is connected by Kaya forests, and in the landscape we have the community homestead (Jamii), the sacred Kaya forests where prayers are said, and farms (shambas). The Kaya forests also serve as the wild and are linked to crops as some crops are domesticated from Kaya forests. Musunga is medicinal and when we use it regularly we don't get malaria. We construct houses using trees from farmlands and some of those trees have been domesticated from the forest." Mudzini is: 1) the wild and sacred together; 2) homesteads; and 3) farmland. They also have values associated with the Kaya landscape, including unity (Mwenga), solidarity, equilibrium (Soyoyo) and collectiveness.

The Rabai governance system includes customary laws developed by the elders. For example, the cutting of trees in Kayas was restricted and if someone was found doing it they could be fined. If the community had been mobilised to go and clean the paths in the Kaya and some community members failed to go the Kaya elders could fine them (for example, by taking a chicken).

One challenge in governing the landscape is that when community members are called on to perform a function, such as to do restoration work in the Kaya forest, some community members don't participate. One reason is that if they participate, others may think they have been paid some money to do it and have benefited themselves using the community's name. Also, modern religion has eroded and weakened customary laws and now many community members don't respect them so there are many illegal activities in Kaya forests. Urbanisation is a challenge because Rabai's Kaya forests are very close to Mombasa. In the past people used to stay about 20 km from Mombasa but as Mombasa is

expanding people are living very close to Kaya forests and are causing a lot of destruction. Most people coming from outside (immigrants) are not Indigenous and so don't respect culture and customary laws. Also there is a lack of economic opportunities in Rabai so many youth have left and there are very few remaining who can engage in learning traditional knowledge from Kaya elders. Another challenge is the national government laws. For example, a chief can arrest a culprit taking resources from Kaya forests and take them to the police, but the police release them as they are given a bit of money.

Q: What is the main problem — why is there so much migration away from the community? **A:** The reason for migration is economic, many youth are looking for opportunities to make money. Young people in Kenya always want to make money and this can only happen when they move to cities.

Q (Ricardina, Potato Park): How do you feel seeing the people leaving to the city? **A.** The community feels bad but there are no options for them to make money in Rabai.

Chief Jao (Rabai, Kenya): People are arrested for degrading the Kayas and then go home. The new constitution of 2010 divided our government into national and county government, and because of devolution the issue of forest conservation was given to the county government. As Chief I am told to bring the complainant but they don't turn up to court, and by law they can be released in 24 hours if county government officers don't come.

Krystyna (IIED): Rabai is a beautiful landscape and two Kaya forests are UNESCO World Heritage Sites. So if Rabai revives traditional culture and foods, there is good potential for ecotourism, trekking and homestays.

Alejandro (ANDES/INMIP): You have forests, a beautiful landscape and medicinal plants that can be used to make creams, for example, so there is strong potential.

Abdala: There have been some efforts like beekeeping but security is a challenge as some community members will steal honey. Kaya elders from Kilifi county met and submitted a request to the national government to have those Kaya forests gazetted and managed by national government (Kenya Forest Service).

Samaipata municipality, Santa Cruz, Bolivia

We also have the concept of 'Vivir Bien' in Bolivia, consisting of three circles or spheres of life: material life, spiritual life and social life. This vision of Vivir Bien links all the communities in the country. It is earth-centric ('Pacha-centrica'). Each community has three authorities that work in a coordinated way: one responsible for farming, another in charge of society, and a third that informs local government. That constitutes our community organisation. In our 'social life' we have our laws and we look to create reciprocity, or 'Ayni' and 'Minga' — these are ancestral concepts that we maintain. Reciprocity principles have been adopted by non-Indigenous Peoples who live in the area.

We face several challenges. One challenge is establishing inter-cultural alliances, as there are more than six cultures in our territory and this mix of cultures from different parts of the country has generated certain clashes. But we all look for Vivir Bien, because foreigners are looking for nature and to live in a traditional culture. Indigenous Peoples feel that immigrants have imposed some cultures so the municipality aims to look for the good in different cultures that contribute to Vivir Bien. We have different ecological zones, so we want to apply Vivir Bien in all of them. Further challenges are: the need to transform to agroecology, regenerative or organic agriculture (a big challenge in Indigenous territories); conventional agriculture practiced in protected areas; managing water in an intercultural way; and how to link culture with tourism and the private sector and share benefits across communities. Mining for clay to make ceramics (mainly floors and kitchens) is a big threat because the municipality does not regulate extraction of clay and it affects natural sites many of which attract tourists.

Ricardina (Potato Park): My recommendation would be that as a municipality you really support farmers who are the people from the territory.

Q: Is nature included in the concept of Vivir Bien? **A:** Yes, the Pacha-centric (earth-centred) worldview means that nature or Mother Earth is the basis for the three spheres of life. Every municipality has to develop its territorial plan and develop a Plan de Vida according to the different cultures in the territory.

Stone Village, Yunnan China — Naxi and Moso people

The Naxi people of the Stone Village and Wumu Village, and Moso people of Youmi and Labo Villages, have traditional beliefs similar to the three Ayllus:

Nature and God: They believe humans and nature are brothers, and strongly respect mountain gods. If humans obtain more natural resources, they will be punished. Every year they have mountain worship and ancestor worship ceremonies.

Humans/society: This includes the elders' association, women's group, water irrigation management system because they believe water is collective, and the Dongba (traditional priests).

Mother Earth: Includes wild plants, agricultural terraces, and animals. They believe in a 24-part agricultural calendar where "24 solar times teach us when to plant". From Mother Earth come customary laws.

Challenges include the loss of Indigenous languages, because many tourists visit the Stone Village and schools have a policy of not speaking local languages, only Mandarin. Their own Naxi language is totally different to Mandarin Chinese so it's really hard for them to learn it and tourists come and laugh and say why can't you speak standard Chinese. Also there is no school in the Stone Village so children have to leave, and language and culture are not passed on to the next generation. Land in the Stone Village is privately owned, not collective. But water is for whole community (collective) so they really follow customary laws. Every village has a committee led by the Chinese Communist Party. Because the government is very strong, people have to listen to the government so they do not have many protests.

Q: In China are there also violations of rights? **A:** In some places where native people are members of the government it will be good for IPs. We understand we have rights but don't feel comfortable speaking about them. IPs in China have more rights to protect their homelands than other people.

Q: What measures are being taken to protect the rights of IPs including native languages? **A:** In some villages we have Dongba who teach children about their own languages. But due to the national education policy only one language is taught.

Q: In the diagram, Nature God is at the top and Mother Earth at the bottom — what is the difference? **A:** Mother Earth is the foundation of everything; and God above protects everything including people and Mother Earth.

Q: In China are traditional varieties allowed? **A:** Yes. Communities are allowed to exchange seeds. Shoyiun is a farmer breeder, and the Farmer Seed Network organises festivals every year to promote exchange of seeds.

Peru NGOs

The group focused on the institutional vision for addressing the main challenges. They explored the challenges faced by the three Ayllus due to government policies. In Runa Ayllu they have community assemblies and Ayni (reciprocity or mutualism). There is a mechanism of Indigenous quotas in elections but IPs never have positions of power in the government and Congress, so Sumaq Kawsay is not represented in the state governance system in the Andes or Amazon. In the law of campesino communities there has not been an update to support IPs to improve their livelihoods to address current or new challenges.

Free, prior and informed consent is not respected — for example, for mining and forest concessions or other natural resource extraction projects — despite being a legal requirement. There is no mechanism to ensure a participatory process for communities such as in the development of extractive projects in IPs' territories, or to ensure processes of consultation are equitable, given that mining companies have a lot more power. "We are a megadiverse country with many cultures and dialects, tropical forests and mountains — all of this is our Buen Vivir — but it is threatened by policies that are being implemented in our country."

