
Community Dialogue:

Indonesia

Natural Resource Management
and Indigenous Peoples



Northern Lombok, West Nusa Tenggara

September – October 2007

Glossary of Terms

Paer	Unity based on territory, local value standards (socio-cultural system) and unity based on regulations (<i>awiq-awiq</i>)
Mangku	Customary leader
Penghulu	Religious leader
Aji Lawat	Indigenous ceremony accompanied by reading from the Koran with short prayers to the Prophet
MKAD	Majelis Krama Adat Desa (village indigenous council)
Krama	Standard rules
Awig-awig	Basic regulations based on consensus
Paer Daya	Indigenous territory in the north of Lombok
Wettu Telu	Local three-tiered system of governance (Pemusungan, Penghulu, Mangku): Village Head, Headman, and Leader
Pemusungan	Village Head
Wet	Region
Tau (tu)	People/ person
Belian	Traditional magic man
Toak Lokak	The rank of indigenous elder, leader
Muja	Request (related to rituals)
Taon	Wet season
Balit	Dry season
Roah	Traditional ceremony
Bedugul	Construction and irrigation
Pawang	Customary forest where rituals are performed
Gawah	Common term for forest area

Contents

1. Introduction	4
2. Method of Documenting 'Good Practices'	5
3. Background on Northern Lombok	6
4. Customary Forests	7
4.1 Management of Customary Forests	7
4.2 Indigenous Institutions	8
4.3 Indigenous Rituals	9
4.4 Indigenous Regulations	10
5. Key Findings	11
5.1 Indigenous Peoples' Communities	11
5.2 Forest Resource Management	13
6. Analysis	14
6.1 'Crisis of existence' of Indigenous Peoples	14
6.2 Synergizing Differences	15
7. Conclusions and Recommendations	16
7.1 Conclusions	16
7.2 Recommendations	17
Annex. Elders' Story	18

1. Introduction

This report summarizes the key findings of a project supported by United Nations Development Programme (UNDP) Regional Initiative on Indigenous Peoples' Rights and Development (RIPP) and implemented by Aliansi Masyarakat Adat Nusantara (AMAN) and its member organization Perekat Ombara in Lombok, West Nusa Tenggara, Indonesia. The aim of the project was to draw out concrete examples of the stewardship roles of indigenous peoples in climate change and in retaining their cultural and traditional landscapes.

The Lombok Community Dialogue, conducted during September and October 2007, is one of a series of six Community Dialogues to take place through 2007-2009 on indigenous peoples and natural resource management. They focus on areas rich with bio-cultural diversity: in Lombok, Indonesia (the current report); the tropical forests of Sabah, Malaysia; the sloping terraces of the Cordillera region, Philippines; the swidden fields of northeast India and the Chittagong Hill Tracts in Bangladesh; and from northern Australia.

The six Community Dialogues form part of a broader, inter-linked multi-dimensional strategy initiated by UNDP-RIPP in 2005 on *Natural Resource Management and Land*. The aim of the overall programme is to provide a space for meaningful dialogue between policy makers and indigenous peoples on natural resource management and cultural sustainability. The strategy includes the Community Dialogues, a Regional Dialogue, held in Chiang Mai, Thailand, in November 2007, and a Global Dialogue, complemented by pilot projects on sustainable bio-culturalism and adaptation to climate change.

The results and momentum of the Regional Dialogue and Community Dialogues will be shared, and inform the Global Dialogue at the 7th Session of the UN Permanent Forum on Indigenous Issues, April 2008, with the theme: *Climate Change, Bio-Cultural Diversity and Livelihoods: the Stewardship Role of Indigenous Peoples and New Challenges*.

2. Method of Documenting ‘Good Practices’

A key element of the Community Dialogues is to draw out good practice to stimulate sharing and learning country and regional experiences.

The aim is to draw out concrete examples of the stewardship role that indigenous peoples are playing in climate change and in retaining their cultural and traditional landscapes. Documentation involves young indigenous leaders acting as facilitators, tasked with gathering stories from elders and senior members of their communities, to ensure these wonderful experiences and life lessons are shared widely for emulation and inspiration.

