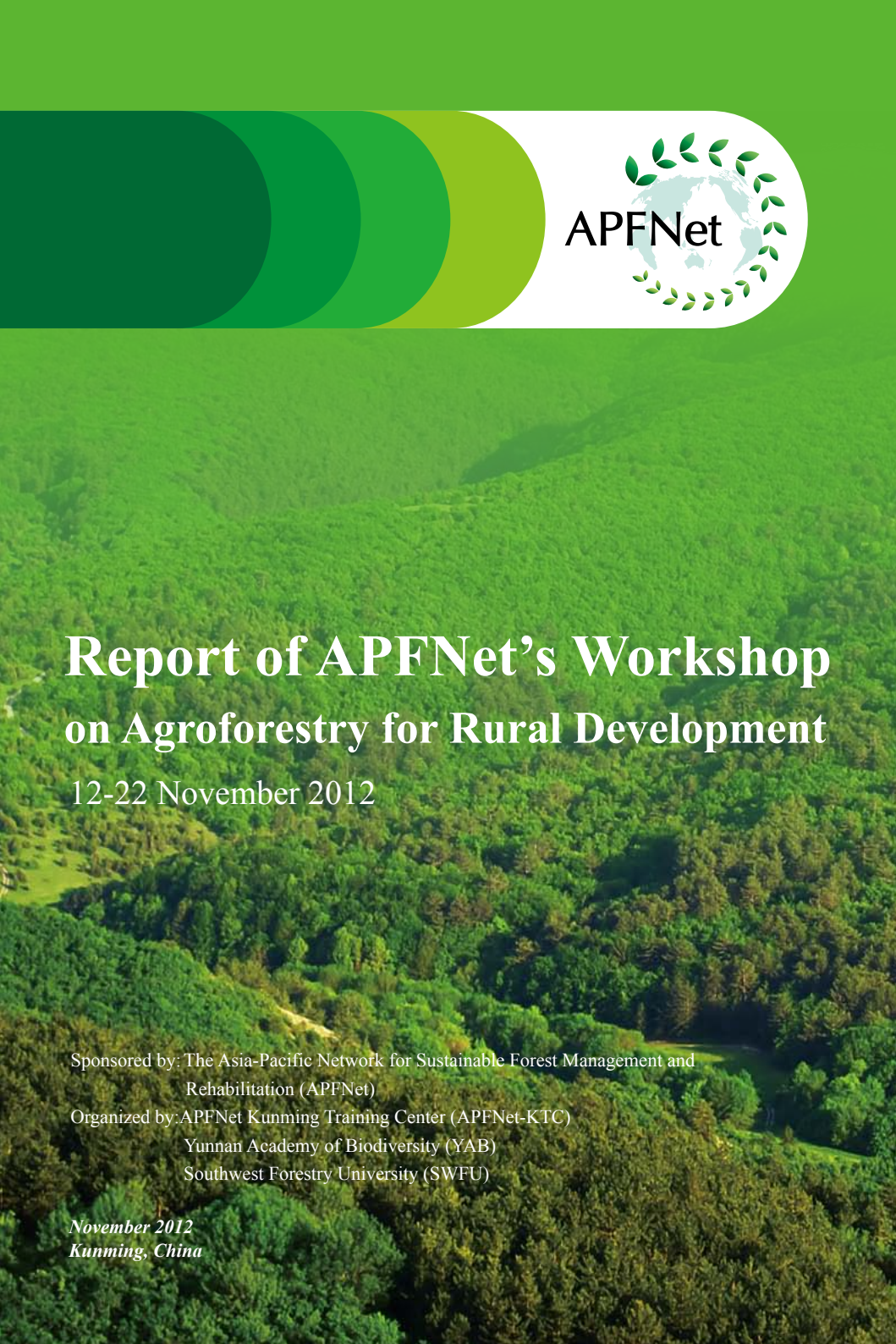


Report of APFNet's Workshop on Agroforestry for Rural Development

12-22 November 2012

Sponsored by: The Asia-Pacific Network for Sustainable Forest Management and Rehabilitation (APFNet)

Organized by: APFNet Kunming Training Center (APFNet-KTC)
Yunnan Academy of Biodiversity (YAB)
Southwest Forestry University (SWFU)

November 2012
Kunming, China

TABLE OF CONTENTS

Acknowledgements

The Asia-Pacific Network for Sustainable Forest Management and Rehabilitation (APFNet), the APFNet Kunming Training Center (APFNet-KTC), the Yunnan Academy of Biodiversity (YAB) and Southwest Forestry University (SWFU) wish to express their heartfelt gratitude to all the people who contributed their time and efforts to make the workshop a success. Special thanks go to Professor Shen Lixin and his team for their dedication and valuable assistance throughout the classroom portion of the workshop and the field trip. We are also grateful to the officials of the county, the forestry bureau and Pu'er City for their support and willingness to share ideas and experiences during the visits onsite.

Last but not least, we would like to convey our sincere appreciation to the participants, whose insights were invaluable in our collective attempts to understand the complexities associated with the role of both traditional and modern agroforestry systems in improving rural livelihoods. With the support of APFNet, we are looking forward to strengthening our collaboration to achieve a better future built on sustainable practices.

