Local Actions:

Solutions to Global Challenges

Initiatives of Indigenous Peoples
in Climate Change Adaptation and Disaster Risk
Reduction Based on Traditional Knowledge

AIPP

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I. The situation of Indigenous Peoples in Asia

A. Background Context

While governments around the world continue to debate about policies and practices to address climate change solutions, they pay little attention to the situation of indigenous peoples who are among those most affected by climate change on the ground. Thus indigenous peoples are compelled to act and respond immediately to climate change impacts to reduce or minimize risk on their livelihoods. However, they still have very limited access to information and government facilities in terms of financial or technological support at the national and local levels.

Many of the worlds' remaining key biodiversity-rich and forested areas are those owned, occupied or managed by indigenous peoples who maintain their social and natural resource management systems that are able to absorb or resist external shocks. This is because indigenous peoples uphold a deep cultural and spiritual attachment to their land, territories and resources. Over the centuries, indigenous communities have developed various coping mechanisms and adaptation strategies to collectively respond to change.

Adaptation mechanisms developed by communities in response to change clearly outweigh state-designed adaptation strategies. For state adaptation plans to be more efficient oriented and responsive to community needs and priorities, governments need to recognize indigenous knowledge and incorporate indigenous peoples' perspectives on climate change and disaster risk reduction in their policy frameworks. This is the only way to ensure that indigenous peoples and their rights are properly considered, and their resilience enhanced in the long-term.

B. Indigenous Peoples' Assessment of Climate Change Impacts

Asia Indigenous Peoples Pact (AIPP), with the support of MISEREOR initiated extensive awareness raising and participatory assessments on risks, vulnerability, needs and priorities of indigenous peoples in 50 indigenous communities in five Asian countries, including Thailand, Lao, Malaysia, Indonesia, and Philippines.[1] Assessments showed that the main risks induced by climate change that are faced by these communities are floods, extended dry periods, droughts, tidal waves, increasing frequency and intensity of typhoons, whirlwinds, tsunamis, volcanic eruption, earthquakes and landslides. The extreme events are causing severe impacts on the communities, such as food shortage, scarcity of drinking water, soil and coastal erosion, malaria, pest infestation, destruction of agricultural fields, houses, and properties. Moreover, communities often remain cut off from basic support services for long periods.

However, the project's participatory assessments also revealed that even though indigenous peoples are facing increasing disaster risk and exposure, they have intricate knowledge on how to cope with or adapt to changing climate.

More than the impact of climate change, their distress is from the threat they face from the non-recognition of their distinct identities, denial of access to agricultural land and criminalization of traditional occupations, illegal logging, mining, and the intrusion of market economy in their villages such as the fishing companies, tourism and monocrop dependent farming systems. More often now, they are concerned with their immediate needs, such as earning cash income to meet their basic household requirements and to afford their children's education.

Indigenous peoples comprehend climate change as an inevitable global phenomenon where they have negligible contribution. But the denial of their rights and entitlements has severe consequences to them which actually weaken or impair the practice of their adaptive capacities to change.

This briefing paper is based on information and insights gained from the three-year project implementation, including the community assessments, as well as the two regional knowledge exchange programs Adaptation Learning Highway (ALH) participated by indigenous knowledge holders from 9 countries in Asia including Thailand, Malaysia, Indonesia, Philippines, Lao PDR, Vietnam, Myanmar, North East India, and Nepal. Drawing from these experiences, the paper is about collective responses on nature-based solutions, indigenous peoples' adaptive strategies and measures to climate change-induced hazards in South and South East Asia, as well as on socio-cultural and political barriers that hamper the implementation of these practices.

Forest Iventory exercise during ALH, Nueva Vizcaya, Philippines

C. The Specific Vulnerability of Indigenous Peoples to Natural Hazards

Indigenous peoples are disproportionately affected by climate change, and their greater vulnerability is rooted in a range of different factors[2] largely external or on weak policy implementation.

Geographical location: Indigenous peoples often inhabit physically isolated, risk-prone and exposed ecosystems which are most threatened by climatic uncertainties and extreme weather events (typhoons, floods and droughts), occurring with increasing frequency and intensity such as in the case of Coron in the Philippines and Kumo Island in Indonesia.

> *"This year alone, we already experienced four floods and landslides in my village because of the typhoons, but we cannot leave our ancestral land. We will adapt to these hazards and risks disaster".- Benita Suguitan from Canarem Village Palawan, Philippines*

Intimate Relationship with Nature: Traditional livelihoods of indigenous communities such as agriculture, livestock, fishery and other natural resources depend heavily on climate and are sensitive and vulnerable to even minor weather changes. Moreover, as their close relationship with nature forms the basis of their socio-cultural systems, their spirituality and identity as distinct peoples, effects of global warming and adverse changes to the ecosystem threaten their physical and cultural existence.