The following process was followed in the documentation of ‘good practices’ in northern Lombok during September-October 2007:

Selection of young indigenous facilitators: Twenty indigenous youth from different villages were selected to facilitate the documentation process. They helped in preparing the Elders’ Story Outline, Video Outline and the Work Plan.

Preparatory meeting with elders: This took place in the villages. Facilitators outlined the project to the elders and agreed upon a work plan.

Training on documentation (video making and writing): A team of professional film makers and writers were hired to provide training for the facilitators. Elders were also invited to provide inputs and suggestions.

Documentation: The facilitators documented elders’ stories over three weeks. The process included video recording, interviewing and discussion with elders. The drafting of the Elders’ Story took place over one week.

Community dialogue: A Community Dialogue was held on 5 November 2007. The aim of the gathering was to provide a space for discussion and exchanges in challenges and strategies in preserving their natural environment and cultural identity. A draft of the Elders’

Story was also presented at the Community Dialogue, to allow the community to discuss and validate what had been documented. Representative elders, youth and women engaged in a lively interactive discussion.

Finalization: Based on feedback and suggestions from the Dialogue, the Elders' Story and video documentation were finalized over two weeks.

The process resulted in a description of how natural resources have been used and managed over the years, and the response of the communities to climate change. The Elders' Story included as an annex to this report illustrates the vision of one elder in meeting this challenge.

3. Background on Northern Lombok

The northern part of West Lombok, which stretches from Pemenang District to Bayan District, is located between 115.46 longitude east and 79.50 longitude south. The 805.16 square kilometer territory consists of five districts and 32 villages, with a total population of approximately 215,000. Almost half of the villages (about 14) are situated in close proximity to, or within, Mount Rinjani forest. Most of the indigenous peoples who live along the edge of the forest work as farmers and depend on forest products for their livelihoods.

The northern part of Mount Rinjani covers an area of approximately 125,000 hectares, consisting of five key zones: (i) protected forest; (ii) limited production forest; (iii) production forest; (iv) tourism forest and (v) nature preserve; and national park. The forests of northern Lombok cover 42,249 hectares, some of which abuts the area of Mount Rinjani.

The Rinjani area has high biological diversity. It is the buffer zone for the lives and an income source for indigenous peoples in the region. Northern Lombok is unique in that it has state forests as well as customary forests, where are divided into *pawang* and *gawah*. *Pawang* refers to a sacred forest associated with 'big trees' and springs, and is maintained as a conservation area. *Gawah* means 'forest suitable for planting or cultivation'.

Bentek and Genggelang villages, two key sites for the documentation of elders' stories, are located in Gangga District. Both villages are part of the Rinjani area with a total population of 18,384. Livelihoods of the villagers varies: some are hill forest farmers; some grow paddy in the low-lands; and others are craftsmen or traders. Predominantly they are 'forest farmers', cultivating different crops such as cacao, cloves, vanilla, and bananas. They also gather forest produce, such as rattan, for sale in the local market.

4. Customary Forests

4.1 Management of Customary Forests

In the context of forest management, indigenous peoples have their own system to maintain and manage their forests by taking into consideration the natural balance of the environment. The relationship between indigenous peoples and forest is both social and spiritual. The social aspect reflects a relationship that ties the community together based on a shared inter-dependence with the forest environment. Religious and cultural practices are manifest in the spiritual relationship with the forest, which provides the focal point for community rituals and ceremonies. Therefore, management of customary forests is focused as much on conservation and protection—of springs, animals, plants, and sacred sites, etc— as it is on extraction and use.

Management of natural resources by indigenous communities under the *awig-awig* (customary law) relies on strong indigenous institutions. The content of the *awig-awig* is divided into three dimensions:

Tapsila governs the relationship between environment, society, nature and human security.

Krama manages the relationship between family and friends, and promotes marriages.

Gama manages ritual procedures, traditions, and religious practices.