There is a law declaring a moratorium on GMOs which was result of a massive mobilisation of NGOs and others, but the Ministry of Agriculture is now asking to import transgenic maize and cotton. "They say that food crops will not be affected but we know that this threatens all our biodiversity. So the big challenge is to organise ourselves, to resist governments that develop extreme right policies when they are in power."

Chemuku (Kenya): In Kenya we also have very little representation of IPs in higher offices.

Q (Kelly, Apurimac, Peru): How are NGOs engaging governments in projects with communities? **A:** We want to generate resistance to these state processes. We start at local level, focusing on agroeocology and recovering ancestral practices, but we also need to engage the government to reach a larger scale. Government policies are not supporting communities so we want to organise communities and form a green party that can lead on nature issues. Empowerment of IPs is also very important. As NGOs we can influence municipal governments, but we want to also engage IPs to participate directly. For example in Cusco there are many Indigenous communities that are autonomous. We want communities to be part of more political action and have their budget — it is important for communities to be able to organise like the Potato Park to revive culture.

Alejandro suggested that this forum could be used to say something about the threat of GM crops in response to the proposal to allow GMOs. Others suggested that all participants from Peru could record the voices of farmers against GMOs, and that more Potato Parks should be established.

Peru — Potato Park, Q'eros and Apurimac region

Ricardina from the Potato Park explained the local challenges faced by communities:

- The government does not respect ILO Convention 169, that is, our territorial rights. They don't see the reality that we live with nature, and they introduce laws that don't respect this.
- Local, provincial and regional governments take advantage of our communities and use our knowledge for their own interests. At election time, they come with their promises. Those in Congress don't represent us or do anything for us.
- When we go out to protest we are told we are lazy but they don't know that we produce food and we support people living in cities.
- In our communities the state does not protect our rights, it continues to privatise resources and when we go to the street to protest they don't listen. State initiatives are ignoring our challenges, for example on climate change.
- Another issue is that there are often religious people in our communities that makes it challenging to continue our ancestral practices. We see a weakening in our communities with our children going away; we are trying to conserve nature but the state is extracting our resources. But despite this we maintain our traditions, and in the Potato Park our kids are coming back.

Q (Chief Jao, Rabai, Kenya): Don't you have human rights organisations with lawyers who can take the government to court if they don't respect the community? **A:** We don't — we have regulations in our communities that help and we have organisations that can support us, such as ANDES. If we didn't have this we would not be informed about GMOs, for example.

Q'eros community member (Peru): Since we have 48 communities it is difficult to control things, but those of us who are conservationists are coordinating in our community to avoid GMOs arriving.

Pichiwra (Apurimac): My community comes from a long process of violence — it has gained territorial rights but doesn't have an organisation that supports us to defend our rights.

Q (Alejandro, ANDES/INMIP): The relationship between communities and the state is important. Ricardina reflected about the vicious cycle where we elect authorities who we think will protect us but we lose them because of changes in government or strong corruption. How can communities and their allies look for other options? **A**: The solution is to have hope and faith as our kids are preparing with education so they can help us, we need to keep our faith and hope in future generations that are coming.

A Q'eros participant suggested that to address these problems we need to recover the values of our ancestors. And another participant added that a practical solution is that Ricardina should become a Congress member. It was noted that similar challenges emerged across groups — on youth outmigration, mining, and legal and political systems.

Biocultural solutions to key challenges facing communities

On day 1, each group identified key challenges facing their communities and biocultural heritage, and captured them on post-it notes, which were then grouped together to identify the five key themes:

i) **Water shortages and drought:** water crisis due to loss of vegetative cover (Peru); a lot of drought; before there were small frogs but they have been lost due to biological control; reduced water provision; water shortage due to deforestation of Kaya forests.

ii) **Forest degradation:** cutting of trees in rainforests and southern Peru, which has increased with decreased regulation and easier approvals under Peruvian law, and forest degradation by grazing livestock in Peru; reduced forest cover, loss of several varieties of fish, flora and fauna, burning of forests and major forest fires in Bolivia; deforestation in Rabai's Kaya forests — illegal harvesting of trees for charcoal to sell to growing population in Mazeras and Mombasa.

iii) **Extractive industries and pollution:** the state's extractivist paradigm (Peru); sand mining in Kaya forests has triggered landslides and erosion (Rabai, Kenya); industrial pollution has contributed to increased human diseases and air pollution has affected farming (Rabai); garbage due to tourism (Stone Village, China); much greater use of agrochemicals to deal with potato blight, Andean weevils and other diseases (Peru).

iv) **Climate change:** adverse climatic events; prolonged changes in seasons, increased temperatures and reduced productivity; melting glaciers (Peru); mudslides (Stone Village, China); worsened crop pests and diseases and weeds.

v) **Youth and traditional knowledge:** loss of livelihoods and traditional knowledge (Peru); youth outmigration (Bolivia); erosion of traditional knowledge and culture leading to loss of traditional crop varieties and youth outmigration as a major contributing factor (Kenya); loss of traditional languages (China).

Participants explored solutions to these challenges, focusing in particular on 'biocultural solutions', which stem from traditional knowledge and biocultural heritage, and practical solutions and innovation systems that need to be integrated in national plans for adaptation and mitigation (Nationally Determined Contributions etc.).

Water and climate change

Q'eros community member (Peru): Communities are protecting lagoons and native plants, which conserve water. They have their regulations, such as don't cut trees; they need to plant more around lakes. Pesticides and chemical fertiliser contaminates water but is not controlled, so that also needs to be put in the statutes of communities.

Q'eros youth: We have awareness, but there is also a need to raise awareness of industry; and we need support to recover ancestral infrastructure like water channels, which exist but need upgrading.

Participant from Apurimac: Communities should develop norms/statutes to say what they will do to address climate change, for example to forbid cutting of trees, and the government should respect these.

Participant from China: We plant many types of crops and resilient native crops, and water is stored below ground so we can use that. We also use drip irrigation and have a customary water management system in the Stone Village.

Krystyna (IIED): There are huge subsidies for monocultures, pesticides and fertilisers. These could be repurposed to subsidise and promote diverse varieties and agroecology.

Alejandro (ANDES/INMIP): It is important to recognise IP's rights and their role in management of water and land, and to incentivise collaboration and networks between Indigenous communities. States should not privatise water, and should prohibit GMOs. Climate justice is very important — government decisions should be based on climate justice. Monitoring and evaluation systems of adaptation projects should include traditional practices of IPs and see if they really benefit IPs. Millions are spent on adaptation and often nothing reaches the community level, so there is a need to monitor this.

We should call out 'false solutions' — carbon markets and implementation of projects like REDD which affect agriculture, and markets for environmental services that look to privatise land and resources — really the air is being privatised. People even want to privatise whales. We support renewable energy — solar and wind — but it is also important to reduce energy consumption in general since solar panels

and wind turbines use minerals and that leads to human rights abuses associated with mining. All the wars that are happening are contributing to climate change, so we need peace.

Mining and industry

- It is important to address mining not just for fossil fuels but also due to renewable energy demand (for example, copper)
- Free, prior and informed consent (FPIC) is very important but mining is often done without FPIC; and FPICs ensure the active participation of communities.
- Mechanisms for conflict resolution should be based on customary laws as these often define the parameters of justice.
- The biocultural heritage of mountain IPs, which is immense, should be protected and preserved. Mining extraction should be banned completely in these zones.
- Transparency and accountability is important — often if there are impacts there is no accountability from companies.
- There is a need to ensure participatory monitoring at local level — by local government and communities.
- Programs for economic development must be created with a long-term vision of Sumaq Kawsay as opposed to a vision that is purely extractive.