Poverty, Social and Economic Discrimination: In addition, denial of their rights and entitlements drastically affects or impairs indigenous peoples' ability to cope with the impacts of climate change, including the immediate aftermath of climate change disasters. For example, they often experience unfair treatment regarding urgently required emergency aid. The loss of life and property frequently remains unrecognized and unacknowledged by the majority society. Often, poverty, as well as the lack of access to financial and technical resources and communication facilities makes it more difficult for them to cope with the negative consequences of natural hazards.

Impacts on Women: Vulnerabilities are not equally distributed between and even within communities, and often indigenous women are disproportionally affected by climate change impacts and disasters. Indigenous women are not only the main food providers for their families, but also responsible for domestic chores, including fetching, storing and distribution of water. Water shortage forces women to search for water sources in long distances from their homes. In case of emergency, they are often left behind as they face prohibitions to leave the house unaccompanied, or because they have to care for the children and the elderly.

Exclusion from decision making process: Indigenous peoples are made vulnerable, on one hand, by their continuing lack of involvement in decision making processes as well as in the design and implementation of mitigation initiatives at the national, regional and international levels. On the other hand, climate change policies political processes and regulations often also exacerbate the negative effects of climate change on indigenous peoples. They prevent indigenous peoples from successfully responding and adapting to changes and weaken their coping strategies and thereby their resilience. For example, poorly designed agricultural policies and climate change mitigation measures can weaken the customary rights of indigenous peoples to their lands and natural resources, such as the conversion of indigenous peoples' land into mono-cropping plantations (bio-fuels), or the state's declaration of protected areas in their territories without their consent that pose serious threats to their food security, traditional knowledge and social-cultural integrity.

In this sense, the lack of integration of indigenous voices into climate change policy also often involves the criminalization of indigenous peoples' sustainable agricultural practices. Moreover, there are cases of forced evictions or displacement of indigenous peoples from their traditional territories as a result of mitigation measures such as the creation of protected areas. Often, indigenous peoples report that the threats posed by climate change mitigation policies are even more detrimental to them than climate change itself. As a consequence, climate change policies often exacerbate difficulties already faced by vulnerable indigenous peoples, such as their discrimination, political and economic marginalization, and the encroachment on their land and resources.[3] As they are often deprived of resources for their physical and cultural survival, their capacity to deal with hazards is further weakened.

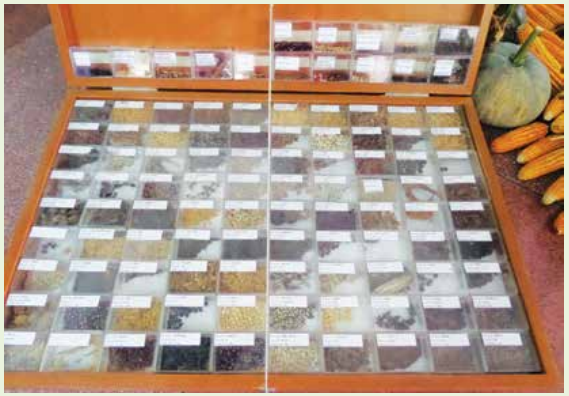
II. Indigenous Peoples' Practices on Climate Change Adaptation, Disaster Risk Prevention/ Reduction in Asia

Many indigenous communities in Asia pursue their own strategies to cope with the adverse effects of climate change. Over generations, they have preserved and passed down their traditional knowledge and practices to prepare for, cope with and manage climatic changes. Their practices have evolved based on their intimate relationship and direct experience with the environment and spiritual and cultural belief systems.

A. Conservation efforts to ensure food security and food sovereignty

Indigenous food systems are always supplemented by the resources from the surrounding environment which is protected and managed sustainably by indigenous communities. Often, they develop diversified resource bases, allowing them to draw on various alternative food sources rather than depend only on one. Moreover, as a response to increasingly unpredictable climate patterns, indigenous communities are developing measures to protect their resources from harmful practices and pollution by continuously improving their regulations and monitoring activities.

- Changes in the weather pattern, such as storms and extended dry periods with an increasing frequency and intensity threaten the agricultural productivity and food security of indigenous communities in Northern Thailand (e.g. Karen, Lisu, Lahu, Hmong). Their plight is compounded by government restrictions to practice shifting cultivation which is their traditional livelihood. As a response, the indigenous peoples in Thailand have collectively decided to preserve their traditional crop varieties and started to collect seeds, to document their quality and quantity and to set up home gardens that will serve as complementary food or gene banks to field agriculture, and host a variety of different crops and herbal plants. For them, it is a strategy to ensure their food security in the face of climate uncertainties and the restriction to practice rotational farming. According to them, traditional crop varieties are more resistant to varied weather conditions and can withstand such changes. Moreover, the seed diversity has cultural and spiritual significance and plays a key role in the communities' health and therefore is a way of safeguarding their food sovereignty.