Forest management, by way of customary law, is only applicable in customary forests, not in state forests. Customary forests in the area of Bentek and Genggelang are currently as follows:

- Buani Customary Forest (0.38 ha)
- Baru Murmas Customary Forest (5.50 ha)
- Mejet Customary Forest (35 ha)
- Bebekek Customary Forest (4.5 ha)

Community members of *Baru-Satan-Kalipucak* manage Buani and Baru Murmas customary forests, while the Islamic community manages Bebekek and Mejet customary forests. Buani and Baru Murmas are located outside the area of state forest, while Bebekek and Mejet are located in state forest. Alongside the customary forests in Bentek and Genggelang there are also state forests designated for agricultural production, as well as forests designated for inter-cropping. Some state provincial forestry programs have been implemented using the government's social forestry scheme, but they tend to focus on profit maximizing activities and are not as concerned with conservation efforts. Customary forests existed before the country gained independence, but the areas included in the state forests were determined by the government in 1982-1983. Since then, management of the forests has caused tension over the zoning of customary forests. In the case of Bebekek, there has been almost no government intervention in the management of the forest, but there are ongoing problems in Mejet (which the government claims to be protected forest free from human activities). In fact, many of the areas now designated state forest were originally managed by indigenous peoples.

4.2 Indigenous Institutions

Indigenous institutions are divided according to regional level, with the *Majelis Krama Adat Desa* (MKAD), the highest village organization, dealing with disputes, especially minor claims. MKAD also makes regulations (*awig-awig*) at the level of village. Under MKAD, the *Majelis Krama Adat Dusun* operates at a lower level. Other indigenous organizations are established according to their functions and duties.

Within indigenous communities, leadership is based on levels of responsibility called *mangku*. The duties of the leaders are divided into three categories:

Mangku Gumi deals with matters of agriculture and irrigation.

Mangku Segara manages coastal and ocean resources.

Mangku Alas deals with and maintains forest areas.

At the level of implementation, responsibility is shared depending on function or task:

Mangku Pengulu is the highest leader; leads indigenous rituals.

Mangku Pesalin: duties include decorating the ritual place and organizing ritual equipment.

Mangku Tunang Taekang: duties include carrying things of worship during the rituals.

Belian is in charge of initiating rituals by reciting relevant passages.

Pemekel is in charge of protecting and managing the community based on customary law.

Toak Lokak Satan is in charge of leading indigenous rituals in Pawang Buani.

Toak Lokak Belimbing is in charge, together with Mangku Pengulu, of leading indigenous rituals in Baru Murmas (assistant of Mangku Pengulu).

Toak Lokak Lonang is in charge, together with Mangku Pengulu, of leading indigenous ritual at Baru Murmas (assistant of Mangku Pengulu).

Mangku Tulup, together with other leaders, is in charge of rituals at Baru Murmas.

Inan Jerujeng is in charge of managing offerings used in the rituals.

Indigenous elders meet to nominate and elect leaders. Criteria for selection are mainly based on experience and expertise as well as family background. Elected leaders are then inaugurated with a ritual attended by the whole community.

4.3 Indigenous Rituals

Indigenous peoples maintain rituals handed down by their ancestors. The ritual is used in managing and protecting customary forests. Buani and Baru Murmas customary forests are sites for indigenous rituals, while Bebekeq, Makam Berangkak and Mejet are used by the Islamic community. The following are examples of some rituals:

Islamic community rituals: *Aji-Lawat* is for the safety of the earth. Recitals from the Koran last all night, with special greetings offered to the Prophet Muhammad. *Sedekah Gumi Paer*

is to show gratitude to God. *Roah Balit* is held in the dry season, asking for rain. *Roah Bedugul* is to show gratitude to God for the harvest. *Selamat Jelinjing* is held annually.

Buddhist community rituals: *Muja Taon* is held in the dry season to ask for rain. *Muja Balit* is held at the end of the year to show gratitude to God for the blessings by offering things obtained during the year.

In Bebekek the Islamic community has a management system similar to the Buddhist community. The indigenous ritual *Aji Lawat* is held once every nine years at Makam Berangkak. *Sedekah gumi paer* is held once a year by the Islamic community at Makam Bebekek. Other rituals are held at Makam Bebekek, attended by both Hindu and Buddhist communities.