Forest issues

- Key challenges to be addressed include forest degradation due to firewood consumption, and increased forest fires.
- **Rabai, Kenya**: The local administration should enforce the recommendation that all farmers should have trees on their farms. Chiefs have the authority to make laws on their own territory — they can sit down with assistant chiefs and agree this as a law in the community. Kaya forests are very rich in biodiversity. We also need to create awareness on the importance of protecting and conserving indigenous tree species as over 60% are medicinal.
- **Alejandro (ANDES/INMIP):** Protection and restoration of biodiverse forests must be prioritised, not just tropical rainforests, and trees need to be planted on-farm — not just for climate mitigation but for multiple livelihood benefits. There should be a focus on indigenous species because often reforestation focuses on exotic species and doesn't benefit communities.
- It is important to ensure very strong community participation in forest protection and restoration — communities should be really central. Clean alternatives, such as energy-saving alternatives to fuelwood, should be promoted to reduce pressure on forests.
- We should say no to carbon offsets — these have proved to be a false solution as they have not reduced carbon emissions.
- Traceability of wood — where it comes from — needs to be improved. This is difficult if institutions are weak, for example in Pucalpa, Peru.

Traditional knowledge and youth

Many communities are seeing a loss of traditional knowledge, language and culture, youth outmigration, and lack of work in communities. The loss of traditional knowledge has led to loss of native crops and to migration of youth. To make youth stay in communities, the local biocultural economy needs to be strengthened.

Education systems should be as close as possible to communities and should incorporate local practices in the territory and Indigenous languages. Inter-cultural education and capacity building is very important.

Alejandro (ANDES/INMIP): It is the responsibility of community and local authorities to ensure intergenerational transmission of traditional leadership. We should call on states to integrate Indigenous youth in all aspects of climate decision making and policymaking as they are the generation who are going to experience the consequences.

Documentation of traditional knowledge is very important as many young people don't know about traditional knowledge, they don't know how to interact with nature. Traditional and western science should be respected equally — from monitoring to adaptation. The Intellectual Property Rights of communities over their traditional knowledge need to be protected — but not using patents as they privatise knowledge, which is collective.

Day 5: Visit to the Chalakuy (Barter) Park, Lares

Barter market in Choquecancha, Chalakuy (Barter) Park Lares. Photo credit: Krystyna Swiderska

Choquecancha town: welcome and introduction

After a night at the hot springs in Lares (Calca province, Cusco region), participants travelled to the small rural town of Choquecancha (1,200 inhabitants) at dawn. The community gave them a very warm and joyful welcome, with flower petals thrown over them, hugs, and a procession of traditional music and dancing. In the town square with an old Church and a statue of an Inca leader, the community President and community Mayor expressed happiness and pride in welcoming INMIP participants who had travelled a long way. They explained that Choquecancha is an Indigenous community with various sectors. "We maintain the Inca culture — we have the 14 doorways of Choquecancha in this Inca wall, each doorway had a statue. And we have a colonial Church dating back to the 1500s, and an Inca trail to Sacsayhuaman. It is possible that we are the entrance to Paititi — the lost city of the Incas. We are two hours from Machu Pichu."

The 'Alcalde de Barras' or 'Mayor of Bars', a traditional Inca leader who carries a long pole, also welcomed participants. He explained that: "we grow maize, potatoes and traditional crops. We have traditional garments from our Inca ancestors. We enjoy traditional foods — some of our favourites are guinea pig and chicken. And we take part of in different activities and dances." The Alcalde de Barras is a ruler or alderman. The community President, community Mayor (government) and Alcalde de Barras are all elected by the community. They are trying to strengthen the Alcalde de Barras "because for three years there were none. But no one wants to do it as there is no salary and because globalisation and technology have displaced traditional culture a bit". In Lares district there are only two Alcaldes de Barras.

The community President uses the law of campesino communities, the Mayor uses the law of municipalities, but the Alcalde de Barras doesn't have a law, so they want to develop customary laws to take to the Congress so they are recognised. They have a tourist circuit with waterfalls and Inca paintings and houses, and charge 10 soles entry fee. They have two potato wild relatives, and foxes, puma (as the rainforest is only 30 minutes drive away) and venado (deer).

In the town square women from the Potato Park exchanged potatoes for maize, beans and other Andean tubers with women from Choquecancha.

Chalakuy (Barter) and Maize Park walking workshop

Walking workshop, Chalakuy Park. Photo credit: Krystyna Swiderska

Barter markets and traditional culture

At the viewing post of Choquecancha community, overlooking a beautiful lush green mountain valley, Victor welcomed participants to the 'Chalakuy' (Barter) Maize Park over a traditional breakfast. The park is composed of four communities, which have barter markets (Choquecancha, Rosaspata, Ccachin and Pampacorral). "Barter markets are very important for our livelihoods. They have existed since Inca and pre-Inca times." They plant maize, potato, beans, oca (an Andean tuber), squash and wheat, and exchange them for bananas, oranges and avocados from the lower part. He added: "We do barter between the lower, middle and higher parts. Our forefathers always did barter because they did not have enough money."

Dona Petronela added "barter markets come from a very long time ago, from our great, great, great grandparents. They used to bring things from Urubamba like ceramics, that is part of barter. They brought barter items by donkey." About 50 years ago they started reviving barter markets with new products that come from the valley area. Then roads reached the communities and that led to expansion of barter markets. They didn't know money before so they did barter. They get coca leaves through barter — they are very important to work on chacras (fields). "Our children are nourished well.

Barter is done both in the lower and higher altitudes. It connects the upper and lower areas, gives us food and educates our children."

The Mayor of Choquecancha (Javier) explained that Lares district has four populated areas. The Mayors are working with social organisations — that is, community constitutions. "We still have Inca culture that worked agriculture and didn't have money, and worked on the basis of Ayni (reciprocity) and Minka (collective labour) and social arrangements. Because of that there is the route from Machu Pichu all the way across this valley." He added that "the textiles and culture survives with the autonomy of each person. That is why we will support the community with traditional seeds. The Mayor only gets a budget of 5,000 soles per month, so with that we will support traditional leaders and strengthen our living culture." He explained that the Alcalde de Barras are elected people who have done a lot for the community. They are rulers who help to spread the word in meetings and maintain customary laws.

Q: Has the barter market become more in demand by communities in the last ten years or so? **A:** Barter has declined in the last ten years but in 2021 the municipality of Lares passed a Municipal Ordinance to recognise the practice of barter and the barter markets as valuable cultural heritage of Lares, which make an important contribution to local food security. The Potato Park brings freeze-dried potatoes (moraya, chuňo), which people in Lares love, and it gets maize and beans. ANDES has supported the barter markets a bit — they paid for transport for the Potato Park in the hope that it will encourage revival of barter in the Potato Park and Lares. Pisaq barter market (near the Potato Park) has been replaced by a crafts market for tourists. These three communities (Choquecancha. Rosaspata and Ccachin) are mid zone (mid-altitude) where a lot of corn is grown and Pampacorral is a bit higher so they also grow potatoes. As it is June they are in the midst of harvesting corn and potatoes.

Traditional weaving

Participants walked down the valley to a field where women were gathered doing traditional weaving. They explained that women do weaving while tending animals. "This weaving is for personal use but as tourists come we are also selling some products." They make bags, ponchos, rugs etc. "Before marriage, women make ponchos for husbands — ponchos are very important clothing." They use traditional back-strap weaving methods. All girls can weave by the age of 16, otherwise they can't get married. Previously they always used to do traditional weaving and used herbs to dye sheep, alpaca and llama wool — it was all natural and hand-woven. But today they see a lot of synthetic clothing. In the Chalakuy Maize Park, they have also established an association of communities with a chair/secretary and they have an agreement on how to work together. In Youmi Village, in Yunnan, China, two ladies are doing the same traditional weaving.