Seed collection by Thai IPs

- One of the indicators of healthy environment for indigenous peoples is good quality of water. Aquatic resource management systems are a part of traditional resource management among indigenous groups where resources are nurtured and harvested for community food supplement. In this system, the community as a whole develops norms and regulations for harvesting and managing the resources. In the upper Mayog, Sabah, Malaysia, communities practice the "Tagal System "where the river is divided into red, yellow and green zones to designate areas of different degrees of access to riverine resources . The red zone is a strictly prohibited zone of the river that serves as a sanctuary for aquatic life, whereas green zone is regulated but open to the whole community and yellow zone is a special reserved zone for pregnant women, elderly or sick person. The community protects the catchment and water runways from sewage and other pollutions. Similar practices of water resource management and the conservation of aquatic lives of indigenous groups in Thailand are called **Lue Tee** in Karen and **Achaluwa** in Lisu. Practices similar to Tagal, Lue Tee and Achaluwa are called **"Sasi"** in Indonesia. Through the Sasi system, Pagu and Gura communities in North Maluku protect and maintain mangroves as spawning and foraging areas for aquatic lives. As adaptation measures and to protect their main sources of food and food sovereignty, communities have access and none access zones for fishing and classified mangrove types and species based on their traditional knowledge. They have come up with marine biodiversity and traditional resource harvesting inventories to avoid over exploitation of resources. Moreover, they are putting tremendous efforts to monitor overhar vesting from fishing companies and pollutions from mining companies.

Exposure at Tagal site during ALH in Sabah, Malaysia

Tagal Fish

B. Cultivation practices as natural barriers and shields

Certain plant species can serve as natural barriers and shields against climate change-induced natural disasters.

- In Sabah, Malaysia, the indigenous Dusun of the Upper Moyog Communities face heavy precipitation and floods. Moreover, widespread soil erosion in the area (e.g. caused by large-scale rubber plantations) leads to more frequent landslides, causing damage to houses and crops. As a counter measure, the community members make use of traditional knowledge while planting. They practice mixed plantation of cassava and bamboo species in landslide prone areas. The soil binding rooting system of the bamboo protects the area against landslide and prevents further erosion while cassava serves as food source for the communities. Further, Dusun communities have systematically planted banana trees as natural fire breaks (*Mongulat*) and as preventive measure against droughts and forest fires that destroy their crops, natural and forest resources. Banana plants contain a high proportion of water, which prevents the fire from spreading further. At the same time, it is a nutrient-rich food crop.

- In Northern Maluku, Indonesia, Gura communities face widespread coastal abrasion and erosion, tidal waves, tsunamis, floods, and typhoons. As counter-measure to this trend of hazards, the communities reinforce shoreline protection by systematically engaging in mangrove plantation and restoration work, building Talud (wave breakers) and drainage systems based on their traditional knowledge. Besides serving as natural shield and protection from the hazards and risks, mangroves are also spawning areas or sources of food.

Mangrove restoration work in Gumu Island, North Maluku, Indonesia

- In the mountain region of North East India, strong winds and extended dry period or drought are a common phenomenon. The Naga communities plant bamboo for windbreak and the native banana variety in the catchment or water source areas. The banana crops discharge continuous supply of water in the areas where found. Besides having several medicinal values ,the stem and flower serve as food supplement, fodder or dye and the leaves are used as wrapper,

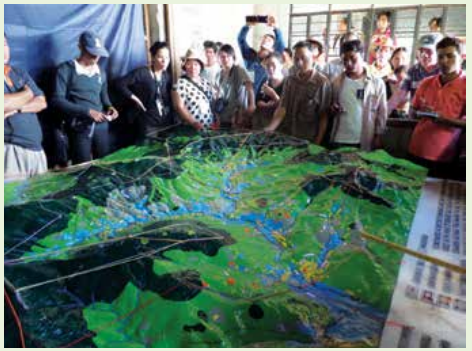
C. Conservation of Natural resources based on ethical, religious and spiritual values

- In Vangma, Lao PDR, communities are hit by drought and water scarcity. Thus, they have established forest conservations areas and undertaken huge aforestation efforts aimed at the development of a "green community." They have established a forest conservation area and planted mixed varieties of tree crops to provide an additional organic food source that enhances their food security in the face of natural hazards. According to their traditional belief system, the protection of nature and forest implies the attainment of spiritual knowledge and social harmony. Besides, they also want the future generations to inherit a green village with a rich forest and without food and water scarcity.