4.4 Indigenous Regulations

The management of customary forests is arranged according to the *awig-awig*. One of the provisions is that,

whoever damages and cuts down trees on purpose either inside or outside the customary forest shall be sanctioned by replacing and planting ten young trees of the same kind and paying fifty thousand rupiah including one healthy black goat and one healthy white goat.

Sanctions are imposed according to the level of violation. The process of sanctioning violators is called *menyowok*, with the purpose of restoring balance to the community by 'cleansing' the violator. Community leaders carry out important roles when they enforce the *awig-awig*. Leaders invite indigenous elders to a meeting to decide on the case and appropriate remedy. Sanctions determined during the meeting are almost always accepted by the violators, when they have breached social rules or rules governing the forest. The peoples' respect for indigenous regulation is a major strength that makes it possible to sustain the forests.

5. Key Findings

The following sections outline the key findings that resulted from the dialogue process. Findings are based on discussions with elders and community interaction.

5.1 Indigenous Peoples' Communities

Indigenous peoples of Bentek and Genggelang villages still maintain indigenous customs and values, belonging to *Persekutuan Adat Bebekeq* (the Bebekeq community). 'Bebekeq' is the name of one of the forest areas in which both villages are located. It is also a symbol of the villagers' strength and values. Hence, both villages share the same rituals and religion. Two such rituals are *Aji Lawat* and *Sedekah Gumi Paer*, carried out in the Bebekeq forest. Other rituals are carried out in Baru Murmas and Buani customary forests.

Indigenous institutions and customs are still very influential in the daily lives of the Bebekeq peoples. They live in groups in small kampongs called *banjar*, while the borders between *banjar*, called *paer*, form the unity of territory, local values (socio-cultural systems) and customary laws (*awiq-awiq*).

The history of the indigenous community in both Bentek and Genggelang is one of inseparable unity, starting with the history of Bebekeq as the center for rituals since the 17th century, during the spread of Islam in Lombok by Gusti Lanang Berangkaq and his descendants. Berangkaq's efforts focused on three fields of indigenous governance: government, religion, and custom. Historical evidence, including an ancient Koran made of wood, knives for circumcision, among other artifacts are still kept by Berangkaq's descendants.

Berangkaq's descendants divided into two communities: an Islamic community, and the Boda Community. The Islamic community is known as Waktu Telu, while the Boda community is also referred to as 'Buddha' community. At present, the people in Bentek and Genggelang follow three different belief systems: Islam, Buddhism and Hinduism. Hindus in both villages are originally from Bali.

Waktu Telu community

Waktu Telu is identified as the Islamic community; however, they are often considered to practice an 'adapted' form of Islam. They reside in Seelos, in Bentek, and were converted to Islam by the government in 1967. Nevertheless, this community still conducts an ancient ritual called *Aji Lawat* once every nine years at the Berangkaq cemetery.

Boda community

'Boda' refers to the indigenous peoples who used to be animist. They live in Tanjung and Gangga districts. The Boda reside in the regions of Baru Murmas and Buani, in the village of Bentek. The Boda belong to the wider Sanpak, Panasas, Kalipucak and Barusatan communities, followers of Buddhism. They carry out their rituals in the customary forests of Buani and Baru Murmas. Rituals are held twice a year and are called *Nunas Kaya* and *Mulek Kaya* (or *muja taon* and *muja balit* in the Sasak language).

In 2000, the Boda split into two sects: *Teravada* and *Budayana*. *Teravada* is considered conservative and tolerant of other religious elements, especially indigenous beliefs, while *Budayana* is reformist and firm in the implementation of Buddha's teachings.

The introduction of Islam and Buddhism has influenced the attitudes and customs of the daily lives of the peoples in both the *Telu Waktu* and Boda communities. Nevertheless, the two communities live side-by-side harmoniously. The harmony and close relationship is based on religious values under the umbrella of indigenous law, or MKAD (*Majelis Krama Adat Desa*), the village council that manages the relationship between the two religious communities. As a result, indigenous rituals held at Makam Bebekeq, called *Sedekah Gumi Paer*, are attended by all religious communities living in both Bentek and Genggelang.