Traditional maize farming and harvesting

In another field, a farmer explained how traditional maize is cultivated. They use traditional tools and a bull to help till the land. Maize is planted every year with no rotation. They till four times in one season. They do a ceremony at the start with dancing and have a big ceremony at the end. A women farmer explained "in addition to corn we plant beans, and over time we weed the field". When the corn dries and the beans start to dry, they harvest them. "We dry the beans in the sun and then remove the bean from the inside, and take the husks off the corn to allow the corn to dry out in the chacra, and then take the harvest home on a horse. That day we have a special meal with guinea pig, lamb and chicken. The biggest corn we tie together with coca leaves and do a chica (maize wine) ritual." The corn can be stored for a long time for barter or food.

Q: How is the chacra system influenced by the Ayllu concept, where the human, wild and sacred need to be in balance? **A:** We use biocultural indicators — for a good harvest we need good bright stars. We observe a plant — if there is a big flower there will be a good harvest. And if the fox howls very loudly, there will be a good harvest.

Participants then visited Petronela's farm where large piles of different coloured corn were drying. She explained that they have many varieties of corn — she plants 60–80 varieties. But they have a lot of pests and diseases, such as a worm in maize. They plant maize with quinoa, beans, squash and another type of bean ('poro') together in association. At lower altitudes they plant yellow corn, at mid-altitude red corn, and at the top they can plant both red and white corn. "When we harvest by hand we get more grubs, so we use animals to harvest and dry corn in the sun and the grubs dry up so we don't have such a problem. When there is increased humidity, the corn gets rot because of climate change.

In storage, it can get rot and the worm/caterpillar of a moth. In the field, other things can attack corn — a type of weevil attacks corn in Cusco but it is not present in our corn because it has very hard skin."

Q: Do you cross maize using traditional knowledge to improve it? **A:** We only use traditional varieties, not improved ones, and we know that maize cross-pollinates easily, so we plant yellow maize at low altitude, and red and white higher up, to maintain the diversity. Maize can cross-pollinate from 300 metres away. We work all the land communally and we coordinate. So for instance, if one person plants one type of corn, the other has to wait. The moon is very important for many things — you can't plant with a full moon but need the moon for the selection process for the light. 80% of our production is for consumption and 20% for the barter and sale. Corn can keep in storage for ten years.

Chalakuy Barter and Maize Park. Photo credit: Krystyna Swiderska

Family seed bank

Further down the valley, in a small cluster of traditional houses, a family seed bank has been established with support of Asociation ANDES and an Oxfam-Novib project on agrobiodiversity, which highlighted the importance of community seed banks. Lidia, a Quechua woman farmer, explained that they have 55 varieties of corn. They store the seeds in plastic containers so they keep for longer (it keeps the moisture out). Yellow corn is good for many things (such as soup and chicha maize wine). White and red corn are good for roasting. Cuti corn is used for healing people with different types of illnesses. If corn has an extra bit (a side growth) it means there will be a baby soon. One type of corn is used for a ritual where you tie a rope around a pile of corn and put coca leaves under the rope. This is done to trap the spirit of the corn and get the blessing from the Apus or mountain gods (coca leaves are used to communicate with the Apus). The corn known as 't'ake maiz' is a biological indicator when it's in storage — if it is a light colour there will be drought and if it is black it means it is going to be a rainy year. The Chalakuy Maize Park has 12 family seed banks (four in each of the three communities that grow maize). It also has one community seed bank for potatoes (in Pampacorral) and one community seed bank for maize (in Ccachin).

Victor manages the maize community seed bank — it is managed by the President and Directorate of the community and they have a communal plot where they produce seed for the community seed bank. They are not connected to any external seed banks — these are just family and community initiatives.

The Chalakuy Maize Park has an inter-community agreement like the Potato Park but it is not really working for benefit sharing at present as they don't have much in place with respect to economic collectives.

Climate change has impacted the park — it has got much hotter and worm pests have intensified. When corn is harvested, chickens are used to eat the grubs. Choquecancha has a collective land title but it doesn't coincide exactly with the traditional territory.

Q: How do you ensure seed viability? **A:** A first and very important step is doing an offering to Mother Earth and to the mountain gods — if you do that at the start that will ensure good seeds. Also it is best to save corn for only one year to ensure the seed is viable, but in the community seed bank it lasts four years.

Q: For the community seed bank, does each community have an agreement to share seeds? **A:** We work together as a community, and each community saves seeds.

Chalakuy Park family seed bank. Photo credit: Krystyna Swiderska

Reflections on the visit to the Chalakuy Maize Park and climate change

Alejandro (ANDES/INMIP): In Chalakuy Park, all family members are involved in family seed banks. If they are community seed banks, only a few people engage but at family level more people can be engaged. Through barter people can get products from far away. All the communities have a high level of non-monetary economy, but government plans often ignore this.

Chemuku (KEFRI): I think the diversity of crops is what makes barter markets survive.

Q'eros community member: Good to see barter is alive, in other communities there is hardly any barter. We have also practiced barter for the last three years through exchange of seeds. This year on 5–7 August we will have a seed fair.

Yiching (Farmer Seed Network): I was very impressed by the Indigenous leaders and women, they were so full of energy. In the barter markets I did not see much food but a lot of seeds. Also I saw a strong network and they have two community seed banks. Community leaders support them very much and they also have a community managed seed field.

Leila (KEFRI): They have a strong community governance system and community-driven approach, and the local government is supporting it. I wish we had a similar backbone in Kenya.

Chief Jao (Rabai): I learnt a lot. We eat a lot of maize in Kenya, but we only have about five maize varieties in Kenya and people mainly use improved varieties. Can barter also be used, for example, to pay for petrol? A. No, barter is only for food.

NGO participant (Peru): GMOs threaten small farmers and agrobiodiversity. They benefit big producers but we must say we don't want GMOs. The government of Peru has proposed to change Peru's national law banning GMOs, to allow GMOs. This is being discussed now in Lima. This law is a good example for other countries and communities that want to transform to agroecology. Also with climate change it is important to prevent GM contamination to conserve agrobiodiversity.

Sonia (Chalakuy Park): Maintaining traditional authorities like 'varayocs' is not easy — in other communities it is disappearing. Blowing of the seashell (conch) or 'pututo' by kids is part of our tradition but they go to school and it is hard to engage them in these activities. When we hear the pututo we know something important is happening. We respect traditional authorities more than formal authorities because they are closer to us.

Victor (Chalakuy Park): When we hear the pututo it means it is time for a meeting. But now with mobile phones people use WhatsApp. But in Ccachin and Choquecancha we still respect those traditions. I participated in COP20 but the agreements are not being implemented — there is still extraction in big countries but that is affecting us — we must raise awareness. With new varieties (such as GMOs) the seeds don't last, they are no good the next year, and they are making us lose our culture.

Ricardina (Potato Park): The lower planting line for potatoes has gone up by 200 metres in the last 30 years due to rising temperatures and soil pests. Also, eucalyptus trees have been planted in the park and we have seen they take a lot of water. And glaciers have been lost. And now there is plastic contaminating the communities and countryside and we want to stop manufacturing plastic. Now we want to plant native trees. Companies are continuing to contaminate and cause climate change and we should ask governments to remove those factories that contaminate. Government bodies are obliging us to do reforestation but they are consuming our pasture and farm plots.

Krystyna (IIED): The rising lower planting line for potatoes means land for growing potatoes is being lost. At least seven native potato varieties have been lost because of this, and related traditional knowledge. This is Loss and Damage due to climate change — it is very topical and we should mention it in the INMIP Declaration for COP29 and COP16. That figure of a rise of 200 metres was in the INMIP report of 2017 — has it increased since then?