- *"I have organized my villagers and we planted about 5000 saplings, a mix of fruit bearing and other tree species. Doing this gives me a sense of fulfillment for my spiritual life". -Khamyeun Samphachit, Chief of Vangma Village, Sangthong, Lao PDR*

- In Coron Islands in Northern Palawan, Philippines, the traditional concept and practice of TeebSurubliyen of the Tagbanuas refer to the "territorial sea inherited from the ancestors." It is considered as the home of the spirit-a giant Panyaan or giant octopus. This belief makes the sea around Coron Island a sacred site and only designated areas are accessible for fishing and foraging. Other areas are protected as fish sanctuaries or carefully avoided or respected as zone. By identifying their Teeb Surubliyen and consistently managing these as sacred, the local community helps in preventing the entry of commercial fishing and mitigating the harm that poses risks to life and livelihood.

- In Imugan village, Nueva Vizcaya in the Caraballo mountain range of the Philippines, the area is frequently hit by typhoons and landslides. The Ikalahan-Kalanguya communities have maintained a forest reservation which is the pride of the community, and they regularly monitor the health of the forest. They do so by identifying key stones and indicator species in the forest. They have developed well-regulated harvesting plans, and they pay respect to the spirits of the forest when they harvest forest resources. The community has developed an efficient land use plan and practices multi–tier land use patterns in accordance with the elevation slopes. They maintain the top elevation slope as a catchment forest, the middle elevation for agro forestry or orchards, and the subsequent elevation for settlement with home gardens and paddy fields at the bottom valley. Owing to rich forest cover, the community is rich in water resources, and is mindful of the people living downstream.



P3DM for territorial management, Nueva Vizcaya, Philippines

Ikalahan man

D. Early warning and Monitoring Systems

For early warning and preventive measures, navigation and monitoring, indigenous peoples rely on nature (bio indicators), such as reading and understanding the behavior of animals, birds and insects or natural objects surrounding them.

- Among the Pagu and Gura communities in Indonesia, "Nanaku" is the sign of nature and animal behavior to determine the changes in the season. "Nanuka" is the knowledge to predict an event that will occur based on the knowledge of their experiences before. According to their reading, the arrival of Korehara (local name) birds to the mangrove area on the islands of Kumo, Tagala and Kakara, is a sign of change of wind direction and the beginning of the rainy season. Likewise, the coming of the Maleo birds (Macrocepalon maleo), is a sign of change in the sea water level. The typical sound of this bird indicates the significant changes in the sea level. Interestingly, the arrival of the Luo-luo (local name) birds to the mangrove area on the islands of Kumo and Kakara indicates the abundance of fish in the sea, as these birds come to the islands to find food (fish). People often use this sign to find the species of fish that will be caught in the sea. Similar to Nanuka is "Mangele," the knowledge to observe the position of the clouds above Mount Dukono which is presently an active volcano. According to their reading, if the clouds are straight and thick that covered the top of the mountain, it is an indication of strong winds, big waves, and very strong currents. People must not venture into the sea or go fishing during such weather conditions.

- Pagu and Gura communities also read the signs of a tsunami this way: If there is sudden low tide with strong smell of salt from the sea, the emergence of sea bubbles in large quantities followed by a loud roar from the sea with high black and long wave. People who see the signs will hit the "toleng-toleng," a communication tool made of bamboo or iron and hit it loudly and repeatedly as a sign of impending danger on the island.

Fishing trap of Pagu community, North Maluku, Indonesia

Fishing in Kumo Island, North Maluku, Indonesia

- For the Tangkhul community In North East India, the advent of giant earthworms after the dry period is a sign of rain. The communities predict drought by the behavior of animals that live in burrows for example, the erratic appearance of pangolin towards the end of winter or beginning of spring is a sign of drought or late monsoon, while the high content of moisture level (urine) in their burrow is a sign of good rain. The annual climatic forecast of the community is done by observing the weather pattern during the seed sowing festival towards the end of January. The community identifies two types of rain pattern called "rem".[4] Their prediction is more related to the average weather conditions like the optimal rain that will result in good harvest, drought or changes of rain pattern that will disturb the plantation period or flowering period of their crops.

Tangkhul Naga during seed sowing festival, North East India

- In Nasaonang village in Laos, the K'Hmu and Puan communities have developed their own flood monitoring system as a response to frequent floods, drawing on their traditional knowledge and experiences. They use bamboo sticks to regularly measure and monitor the water level in the river. Based on the changes of the levels, they are able to predict danger and to warn the community in time.

E. Traditional Techniques to Protect Water Source

- In Bhotang village, Sinthupalchok District of Nepal, it is a tradition of indigenous communities (Gurung, Danuwar, Tamang, and Newar) to build and maintain ponds to preserve water resources. These water conservation ponds store water and replenish groundwater reserves. The traditional way of constructing a pond is entirely based on local knowledge, making use of very cost-effective tools (e.g. specific plant species) and technologies (e.g. the storage of rainwater or groundwater). The traditional practices bear high value for the off-seasonal use, guaranteeing water availability throughout the year. Besides being an important water resource, the water repository has intangible values and high cultural, aesthetic, and spiritual significance. The plantations around the pond serve as strong wind break and protect hillsides from soil erosion and landslides during the rainy season, which are some of the main problems in hilly areas. At the same time, the traditional and indigenous plantations provide shade and moist soil suitable to grow smaller plants. The area serves as a favorable habitat for many plants and animal species, e.g. as a shelter for birds, insects, and amphibians.