Religious turbulence after the 30 September 1965 Communist Movement in northern Lombok triggered a traumatic experience in which the government took action against followers of animism and *Waktu Telu*. The government passed a regulation that required villagers to choose one of the official religions. In 1967 the government carried out a plan to 'perfect' Islam, with the support of the police and army. A cadre of volunteers, members of the umbrella organization TKS-BUTSI, were also sent in as part of the government's strategy

to purify Islam in the region. Members of TKS-BUTSI, in their quest to make Islam perfect, renamed *Waktu Telu* as '*Waktu Lima*' (perfect Islam).

These actions, condemned as an abuse of the human right to choose one's religion freely, forced some members of the Boda community to isolate themselves in the mountains in order to maintain their beliefs. Other Buddhist followers fled to Buani or Baru Murmas, while others went to Bentek, the district of Gangga, or to places outside Bentek.

5.2 Forest Resource Management

Historically, indigenous peoples in northern Lombok separated the forest into two categories: (a) *Pawang* refers to forest with 'big trees' and a spring, and is used for cultural and religious purposes. *Pawang* is protected forest; and (b) *Gawah* is used for farming and other forms of economic production, by way of shifting cultivation (*mengoma*). There are only a few big trees in these forests.

The two categories were maintained until about 1981 when the government granted a logging concession permit (Hak Penguasaan Hutan/HPH) in 1992. As a result, shifting cultivation could no longer be practiced. Indigenous peoples' conservation and spiritual practices have since been limited to zoned customary forests.

The forest management with HPH could last for seven years. When the HPH permit system was first launched, it covered a concession area of 40 percent of forests. In 1999 as a result of severe logging and the resulting deforestation, there was a flash flood that destroyed many hectares of rice fields. The natural disaster triggered anger among the villagers, who mobilized a large demonstration to protest against the HPH. This resulted in the collapse of the HPH system.

After one of the HPH concession owners (HPH PT Angka Wijaya Raya Timber) left the forest, villagers began to clear away and reclaim the forest. They also began to plant industrial trees like coffee, cacao, durian, among others. Unfortunately, an individual system of managing the fields, without good governance structures, has led to a widening of the

reclaimed fields, and may lead to further destruction of the forest area. Even before the HPH owners left, some of the people had already entered the forest area to cultivate farms. This was without government approval and forest rangers then began to evict them from the forest.

When the forest is managed by the indigenous peoples, the forest remains intact and sustainable. In the implementation of community-based forest management, there is an *awig-awig* (customary legal agreement) among the groups. Based on the *awig-awig*, the farmers do not cut down and burn trees. If this is contravened, the responsible villager is sanctioned by the community according to the customary system.

The Regency Forestry Office of West Lombok sets regulations for the management of production forest by the indigenous peoples. Under the regulations, forest industry—previously dominated by fruit trees and small plantations—increased the numbers of wood trees using *tumpang sari* system (alternating system).

6. Analysis

6.1 ‘Crisis of Existence’ of Indigenous Peoples

Although rituals carried out to uphold the *awig-awig* system are still effective and obeyed, the indigenous peoples themselves suffer from a crisis of existence due to internal and external factors.

Within the community, indigenous existence is threatened by a decreasing sense of belonging and of identity among youth, especially in terms of customs. This is believed to be due to the spread of print and electronic media marketing modern and Western ways of life. Youth come to believe that only through modern technology can the nation become advanced and developed. Elders observe that the youth are obsessed with modern technology and ideology, to the point that they think their indigenous values are out-dated. Elders suggest that there needs to be a transformation of knowledge, philosophy and

customs so that young people understand their indigenous values and are proud of their own culture.

Externally, *awig-awig* is not strong enough to regulate incursion by outsiders. Yet, when there is a violation from outside the community, such as damage to the forest through the removal of flora and fauna, state law has also proven ineffective. Implementation and enforcement of the law by the government is weak. Elders suggest that, in the case of forest management, the government and indigenous peoples have a conflict of interest, which will only be resolved if both sides cooperate and systematically manage forest sustainability.

6.2 Synergizing Differences

In the context of natural resources, and especially sustainable forests, indigenous peoples possess some strengths that guarantee a more sustainable approach. If government and indigenous peoples establish a working synergy, these strengths could be harnessed to overcome government weaknesses in the area of sustainable forest management.