Alejandro (ANDES/INMIP): I think the lower planting line has risen by over 300 metres in the Potato Park.

Victor (Chalakuy Park): In Ccachin, we are already planting potatoes at 4,500 masl but we have reached the top of the mountain, so what can we do? Water is already gradually reducing, so we need to plant native plants. We need to sow and harvest water.

Day 6: Policy forum on climate and agroecology

On 4 June an “international forum on climate change policies and agroecology in mountain regions” was held using a hybrid format. Alejandro Argumedo (ANDES/INMIP) introduced the forum as focusing on the crucial intersection of climate change, agroecology and Indigenous Peoples in mountains. He noted that IP’s food systems are linked to traditional knowledge systems. The forum discussed vulnerabilities and solutions that come from Indigenous knowledge. The forum focused on key threats facing mountain communities: the impacts of glacier retreat, false solutions for climate change, food and agriculture, the GMO moratorium law in Peru, and extractive industries. It provided food for thought for developing the INMIP Declaration.

Glacier retreat, water access and politics

Professor Ben Orlove of Columbia University presented the case of the community of Siete Imperios, district of Marcará, province of Carhuaz, Ancash region (Peru). Eucalyptus was introduced and the forest provides a lot of construction materials. But it uses a lot of water and has led to loss of underground water — there used to be more wetlands. As water has reduced, this has significantly impacted water flows to Lima. It also affects the community’s crops, they now need irrigation.

The community uses ancestral irrigation technologies (channels) for growing corn and potatoes. Every year they work together to clean the channels. All these practices include a ritual component — to the Apus (sacred mountains). Glacial melt creates very important wetland areas but there is also change in access to grazing pasturelands which has affected the communal economy. The National Park of Huascaran was established in 1975 and in 1976 the community got official recognition of their rights in this area, but a lot of rules are imposed about what they can and cannot do on the land.

There is a small flat area just below the glacier where the community prepare food and a traditional drink with sugar and grains. Once they arrive at a site like this they whistle to the glacier to let the mountain know that you are coming.

Glacier retreat is changing water availability a lot — it is very variable. What is ‘peak water’? Scientists are trying to decide what is the point at which water resources will decline. As climate change advances, you get more water because glaciers melt faster, but then you get less water as glaciers become so small. Peak water in the Andes has already past — they had more water in the past, so now the amount of water is decreasing.

Prof Orlove also presented the case of the Andean community of Copa Grande in the Ancash region of Peru. The community now has access to drinking water as a separate intake to the irrigation system — an important system installed with government funding and local labour. But there is a need to change water laws, rights and fees. Government voices influence these policies rather than Indigenous voices.

This community has access to pothole water and other groups wanted access to the stream that previously supplied communities. The stream is also the water intake for the town of Macara in the valley below. So a new reservoir has been built to serve the growing urban population. Does the water belong to the community or the state?

There are also government programmes promoting production of market crops like roses over food. These new crops create wage labour opportunities, but also inequalities in wealth. They lead to changes in ideas about who are the experts because these crops no longer require traditional knowledge, and use chemicals. To supply roses the programmes establish water reservoirs, which leads to unequal access to water. It also impacts community organisation through religion — there are lots of religious groups there.

Q & A

Q (Ricardina, Potato Park): In my community, and this is a tendency in the region, exotic species like eucalyptus have been planted and that has led to drying up of water sources and loss of traditional practices of sowing and harvesting water. If they change the exotic trees to native trees would that reverse the situation?

A: Yes eucalyptus takes a lot of water. Eucalyptus grows fast and provides wood for construction, but has displaced local species. But local species are very slow growing. Perhaps there are different ways to replace exotic species with local ones. Of course these decisions need to be made in the communities through meetings.

Ricardina: I am very worried about some of these plantations that are coming in strongly in the Potato Park and could affect water resources.

Victor (Chalakuy Park): In my community we've also planted a lot of eucalyptus and cypress trees. We have received a lot of trees but now we are seeing the impacts they are having. They take a lot of water, we didn't know that when we planted them. Some trees like pines don't die easily, and eucalyptus trees don't rot at all, their bark is almost like plastic. We planted about 100 ha with eucalyptus trees and all the bark stays there, and we recently realised the issues that come with this. Maybe there are some native species that we could use to replace those trees?

Alejandro (ANDES/INMIP): Glacier retreat is significantly affecting agricultural areas.

False solutions for climate and food

Soledad Vogliano from ETC group (Argentina) has worked many years in Andean region. She shared a few ideas about false solutions in food and agriculture. This analysis of false solutions should be part of the exploration when looking for real solutions.

What are false solutions for climate and food? Climate chaos is real for many people on the planet — it is a real challenge for famers. It is caused by the expansion of the industrial production and consumption model, based on oil, gas and carbon. We know there are real solutions but policymakers are not looking at them. Ten countries are the main problem, responsible for 71% of greenhouse gas emissions, including the US and European countries. Since 2010 China is the biggest emitter. The Kyoto Protocol was signed to address problem.

Industrial agriculture contributes a lot to climate change, producing about a third of greenhouse gases. Only about 20 companies control the entire food system. They only feed about 30% of the world or less, but use 75–80% of land and water. And agriculture accounts for a significant proportion of fossil fuel use in food systems.

What false solutions are being promoted by these companies? False concepts, market mechanisms and speculative technologies with high risk. What we really need to do is reduce emissions. False solutions include 'net zero' and carbon markets. Net zero assumes that we can maintain emissions at zero level by capturing the same amount of carbon as we emit. The idea that you can emit in one place and capture in another is really a con, promoted by major industries such as mining, that produce a lot of emissions and contamination. For example, China feels it can get to net zero by 2040–2060 through carbon capture, and the idea is that they can keep emitting. The solutions they are proposing haven't been tested or proven, such as climate engineering, and carbon capture and storage — gases are put into the earth but that is not really reducing emissions at all. So they just continue emitting and will inject carbon into the deepest part of the earth, and the same industries that are emitting can be compensated for carbon capture and storage.

Geoengineering for forestry and bioenergy is another terrible example for communities. The use of biomass for carbon capture and storage underground requires hundreds of millions of hectares of land. This is in direct competition with use of land for agriculture, impacts biodiversity and IP land rights, and is another way of promoting monocultures.

Another false solution is 'climate-smart agriculture' — this is really just taking agriculture and including it in carbon markets, partly due to the digitalisation of food systems, in alliance with big agribusiness. All the major digital platforms, such as Google, Amazon and Facebook are involved in promoting the digitalisation of food and agriculture systems, which is a common threat facing communities — for instance, the idea of using seeds and roots that are supposedly climate smart and can capture carbon as well. A lot of these digital platforms are promoting the same ideologies, and supporting this idea of carbon capture and markets (for example, the idea that certain seeds and roots are supposedly climate smart and can capture carbon as well). Bayer's Climate Field View digital farming platform has more than half the market for digital agriculture platforms — 180 million acres in 23 countries with at least 70 partners. These data points are as valuable as oil and minerals. They influence the way food is

produced but this has nothing to do with the way most smallholder farmers produce food. Instead of using traditional knowledge, this digitalisation is pushing people to use a different way of organising knowledge that fits these digital platforms. Rather than supporting different types of agriculture, it is pushing everyone into the same system.

False solutions waste our time, they are not really solutions. We know net zero, nature-based solutions, geoengineering and carbon markets are all false solutions. We should really be questioning these and mass consumerism. Seventy per cent of the world's population is fed by small farmers, artisanal fishers, pastoralists and hunter gathering — all this actually cools the planet.