- In Nasaonang village, Santong District, in Laos, K'Hmu and Puan communities have constructed a small dam in order to improve off-season irrigation. The villagers collect water during the rainy season and use it during the dry season or during droughts for their livestock and agricultural field. The water storage makes them less vulnerable to extended dry period.

F. Traditional building and soil retaining technologies

Tangkhul Naga House, North East India

- On 5 May 2014, an earthquake measuring 6.3 on the Richter scale struck the northern part of Thailand. Hundreds of aftershocks caused significant infrastructural damages and destroyed houses, temples, schools, roads, and bridges. Several hundred indigenous households of the Lisu, Akha, Lahu, Karen, Mien, and Bisu peoples in Northern Thailand were adversely affected by the earthquake. In DoiLan, one of the earthquake-stricken indigenous Lisu villages in Chiang Rai Province, the quake caused much destruction, including damage to many concrete houses. In contrast, traditional Lisu houses were flexible and strong enough to resist earthquakes. Traditional Lisu houses are made of locally available resources like wood and bamboo and technology based on their knowledge, are cost-efficient and resistant to earthquakes.

- Mud house technique is common among many indigenous groups but is now being replaced by concrete building. However in Nepal, many communities build their houses using locally available insulating materials such as mud, bamboo or boulders mixed with straw or cow dung for walling and thatch for roofing. These types of house regulate room temperature, keeping cool in summer and warm in winter.

Ghale Mud House, Nepal

- Stone wall technology is common in the mountain regions of many indigenous communities such as Ikalahan and Ifugao communities in the Philippines and the Naga communities in North East India. With good judgment on the type or quality of the soil, the wall is done meticulously by squarely placing slabs of rocks one over the other to retain soil in most inhospitable or rugged slopes and terrain. The technology allows water seepage while keeping the soil from erosion and landslides. This time-tested practice of hydraulic engineering is proof of pure indigenous traditional sense and knowledge.

Indigenous stone wall technique, Nueva Vizcaya, Philippines

G. Community-based disaster management measures

- Northern Maluku, Indonesia: The Pagu Community faced flood, drought, earthquakes, whirlwinds, typhoons, forest fires, and malaria. They conducted an inventory of services available in various departments for emergency response and started with land restoration activities, building temporary shelter, shoreline protection and wave breaks. On their island, the Pagu communities have a zoning system with rules within each zone. Each zone has a local name according to the function, such as *"Gorua zone"* (Protection zone), *"Tagerobongo zone"* (rehabilitation zone I), *"Dowora zone"* (rehabilitation zone II), "Modorou Berera zone" (rehabilitation zone III) and use zone. This zoning system is to protect against the exploitation of natural resources and to avoid disaster or hazard from abrasion or erosion.

Buidling Break wave in Gumu island, North Maluku, Indonesia

- Sabah, Malaysia: The community is coming up with a protocol on land use, listing good practices, zoning of resource use, and using only organic pesticides and fertilizers.

- Nasaonang village, Santong District, Laos: In response to the frequent floods in their areas, the K'Hmu and Puan indigenous peoples have built a bridge based on their traditional knowledge. All three communities, consisting of K'Hmu, Puan and Tai dam/Tai deng indigenous peoples have created women savings groups. The groups allow women to take loans from the groups' savings, and to gain a greater degree of control and recognition. According to their financial abilities, all villagers contributed to the bridge construction. Thus in case of flooding, the bridge allows the community to cross the river to reach a safe area, and to quickly relocate their livestock and property.

Community grain bank in Lao, PDR

- Sikdim village, Sangkhuwasava District, Nepal: The village is mainly inhabited by indigenous Kulung and a smaller number of indigenous Bote peoples. In 2009, the village was hit by a massive landslide that caused the loss of lives and property, washed away farmlands and destroyed houses. Official emergency relief actions by the government were not immediately available. The local indigenous peoples rescued many disaster victims by bringing them into the safety of the nearby stone caves which they are familiar with, as they used these as storage for crops and as shelter during the rainy season. Only indigenous peoples are knowledgeable about the caves, while outsiders largely avoid them for fear of danger.

Despite the vast body of knowledge that indigenous peoples have accumulated, governments, policy makers, development agencies and disaster management institutions continue to systematically overlook and discard indigenous knowledge and the indigenous peoples' sustainable and effective climate change adaptation practices and innovations, often in favor of "Western" scientific technologies of disaster response and risk reduction.

III. Major Legal and Institutional Barriers Preventing Indigenous Peoples from Implementing Disaster Management and Prevention Initiatives

A range of socio-cultural and political obstacles as well as legal and institutional barriers limit the capacity of indigenous peoples to effectively cope with the impacts of climate change and natural disaster. These factors aggravate the already existing vulnerability of indigenous peoples and make it impossible for them to implement their disaster risk reduction and adaptation strategies.