The following are identified as the **indigenous peoples' strengths**:

- Indigenous institutions are still obeyed by the community;
- The community is relatively small and may more effectively control behavior internally;
- Community members respect the enforcement of indigenous law, which has been shown to be firm but fair; and
- There is a space for dialogue among community members to mediate conflicts.

These strengths mirror the **government's weaknesses**:

- There is a significant disparity between the number of officers and the total area of the forest, making it difficult for officers to protect the forest;
- Law enforcement is weak. There have been many instances where state regulations have been violated without repercussions; and
- Various programmes implemented by the government in forest areas have not had positive impact or made substantial contribution.

The strengths and weaknesses of both sides can be **synergized** in the following ways:

- The lack of officers can be overcome by distributing the management rights (not the possession rights) to the indigenous communities, and not to individual members of the community.
- The objectives of forest management can be established by agreement between government and indigenous organizations. The indigenous organizations can be responsible for sanctioning community members. Based on the experience in the customary forest, indigenous institutions are very capable of firm sanctioning.

In the long term, if a synergy can be realized, both government and indigenous peoples will benefit.

There are also a number of state laws that may be used to support policy initiatives, if they are combined with strong implementation on the ground. The relevant legal framework includes: the Forestry Act 1999; Circular S 75, from the Minister of Forestry in 2004, regarding indigenous regulations and compensation for indigenous peoples; and the Agrarian Regulations/ Chief of National Land Agency's (BPN) Resolution 5 (1999), which sets out guidelines to settle indigenous peoples' land claims. In the case of north Lombok, the West Lombok District Regulation, acknowledging indigenous peoples and their customary forests, must be promoted as a model for future recognition of indigenous peoples' rights.

7. Conclusions and Recommendations

7.1 Conclusions

1) The management of customary forests (*pawang*) by indigenous peoples is directed by the interests of society, culture, and conservation of natural resources, while state forest management is oriented towards economic production and sustainable conservation. However, there is not enough evidence showing that the management of forest by the government, either by self-management or privatization schemes, is sustainable.

2) Indigenous customary systems and social institutions in the sustainable management of forest resources can be accommodated in the formal system. This will increase the potential for the government forest management to succeed.

3) The management of forests by the government has certain basic weaknesses that can be addressed by using indigenous systems and institutions. On the other hand, the crisis of indigenous peoples' existence due to the influences of globalization as well as the threat from external parties may be overcome if efforts are supported by formal laws and regulations, which the government has the authority to adopt and implement.

4) There are strengths and weaknesses on both sides that can be overcome through a synergy that may be used to achieve sustainable forest management.

7.2 Recommendations

1) Indigenous systems, institutions, and rituals that are functional and carry sociological and ecological benefits need to be maintained, promoted and sustained. The efforts should come from the people.

2) The role of indigenous institutions must be intensified, especially when dealing with internal matters of the indigenous community. The role and support of the government to these institutions should be made strengthened, in particular when dealing with external threats.

3) Increased awareness building and transmission of indigenous history, identity and cultural values to younger generations will lead to a revitalization of the role of indigenous institutions, organizations, and the community as a whole.

4) There needs to be greater efforts to establish youth-based institutions that include activities to attract young indigenous peoples to study their own culture. One of the requirements to ensure the participation of young people is that they have to be designed to appeal to the young, modern, and technologically savvy generation.

5) The efforts to build a synergy between the government and indigenous peoples must be carried out by opening intensive dialogues aimed at reducing the negative attitudes and misconceptions of both parties.

6) The policies that reinforce and support the existence of indigenous peoples need to be continually strengthened by indigenous peoples themselves, especially by making use of indigenous representatives in the executive and legislative institutions.

Annex. Elders' Story

The following account on the *Impacts of Climate Change on Indigenous Peoples' Natural Resources and Livelihoods* was provided by Mr Karmadi, an elder from Rinjani Mountain area of West Lombok, Indonesia, during an interview for the Community Dialogue held in Indonesia in 2007.

Ecology and natural resources

Average temperatures now reach up to three to four degrees centigrade more than before. Seasonal patterns are less predictable: the rainy season has changed since 1999 (as far as I can remember), sometimes arriving earlier or later. The water level in the river goes down very fast in the dry season, and causes flooding in the wet season.