Q & A

Alejandro (ANDES/INMIP): What about privatisation of seeds? Solutions that come from outside are really ways to privatise our food systems and reduce control of communities.

Krystyna (IIED): Why are nature-based solutions false solutions? A. Nature-based solutions and market-based solutions are false solutions because we need to stop emissions. If we continue to emit, a company can continue to pollute or contaminate and pay someone else, so neither solution is really going to change the way we work. We shouldn't start with the assumption that the ones polluting are also the solution. Just because a community participates in a nature-based solution project, it doesn't really address the root causes of the problem, so we are just adding more funding to problems which are not really solutions. And if we continue with payments for polluting, big oil companies will just continue producing oil, and companies are just inventing a number that acknowledges the pollution they are emitting. Also we should be more protective of those that feed 70% of the world's population, the small farmers. So we are investing a lot in solutions that are not working and should focus on real solutions.

Yiching (Farmer Seed Network, China): China is a big emitter because of industrial agriculture. It is also a problem for us working with communities. We need to pay more attention to small-scale family farmers and local communities as they make big contributions to local and global food security. In China there are more than 500 million small-scale family farmers, with an average of only 0.6 ha per household. Most are women and poor people, living in remote mountain areas. So we can't forget about them and they contribute to climate resilience. We need these communities to work together for climate resilience, food security and sustainability.

Peru's moratorium on GMOs

David Greenwood-Sanchez of Iowa University presented on Peru's moratorium on GMOs. He first explained what GMOs are. DNA is altered using genes from other plants or animals. 99% of all GM crops are big commercial crops — soy, corn, cotton and canola. There is very little production of GM crops in Europe due to concerns about health and link to cancer. Production is also very low in Kenya, but that is changing — they have just allowed production of GM cotton. But in the US and Canada where most multinationals producing GM crops come from, there is lot of GM production, and Brazil and Argentina are also big producers of soya. A couple of countries don't produce GMOs – Peru has a unique policy that prohibits domestic production of transgenic crops.

In 2011, Peru introduced a 10-year moratorium on GMOs by law. In 2020, it was extended by 15 years, until 2035. The moratorium also permits the state to develop its regulatory capacity for GMOs. It does not prohibit imports of GM crops, but prohibits experimental testing of GM crops, so scientific development can continue but it's regulated.

How did this happen? Peruvian civil society formed a broad, multisectoral coalition against GMOs, including chefs, environmentalists, consumer groups, agro-exporters, Indigenous groups and scientists — for example, there was a chef's campaign, 'biodiversity is our identity'. And there has been local resistance — in the late 1990s various GM crops started emerging in Peru including GM potatoes and terminator technology, which can stop potatoes from producing, and that was very controversial. The Cusco region was declared a GM-free zone, to protect a centre of origin of agrobiodiversity in the region including more than 4,000 varieties of native potatoes. Between 2007 and 2012 another 15–16 regions of Peru declared themselves as GM-free zones. Some producers from the Potato Park went to Lima to protest against GM potatoes — by washing potatoes as a symbolic act.

How were GMOs opposed?

1. Regional activism and the will of local people — 16 of 25 regions passed GM-free declarations.
2. Allies in Peruvian state — the Minister of Agriculture (Antonio Black) was pro-GMOs but the Minister of Environment was publicly against transgenics, so that opened a space for debate.
3. Framing the debate, and changing it — civil society managed to shift the narrative away from the issue of 'productivity' to GMOs as a threat to Peru's biodiversity, and to Peru's market opportunities.

As a result a moratorium was brought before the Congress in 2011 and passed unanimously. But it was not a complete rejection of GMOs, it was more for the state of Peru to have time to develop capacity to regulate transgenics.

How did the 2020 extension come about? INIA, the national institute for agricultural research, tried to allow transgenics. So civil society re-convened a 'Platform for Peru free of transgenics'. It used the same arguments again — the need to protect biodiversity, the lack of regulatory capacity in Peru, and limited mapping of biodiversity. How can we protect biodiversity if there is no map of agrobiodiversity in Peru or crop wild relatives? There was a case of GM contamination in corn in Piura but the state could not explain how it happened. As result, a 15-year extension was passed unanimously in Congress. A congressman said "Peru is the gene bank of agrobiodiversity of the world, and we need to protect it". Biodiversity is important for nutrition, cultural heritage and so on.

But on 28 May 2024, the new Minister of Agriculture (Manuel Manero Campos) presented a formal request to exclude GM maize and cotton from the moratorium, to allow planting in a few coastal areas, not mountains or forests, and only for animal consumption, not human, so it would not affect gastronomy. Domestic corn consumption in Peru has gone up a lot for animal feed — linked to rising meat consumption (for example, there are chicken restaurants ('pollerias') everywhere). There are growing GM corn imports in Peru.

What is the best strategy of resistance in the current political context? Producers of cotton in the north are against transgenics, and many maize producers are also against them as they want to defend their market. Transgenics are also developed to resist pesticides, and for resistance to drought. Industry has taken note of that as they are aware that GMOs are associated with chemicals. They are now developing pink quinoa to make it more attractive to consumers, but are not working much on drought-resistant GM crops.

Q & A

NGO participant (Peru): We don't want any kind of GM crops because we don't need it.

Q: Is there also a spiritual argument against GM crops? **A:** Yes, we can see that potatoes represent a way of life, a cosmovision. Crops mean many things for many communities and we must respect that.

Q (Paula, Bolivia): what is the nutritional value of GM crops? **A:** Different GM crops can have different genes that may influence nutrition, but 99% are produced to resist pesticides.

Q (**Yiching, Farmer Seed Network, China):** What is best strategy for change? In China they do the same, their argument is productivity. But we can argue that only focusing on productivity can undermine productivity in the long term. In China, the productivity of hybrid maize is going down because the genetic basis is narrowing. **A:** For that reason, we've seen strengthening of agroecology and many papers coming out on this, arguing that interaction with the environment can improve productivity compared to industrial varieties.

Q'eros community member: GM crops do not benefit farmers like us who are conserving biodiversity because we work in a traditional way and that traditional knowledge is maintained, but if we introduce a GM crop what will happen? It will bring in imports and the price for our crops will go down. They use chemicals for growing GMOs but we use bird waste, which is a natural product and is very cheap. We can just buy and sell local products.

Extractive industries and Indigenous rights in Peru

Hania Harmsen Villa of Centro Bartolome de las casas (Peru) talked about agriculture in the Andes, the expansion of mining, and agroecology as a possible alternative. There is agriculture from 1,500 to 4,000 masl. About 38% of the population of Peru work in agriculture, and in Apurimac region in the Andes it's 62.5%. Agriculture is often based on traditional knowledge, cosmovision and practices, such as terraces to prevent erosion, retain water and soil fertility, and these have conserved high diversity of crops. Farming is often based on rotation and mixed cropping (association), spiritual values (respect for Pacha Mama) and community cooperation. It is not only for economic benefits but also for food security and spirituality.

Farmland is decreasing and one reason is mining. There is a conflict in what the law says — that IPs are owners of the land they live on, but if concessions are granted by the state, they have the right to explore for mining. Overall, 14.78% of land in Peru is under mining concessions. In Apurimac almost 50% of land is under mining concessions. There are 93 Indigenous communities in one area of Apurimac and almost the entire area is under mining concessions. Impacts of mining are:

- **Environmental impacts:** pollution of water, soil and air — especially in open pit mining. It doesn't just destroy the soil, but also affects water sources, changes the whole topography, and creates residual lakes to filter contaminants, that are also very contaminated. Mines use a lot of water and that can affect the amount available for communities. They also create particulates and dust in the air, for example, due to many trucks. And they lead to loss of biodiversity.
- **Cultural impacts:** sometimes communities are displaced with very little compensation. Mining has very big impacts on community cohesion, and creates conflicts, and people are criminalised for their protests. Insecurity increases, as well as prostitution, petty crimes and impacts on women.
- **Economic impacts:** we know that a lot of people lose individual access to land. At community level there is reduced pastureland and crop land, and often the price of land is very low. Mining reduces water for agriculture and livestock, leading to reduced income. There is a myth that mining creates employment, but very little employment is created. The cost of living goes up but the benefits are not shared equally in society, and most benefits leave the community.