The governments' lack or non-recognition of indigenous peoples threatens the latter's security and right to land and resources and further weakens their capacity to deal adequately with natural disasters. Due to the lack of recognition and protection by States, the security of their persons, their properties, land and resources are constantly under threat.

For example, Thailand's national laws do not recognize and protect the rights of indigenous peoples and their distinct identities. Moreover, approximately 296,000 indigenous peoples are still not in possession of Thai citizenship.[5] Accordingly, they have no or limited access to government services, health and education facilities. The absence of citizenship also deprives them of other basic rights, such as the right to unrestricted travel, and to vote. They cannot own land, and are therefore more vulnerable to forced evictions and relocation. With the lack of tenure rights and the violation of land rights, social vulnerability to natural hazards also increases. Without legal recognition, indigenous peoples thus face multifold barriers to the implementation of their traditional climate change adaptation practices.

Highland beans, Thailand

Indigenous technique for cucumber. This helps to preserve cucumber for six months, North East India

B. Political Marginalization

Their political marginalization additionally weakens the capacity of indigenous peoples to adapt to environmental hazards as they frequently lack information on climate change policies and interventions and have no voice in decision-making processes. Their needs and priorities are easily ignored because their full and effective participation in the design, implementation and evaluation of mitigation and adaptation measures at the local, national and international levels is limited. Accordingly, adaptation plans often do not benefit them, and instead, even strengthen existing inequalities. Political processes and regulations also prevent indigenous peoples from successfully adapting to changes and weaken their coping strategies and resilience.[6]

The marginalization of indigenous peoples from climate change policy and decision-making processes is also mirrored in the lack of references to existing indigenous traditional knowledge on climate change in the international climate change discourse. Their adaptation strategies, skills and knowledge remain largely ignored by the technical and scientific approaches of the climate change policy apparatus.

In some countries, the over-all political situation, e.g. civil and political unrest, poses additional challenges to the situation of indigenous peoples and hampers them to apply their climate change adaptation measures. For example, in Sabah, Malaysia, tensions caused by nationwide elections led to dissent among community members as well as the disengagement of indigenous leaders from community activities that could falsely be attributed as politically motivated, often out of fear of jeopardizing their positions.

Pagu way of food processing, Northern Maluku, Indonesia

C. Expansion of Protected Areas and Denial of Access to Livelihood Assets

The enactment of various laws and the demarcation of protected areas (e.g. national parks, conservation forests, or wildlife sanctuaries) in indigenous territories without the indigenous peoples' consent have severe impacts on the communities residing in the forests. The state forest regulations have led to a dramatic reduction of their agricultural land and the practice of agro-ecology traditional cultivation practices, like the shifting cultivation. Though there is solid evidence that the indigenous peoples' practice of shifting cultivation is enhancing biodiversity and providing livelihoods and food security to indigenous communities, it is considered as a major cause and factor of deforestation and forest degradation by states, and thus, legally prohibited in many countries in Asia.[7] The indigenous peoples' loss of access to natural resources is associated with loss of their traditional occupations, knowledge and practices. Moreover, there are cases of forced evictions or displacement of indigenous peoples from their traditional territories. Violent evictions frequently result in hunger, poverty and depression, and the forest dwellers often face various human rights violations such as arrests, threats, and seizure of land by military and forestry officers. To cite, in June 2014, Thailand's National Council for Peace and Order (NCPO) issued a Policy on the Reclamation and Restoration of Protected Areas nationwide (NCPO Orders 64/2014 and 66/2014).[8] One of the policy's main objectives is to increase the forest areas to 40% within ten years. Though the NCPO has claimed that the Orders' main targets are investors and large-scale land encroachers, many small-scale farmers in Thailand's North and Northeast were prohibited from using their farmland, land plots have been confiscated, and the villagers were to receive court summons for alleged encroachment or for possessing illegal logs.[9] In September 2014, national park officers enforcing the order destroyed rice and corn fields of the indigenous Lisu of Huay Hok village in the Huay Num Dang National Park, causing anxiety and distress among the villagers, as this posed serious threats to their food security.

Indenous territories, Northern Thailand

D. Competition over Resources and Unsustainable Resource Extraction

The continued depletion of land and natural resources through illegal logging, mining and plantations, contributes to gradual changes in climatic patterns, and thus, enhances the risk of natural disasters. In Sabah, Malaysia, large-scale plantations, mining and logging operations as well as extensive land opening negatively affect the livelihoods of many Upper Moyog communities. The traditional Tagal system in Notoruss village, for example, is threatened by a Chinese landowner's hill cutting and construction operations as the muddy run-off of the hill-cutting activities cause widespread pollution of the Moyog river.