In 1999, flooding caused damage to more than 40 hectares of paddy fields in West Lombok. In the same year, clove production dropped by 40 percent of total annual gain. We have given up counting how much we lost from that particular disaster. Since 1999, flooding has occurred every year.

In the dry season, water sources no longer provide as much as they used to. This has led to water shortages for both domestic and irrigation purposes. Indigenous women, who have the main responsibilities over domestic care, have to walk further to collect clean water and for washing. Also, during the dry season, the number of conflicts over water irrigation has increased dramatically.

Another example of how climate change has affected us: we would usually produce cash crops once a year at the end of the dry season, and the young plants would get enough water at the beginning of the wet season. Since seasonal patterns have become less and less predictable, the plants now usually dry out during the longer dry period, before late rains arrive. The change to wet-dry seasonal patterns has also caused a resurgence of pests and diseases that attack rice and other agricultural plants (clove, cacao, banana, etc). During 2004-2005, the banana trees were severely damaged by cancer. We had no option but to remove and burn all of our banana trees.

Social and cultural impacts

The northern part of West Lombok is about 805.18 square kilometers. 90 percent of the indigenous peoples who live within and around the Rinjani Mountain area are directly dependent on the forest resources from farming and gathering the forest products.

At the same time as the capacity of forests and farming land is decreasing, productive forests and land are being given to private investors. As a result, indigenous peoples, dependent on these forests and land, are earning less and less income and reaping less and less food from subsistence farming. More children are dropping out of school due to financial burden, and we can no longer afford medical care as we used to. More and more women give birth at home instead of going to a proper clinic.

Some villages fight over land and access to the forest. Since there are no alternative income sources, logging has become popular as a *quick cash* opportunity for some within the community, with support from government and security officers. Our indigenous sustainable forest management system has been overruled by unsustainable practices and over-utilization.

Another reaction to the lack of income in the community is for villagers to leave. Men move to the cities nearby, working in construction or any other job that can make use of their labor. Women have become migrant workers, mostly in Malaysia and Middle Eastern countries. These women face many problems abroad. Some never come back.

Other impacts

Besides being rich in biodiversity, Rinjani area is also an eco-tourism destination. Some of the attractions are Segera Anak Lake and fresh water rafting. Since the water level has gone down, tourist numbers have also dropped. Rafting activities face no future. Lombok Inter-Rafting, a community based tourism company with close partnerships with indigenous peoples, had to close its activities a couple of years back.

According to an assessment conducted in 2001 by WWF, Forestry Agency, Gunung Rinjani National Park Authority and Mataram University, if the Rinjani area is managed in a sustainable way, economic revenue can reach approximately 5,178 billion Indonesian Rupiah per year. This ideal estimation is certainly an incentive to encourage greater indigenous management of forest and watershed areas.

Successful strategies for adaptation to climate change

- 1) We developed communication among indigenous communities living along the water bodies (rivers, streams, lake). This was based on the idea to inter-link peoples living up- and down-stream.

- 2) We have established indigenous forums on forest management and conservation, including: KMPL (Kelompok Masyarakat Perduli Lingkungan); TPKH (Tim Pengelola Konservasi Hutan); KBPH (Kelompok Bersama Pengelolaan Hutan); KMPPH (Kelompok Masyarakat Peduli Pengelola Hutan).

- 3) We have empowered and revitalized the indigenous forest safe-guard system called *Lang-Lang Jagat* in each community. Safeguard groups are coordinated under our indigenous organization *Persekutuan Adat Lombok Utara* (Perekat Ombara).

- 4) Reforestation. This activity covers a wide range of activities including planting *Ara*, *Beringin* and *Koak* trees in water catchments areas.

- 5) Agriculture system. We plant diverse crops (poly-culture) and rice planting starts only in December every year.

- 6) Natural fertilizers and pesticide are now used more frequently.
- 7) To increase the economic value/ price of our agricultural products, we have introduced new post-harvest treatments.

These strategies should be supported as success stories in meeting the increasing problems to natural resources by climate change.