There are also human and animal health impacts, and mining affects the rights of IPs — violation of human rights, and when people protest their rights are often not respected. Mining also threatens the survival of biodiversity and traditional culture. Communities have rights to FPIC from the UN Declaration on the Rights of Indigenous Peoples (UNDRIP). There are also other declarations on rights of IP, and ILO 169 requires FPIC. But these rights conflict with other rights granted through mining concessions. Communities have historic links to land and rights, and these rural farmers are also feeding the world. Indigenous cosmovision is based on a vision that people and nature are inextricably linked, nature is not just a resource.

Agroecology provides an alternative to mining. It is a science, practice and social movement. It conserves agrobiodiversity and traditional knowledge systems and can also innovate and adapt, integrating new knowledge. Agroecology has several benefits:

- It improves food security and sovereignty, and reduces vulnerability.
- It is resilient to climate change and environmental degradation.
- It strengthens participatory processes and supports local self-sufficiency.
- It provides a way to support rights that Indigenous and local farmers are entitled to, especially in the face of extractive industries.
- It seeks to regenerate agroecosystems, social relations and traditional practices.

How to transition to agroecology? Governments need to recognise and support agroecological practices and finance these kinds of practices and protect and recognise traditional knowledge. They need to think about the relationship between policies and territorial management; and about agroecology as a tool for meeting different needs. They also need to support Indigenous initiatives with Indigenous governance systems.

Geoyachaq (Apurimac): We've been working in Cotabambas (Apurimac) for eight years working on food systems and capacity of communities to adapt to other threats. One way is by focusing on Life Plans for communities and looking for strategies that we can put into practice (communities already have these). Mining is a big threat, many people are starting to try to exploit minerals on their territories often to get quick economic benefits as they have few other opportunities.

Reflections on the previous session and elements for the Declaration

Maria Eugenia (ANPE, NGO, Peru): we've been thinking about our agrobiodiversity but had forgotten a bit about the risks. We must focus on actions to resist threats such as GM crops and mining.

Lino (Potato Park expert): In the Potato Park, we've been learning about conserving our traditional knowledge alongside the native potato. The potato has been managed until now with traditional knowledge and the Pacha Mama is everything together, so we are defending them against transgenics. In two communities we have mining concessions — mining would destroy everything. The Potato Park is already declared as a Agrobiodiversity Zone, which we hope will mean more support.

Victor (Chalakuy Park): Yesterday we were in Lares, we are conserving agrobiodiversity through the community seed bank. Anything could happen at anytime, there could be drought or rain. Our territory also has many mining concessions. GMOs will make us lose our customs. We don't want GMOs.

Mariano Sutta (Potato Park expert): It is very important for us to ensure our own voices are heard. We have heard presentations this morning. Based on these, I suggest that we must remember our community seed banks. These are going to be very important for us to maintain our agriculture, and continue our customs, but often the state is not very interested — they just focus on trade and money. So it doesn't matter what world you are in, if you are a scientist, or a partner or campesino, we need to think about nutrition. I get very sad because I see that in the countryside people are migrating, there are more and more people leaving and how can we maintain our traditions?

Ricardina (Potato Park expert): We feel bad because other communities here are not sharing with us. We want to know how things are in your countries, what you are doing. I have a question — there are so many false solutions, so how can we confront them? Maybe in your country you have experiences that we can learn from regarding false solutions relating to climate change. We have exotic trees that are consuming our water — we are trying to change this but we still lack in seeing really how to organise ourselves.

Paula (Samaipata municipality, Santa Cruz, Bolivia): When we talk about ecological agriculture, we have a law at country level which means we need to guarantee that we are growing organically/ecologically. This should also be the case in other countries. The law says that there must be no use of agrochemicals and farmers can get an ecological label that shows ecological practices have been followed in the field, and they have to be inspected regularly to ensure they are following the law. So each project has its documentation with information about where the food was grown and this ensures rules are followed. There are different groups of agricultural producers and once they have the ecological production label, we know they have to continue working to improve so the ministry can give them an ecological label. The law says we can't contaminate Mother Earth.

Kelly (Geoyachaq, Apurimac): I am happy we are focusing on climate change. It is real, it is happening in our communities every day but there is a total absence of organisations or institutions that can help us find solutions that are not false. We have a mining concession and I am very worried about what we can do if it goes ahead, we don't have alternatives. How can we confront the serious threat of mining?

Q'eros community member: I heard from the presentations that mining combined with climate change and the introduction of exotic species like eucalyptus is constraining water. Congratulations to the Potato Park and Chalakuy Park for having a solid organisation and infrastructure for seed banks — please can we collaborate so we can have this kind of infrastructure to conserve our seeds. In local production there is a lot of disadvantage — traditional crops are marginalised and denigrated and get a very low price. But when we consume foods from outside they come wrapped up and all communities are filling up with plastic.

Amaru (Potato Park expert): I was in Lima for the last few days for the national day of the potato. Farmers from all regions of Peru met there so I went as a representative of the Potato Park. I was in the

potato exhibition and had the opportunity to present work of the Potato Park. National authorities such as INIA came, and we exhibited our native potatoes. The Potato Park is recognised at national and international level. We had the opportunity to visit INIA and CIP — about 30 of us that participated went to see how they work. I also had the opportunity to present our three crop wild relatives — it was a festival of three days. This is an opportunity to thank our parents for teaching us to conserve native potatoes and to pass them to our kids so they are maintained.

Chemuku (KEFRI): We have learnt a lot. We have similar problems, a lot of mining — sand mining and quarrying for construction. These pose a lot of threats and problems for the community especially in Kaliang'ombe village. So based on that we can improve our process to establish a Biocultural Heritage Territory. We have many challenges as most land in Rabai is private land.

Alejandro (ANDES/INMIP): False solutions are entering agriculture quite a bit, such as climate-smart agriculture. CIP is promoting this, looking at how to take carbon markets to small-scale agriculture. Similarly, payments for ecosystem services are looking at how to compensate small farmers in a monetary way for conserving varieties. They say this is in some way contributing to climate change mitigation but in reality it is not a solution. These false solutions distract us, make us think we will make a lot of money, but in the end the communities lose their territories as has happened in the Amazon.

Omari (Kaya elder), Daniel (chairman of seven Kayas) and Rehema (community researcher), Rabai: As Ricardina asked to learn from other communities, we are going to talk about our Mudzini concept. It is like a homestead where Rabai community lives, it means unity. From long ago we lived in Kaya forests, it was our home, we lived together. In Rabai we have four Kayas — Mudzi Muvya, Bomu-Fimboni, and Mudzi Muiru (the first Kaya settled of Rabai) — they are our sacred places where we do our prayers. Each Kaya has a specific prayer. When we go to pray we have visions, and are shown if we will have good rains or bad rains, but this year were shown that there will be bad rains. When we go to Mudzi Muvya and pray, the diseases disappear and go, or we pray for bad omens to go. In Rabai we have a customary court where we solve our problems as the Rabai community. So when someone has a conflict they go to the highest person in the court who is Daniel. The court normally sits on Mondays to resolve conflicts. We also have our Chief — if a case can't be solved in the traditional court, we call them to help intervene to solve cases. So all that we have talked about is Mudzini where we live together in solidarity, unity and collectiveness as the Rabai community. We have seen the community in Peru that has their culture. We want to learn from them, and together we can bring our culture to a very high level. We have our new year celebrations in Rabai on 16 October. The Anglican church established by Dr Kraft in Rabai wanted to build his first church in Kaya Mudzi Muvya, but was told by the elders that their god is high and doesn't need a church.