In Northern Maluku, Indonesia, *PT Nusa Halmahera Minerals* (PT NHM), an Australian gold mining company, operates an open pit mine in the indigenous Pagu territory. PT NHM started its activity in 1997, without any consultation with the indigenous Pagu people. The mining activities have been causing widespread pollution in the entire territory, as well as the loss of indigenous forests and livelihoods of local people. Several rivers and ocean areas in the Pagu territory have been poisoned with cyanide and mercury. Furthermore, recurrent leaks at the wastewater disposal pipes of PT NHM caused the contamination of Kobok and AkeTabobo rivers, the main water and traditional food sources of the communities. A number of villagers have reported health problems after the consumption of fish and water from the river.[10] The examples illustrate that the unsustainable practices of resource extraction industries threaten local livelihoods and compromise the rights and health of indigenous peoples. Moreover, they further exacerbate the indigenous peoples' particular vulnerability to climate change and weaken their capacity to cope with natural hazards.

IV. Creating Convergence: Integrating Community Needs and Priorities

There is a growing awareness of the significant contribution of indigenous peoples' traditional knowledge and practices to finding solutions to climate change for both mitigation and adaptation, for disaster risk reduction and for the maintenance and promotion of biodiversity. However, because indigenous peoples lack access to formal governmental decision-making bodies, their adaptation measures, rich indigenous knowledge, specific needs and priorities are often overlooked or discarded. The lack of understanding and recognition of community-based climate change adaptation strategies and innovations are reflected in the often highly divergent perspectives of governments and indigenous peoples. The non-consideration of traditional knowledge leads to a mismatch between disaster plans and priorities of the government and those of the communities. For example, as an emergency response system, a community intends to build a bridge in order to relocate their property and cattle in case of flooding, while the government intends to set up an automated flood warning system in the area.

Pagu women harvesting rice., North Maluku, Indonesia

Moreover, specific needs of communities are overlooked sometimes, leading to divergent prioritizations. To illustrate, the restrictions on the access to livelihood assets may pose a bigger and more immediate challenge for indigenous communities than the effects of climate change, as they may no longer be able to sustain their livelihoods. In this sense, it is crucial to identify community needs and priorities, to assess the different perspectives of all stakeholders involved, as well as to develop strategies and measures to reconcile them.

The various good practices of indigenous communities in Asia show that indigenous peoples contribute significantly to the design of effective mitigation and adaptation solutions, as they have developed affordable and practical measures based on their sound, time-tested, traditional ecological knowledge. Indigenous peoples can be important partners in mitigation and adaptation planning due to their rich traditional knowledge and the vital role they play in the maintenance and promotion of biodiversity and the wider eco-system. Thus, Governments at the national and local levels can genuinely learn from and work with indigenous communities, especially because of the years of experiences and practices in monitoring the effects and impacts of climate change.

Community dance in Ikalahan Village, Nueva Vizcaya, Philippines

V. Conclusions and Recommendations

To Governments

- National policies should incorporate indigenous perspectives on climate change and disaster risk reduction to develop a policy framework that enhances the resilience of indigenous peoples and respects their right to self-determination, right to participate in decision-making and their right to their lands, territories and resources. It is crucial to engage indigenous communities in the design and development of climate change adaptation and disaster risk reduction and prevention policies at the local, national, regional and international levels.
- Governments should ensure the full and effective participation of the indigenous peoples throughout the process of incorporating successful indigenous knowledge into disaster reduction and prevention measures. In this context, it is crucial to consult with local communities about the impacts of climate change, as well as about their specific issues, needs and priorities.
- States should recognize indigenous institutions and obtain the indigenous peoples' free, prior and informed consent before implementing climate change adaptation solutions, e.g. disaster management measures that impact on their traditional land and livelihoods.
- A thorough review of national laws has to be undertaken in order to identify and rectify all provisions that hamper indigenous peoples from making use of their efficient traditional knowledge and practices on climate change adaptation, e.g. laws on protected areas.
- Potential impacts of resource extraction policies and activities on the rights of indigenous peoples and on their specific vulnerability to natural disasters have to be analyzed thoroughly and systematically documented.
- It is essential to improve the collection and disaggregation of data on climate change impact, vulnerability factors and adaptation practices of indigenous peoples in order to gain a deeper understanding of the link between climate change-induced natural hazards and the situation of indigenous peoples.
- Data on hazards, vulnerabilities, risk assessments and protection options have to be made readily available to the indigenous communities in their indigenous languages, and the information has to be disseminated by appropriate (i.e.,traditional) ways of communication.

To Academe and Research Institutions

- Research is needed on the indigenous peoples' traditional knowledge and good practices related to disaster risk reduction and prevention, as well as on the specific vulnerability, needs and priorities of communities. This includes also the elaboration of strategies on how to replicate successful practices in other contexts.
- The mutual recognition and convergence of scientific research and indigenous knowledge should be strengthened. While scientific research focuses on certain segments of the reality in a segregated, logical, and organized way, indigenous knowledge provides a more holistic and comprehensive picture of the situation. By closely intertwining both forms of knowledge, complementary and synergetic effects can be achieved.
- A curriculum should be developed on indigenous knowledge and community-based adaptation and disaster risk reduction.

To NGOs

- Local and international NGOs should engage in awareness raising and support mobilization in order to improve the access of indigenous peoples to decision-making processes. They should facilitate the interaction between indigenous peoples and governments for the former's promotion of their rights and disaster management strategies.
- Good practices and experiences of indigenous peoples in the combat of climate change should be exchanged and propagated at the regional and international levels.
- Community-friendly IEC materials should be developed, produced and distributed for building capacities of the indigenous communities on climate change and recent developments in international negotiations.

To IPOs

- Indigenous peoples' organizations should advocate their rights and assert their demands by highlighting their role as stewards of the natural environment and biodiversity, and their contribution to humanity as a whole.
- Indigenous peoples should actively participate, enter the dialogue, and engage with national and international institutions and bodies to share their knowledge and successful practices for climate change adaptation and disaster management.
- At the community level, it is important to conduct capacity building training and participatory vulnerability assessments to identify new or frequent hazards as well as enhance successful adaptation practices. Prevention and risk management plans should be developed with the participation of all community members.

Adaptation Learning Highway (ALH)

[1] This MISEROR-funded project on the promotion of traditional knowledge, techniques and innovations in combating climate change is titled: 'Building resiliency of indigenous communities on climate change adaptation'
[2] European Parliament, Directorate-General for External Policies of the Union (2009) Indigenous Peoples and Climate Change.http://cmsdata.iucn.org/downloads/european_parliament_study_on_indigenous_peoples_and_climate_change.pdf
[3] http://cmsdata.iucn.org/downloads/european_parliament_study_on_indigenous_peoples_and_climate_change.pdf
[4] Rem is a local rain pattern in the Tangkhul communities in North East India that continues to rain for days non-stop in multiple of 3 days which goes up to 12 days
[6] http://cmsdata.iucn.org/downloads/european_parliament_study_on_indigenous_peoples_and_climate_change.pdf
[7] http://aippnet.org/index.php/publication-sp-2697/environment/briefing-papers/1455-briefing-paper-on-shifting-cultivation-livelihood-and-food-security-new-and-old-challenges-for-indigenous-peoples-in-asia
[8] While Order 64/2014 stated that the encroachers into protected areas shall be punished according to the law, Order 66/2014 stated that the poor and settlers who have lived in areas
[9] http://www.prachatai.com/english/node/4618; http://www.prachatai.com/english/node/4919
[10] AIPP partners report :Alliansi Masyarakat Adat Nusantara (AMAN)- Indonesia

AIPP at a glance

The Asia Indigenous Peoples Pact (AIPP) is a regional organization founded in 1988 by indigenous peoples' movements as a platform for solidarity and cooperation. AIPP is actively promoting and defending indigenous peoples' rights and human rights; sustainable development and management of resources and environment protection. Through the years, AIPP has developed its expertise on grassroots capacity building, advocacy and networking from local to global levels and strengthening partnerships with indigenous organizations, support NGOs, UN agencies and other institutions. At present, AIPP has 47 members from 14 countries in Asia with 7 indigenous peoples' national alliances/networks and 35 local and sub-national organizations including 16 are ethnic-based organizations, five (5) indigenous women and four (4) are indigenous youth organizations.

Our Vision

Indigenous peoples in Asia are living with dignity and fully exercising their rights, distinct cultures and identity, and enhancing their sustainable management systems on lands, territories and resources for their own future and development in an environment of peace, justice and equality.

Our Mission

AIPP strengthen the solidarity, cooperation and capacities of indigenous peoples in Asia to promote and protect their rights, cultures and identities, and their sustainable resource management system for their development and self-determination.

Our Programmes

Our main areas of work among the different programmes are information dissemination, awareness raising, capacity building, advocacy and networking from local to global. Our programmes are:

- Human Rights Campaign and Policy Advocacy
- Regional Capacity Building
- Environment
- Indigenous Women
- Communications Development
- Organizational Strengthening

Through our Indigenous Women (IW) programme, AIPP aims to empower indigenous women through networking, education and capacity building activities with the overall goal for indigenous women to assert, promote and protect their rights as women and as indigenous peoples.

AIPP is accredited as an NGO in special consultative status with the UN Economic and Social Council (ECOSOC) and as observer organization with the United Nations Framework Convention on Climate Change (UNFCCC), Convention on Biological Diversity (CBD), Green Climate Fund (GCF), Global Environment Facility (GEF) and the World Intellectual Property Organization (WIPO). AIPP is a member of the International Land Coalition (ILC).

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