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Annex 1: INMIP's vision, mission, values and objectives

Vision: A world rich in biocultural heritage that maintains the reciprocal and harmonious relationship among the spiritual, human and natural realms for resilient indigenous mountain communities.
Mission: Provide a global platform for exchange of knowledge and experiences and cooperative discovery for the recognition, protection and promotion of mountain indigenous biocultural heritage.
Values:

• Reciprocity — between network members and in relation to Mother Earth and the sacred

• Diversity — biological and cultural diversity are critical to the future of mountain peoples and the planet in these times of global change

• Cultural identity — focus on indigenous mountain communities

• Empowerment — of Indigenous Peoples to influence policy and to support local implementation of policies and practices for food sovereignty, rights to resources and knowledge

• Communication — for effective networking, sharing knowledge, experience and best practices, and to influence policies relevant to indigenous peoples, mountain ecosystems, smallholder farmers, the environment and climate change.

Objectives:

1. To establish networks of biocultural heritage territories and community seed banks and support international seed exchanges and collaborative activities.
2. To strengthen the capacity of indigenous mountain peoples for resilience in the face of global change by revitalising their biocultural heritage, particularly spirituality, indigenous knowledge, practices and customary laws.
3. To exchange knowledge, information, strategies and innovations for adaptation to global change and promote the intergenerational transmission of indigenous knowledge.
4. To advocate for policies at the local, national and international levels that recognise and protect: a) the integrity of communities, biocultural heritage and the environment; and b) the rights of mountain Indigenous Peoples, particularly of the role of women, youth, children and elders, based on a range of traditional resource rights, such as those included in the United Nations Declaration on the Rights of Indigenous Peoples and the International Labour Organization Convention 169.

Annex 2: INMIP's emerging global network of Biocultural Heritage Territories

Biocultural Heritage Territory and customary governance system	Biocultural Heritage Territory area size (ha) and land tenure	Customary sustainable use system	Biodiversity and ecosystems conserved	Status
PERU: Potato Park, Cusco Quechua — Sumaq Kawsay, Ayllu, Apus, customary law principles/values	**9,200 ha** Collective, secure tenure Agrobiodiversity Zone legally recognised	Millennial farming system, native pasture, land use mosaic	Andean wildlife, sacred mountains, native pasture Approximately 1,400 native potato varieties, 4 potato CWRs; Andean crops and livestock	**Fully established**
PERU: Chalakuy Park (Lares), Cusco: Quechua — Sumaq Kawsay, Ayllu, Apus, customary law principles	**50,000 ha** Collective, secure tenure (approximately 50% of land not farmed). Agrobiodiversity Zone (applied)	Millennial farming system, native pasture, land use mosaic	Sacred mountains, wild foods, wetlands, forests 90 maize and 400 potato varieties, CWRs; Andean crops and livestock	**Largely established**
PERU: Vilcanota Spiritual Park, Cusco: Q'eros — mountain gods (Apus) are highest authority	**6,970 ha** Collective, secure tenure	Millennial farming system, native pasture, land use mosaic	Sacred mountains, lakes; wetland; native forests Andean agrobiodiversity, native potatoes and CWRs	**Largely established**
PERU: Apurimac (Cotabambas)				**Initiated**
MEXICO				**Planned**
BOLIVIA				**Planned**
KENYA: Rabai Biocultural Heritage Territory, Kilifi County Mijikenda, Kaya Elders' Council, Mudzini (harmony with nature), customary laws	**20,000 ha** Private land; Kaya forests co-managed (devolved), industry	Sacred Kaya forests, traditional farming and agroforestry, land use mosaic	Four Kaya forests: tropical dry Coastal Forests Global Biodiversity Hotspot. Indigenous cowpeas, sorghum, millet; coconut, casava, maize landraces; CWRs	**Emerging**

KENYA: Taita Hills Taita Taveta County: Traditional *Mitengo* management system based on traditional cultural values	**35,165 ha** Private land; community forests co-managed and conserved by landraces (Mitengo catchments)	Community forests, sacred groves, land use mosaic, agroforestry, millennial terraced farming	10 mountain forests; global biodiversity hotspot; endemic trees, birds and butterflies. Traditional sorghum, millet, pigeon peas, green grams, roots, wild berries	**Planned**
INDIA: Rice, Bean and Orchid Park, Kalimpong, West Bengal Lepcha and Limbu Mountain gods and nature deities	**20,000 ha** Overlap with National Park (Neora Valley) — restricted access/use	Customary sustainable forest use (Lepcha Bukchung, Limbu Kipat), traditional farming system	Sub-tropical and temperate forests; sacred mountains, approximately 200 orchid varieties, 16 threatened mammals (eg red panda, Himalayan black bear) and birds, Global Biodiversity Hotspot 30 bean, dryland rice, aromatic rice, buckwheat, maize LRs, CWRs	**Emerging**
TAJIKISTAN: Apple Park and Orchard, Rasht Valley Community/village management	**c. 5,000 ha** Government-owned land	Traditional agroecological farming practices	Mountain ecosystems and wildlife 64 apple, 60 walnut, 36 pear, 24 apricot, 15 grape, 10 mulberry, pear and apple wild relatives	**Established**
TAJIKISTAN: Wheat Park, Bartang Valley, Pamirs Customary village management	**20,000 ha** (about 12 communities initially) Government land	Traditional agroecological practices	Pamir mountain ecosystems and wildlife Seven species and 151 varieties of wheat; including soft wheat	**Emerging**
CHINA: Three village Biocultural Heritage Coalition, Yunnan Naxi and Moso Dongba religion, balance and harmony with nature; holistic wellbeing; customary laws. Stone, Labo and Youmi Villages	**30,000 ha** (including river valley landscapes) Forest land is community owned; household land leased from state	Millennial terraced farming, land use mosaic, customary water and forest management	Sacred mountains, forests, wild food plants. 380 native varieties, including waxy maize, rice, wheat, millet, soybean, sorghum, barley and CWR of soybean, rice, buckwheat	**Emerging**

BHUTAN: Monpa Community in Trongsa District Own dialect/language (Monkha); Jangbi, Wangling and Phumzor villages	**57 ha** 70 households' privately owned land with an average of 2 acres per household. Inside Jigme Singye National Park	Customary sustainable forest use; places with strong emphasis on protecting environment	Sub-tropical forests; sacred mountains. Rice, maize, wheat, buckwheat, millet, vegetables, guava, mandarin	**Planned**
KYRGYZSTAN: Wild walnut forest, Jalalabad Province Self-governed	**50,000 ha** State land	Community forest management through renting	Wild walnut and fruit forests with CWR	**Emerging**
THAILAND: Karen Indigenous collective governance		Karen rotational farming and forest conservation	Tropical rainforest Rotational farming agrobiodiversity	**Emerging**
THE PHILIPPINES:Mintapod community Higaonon tribe	**14,000 ha** Ancestral domain title, ICCA	Customary forest management, traditional farming	Tropical rainforests Traditional rice, sweet potato, maize and cassava	**Established**
TAIWAN: Tayal 'Millet Ark' biocultural foodscape, Hsinchu County	**20 ha**	Indigenous natural farming system	Sub-tropical forests; sacred mountains Traditional millets	**Emerging**
PAPUA NEW GUINEA and NEPAL				**Planned**
TOTAL	**260,412 ha ++**			

Annex 3: Participants list

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