APFNet
APFNet-KTC
YAB
SWFU

Preface

The workshop on Agroforestry for Rural Development, as an integral component of APFNet's capacity building program, was held in Kunming City, P. R. China, from 12 to 22 November 2012. Participants consisted of fifteen senior officers from government agencies, research institutes, universities and non-government organizations. The APFNet Kunming Training Center, the Yunnan Academy of Biodiversity and the Southwest Forestry University organized and implemented the session, with guidance and funding from APFNet.

By means of presentations, case studies, field tours and interactive discussion among participants and invited speakers, the workshop provided an overview of agroforestry systems in the Asia-Pacific region and of their importance to rural livelihoods; identified key issues associated with their establishment and maintenance; and suggested ways to address areas of concern. The workshop also served as a forum for decision-makers and other experts to share experiences, practices, knowledge and lessons. Thanks to the concerted efforts of all participants, organizers and collaborators, objectives were met.

This workshop is part of APFNet's efforts to build regional capacity for sustainable forest management over the medium and long terms. The report summarizes the goals, themes, key activities and outputs of the meeting. Recommendations on the design and planning of future training programs are also presented.

November 2012
APFNet

1. Introduction

As a vast natural resource, forests contribute significantly to rural livelihoods and to the communities located within or near them. Among various practices, agroforestry is an important means for rehabilitating degraded ecosystems and for generating alternative sources of income from woodlots, fruit trees, high-value timber trees, medicinal plants and non-timber forest products, for example. Agroforestry also has the potential to reconcile short-term needs with long-term environmental conservation and enhancement.

Under APFNet's capacity building theme "forestry and rural development", outcomes of this workshop will pave the way for future research and case studies. Suggestions from participants and invited speakers on course design, training methods, and outputs are appreciated. APFNet will use this information to improve subsequent training initiatives.

1.1 Objectives

The workshop aimed to exchange the latest knowledge and information on the various aspects of agroforestry: scientific, environmental, economic, social and cultural. It also sought to share good practices and lessons learned over the last decade; identify key challenges associated with achieving sustainable agroforestry as a means to diversify incomes and improve rural livelihoods; and to explore opportunities to develop and implement regional demonstration projects.

1.2 Participants

One participant (6 women and 9 men) from each of 15 developing economies attended the session: Bangladesh, Cambodia, China, Fiji, Indonesia, Lao P.D.R., Malaysia, Mongolia, Myanmar, Nepal, Peru, the Philippines, Papua New Guinea,

Thailand and Viet Nam. They were selected according to APFNet procedures after focal points issued announcements of the event. Most participants were senior officials from forestry agencies, research institutes and universities. One representative was from a regional organization and another was from an international non-government organization (see Annex for details).

Picture 1:One participant from each of 15 developing economies attended the workshop

2. Summary of topics and main activities

2.1 Participant expectations

Following brief introductions, participants were asked to share their expectations of the workshop and what they hoped to learn. The list below summarizes their inputs.

Picture 2-3:Participants were asked to share their expectations of the workshop

Acquire knowledge and share information about agroforestry, including in terms of

>What works well and what doesn't work well

>New technologies

>Current policies and emerging trends

>Marketing aspects

>Benefit-sharing mechanisms

>What economic tree species can be incorporated into agroforestry systems

>Proven practices that can be adapted to the circumstances of each economy

How to increase area under agroforestry as a means to mitigate climate change

Inform participants of the Secretariat of Pacific Community's strategic plan (2013-15)

Strengthen collaboration with APFNet

Develop networks not only for research but also in other areas

Learn about models in China and elsewhere so that experiences, knowledge and Technologies can be applied to improve rural livelihoods, for example by

> Working with local people

> Translating research findings into practices on the ground

Gain insights into how to develop a policy framework to implement agroforestry

Learn about approaches to agroforestry that can drive policy

Get ideas on how to formulate a strategy for the development of agroforestry research

How to solve conflicts between human development and conservation goals

2.2 Overview of topics

In addition to presentations from participants, the workshop covered the following topics: Socio-economic and environmental aspects of agroforestry; the adaptation of traditional agroforestry systems for sustainable land use; the role of agroforestry in the development of community forestry; organic agroforestry for pro-poor development in upland areas; ancient arbor tea plantations and their management; risks, issues, challenges and opportunities associated with agroforestry for rural development.

Report of APFNet's Workshop on Agroforestry for Rural Development

||| Socio-economic and environmental aspects of agroforestry

Dr. Dietrich Schmidt, Professor at the Kunming Office of the World Agroforestry Centre (ICRAF), spoke about how agroforestry, as an age-old land use system, can meet both the economic needs of smallholder farmers and the objectives of environmental conservation. ICRAF defines the term as a collective name for land-use systems and technologies where woody perennials are deliberately integrated with crops and/or animals on the same land management unit. It specifies that the integration can be either in spatial mixture or temporal sequence and that there are normally both ecological and economic interactions between the woody and non-woody components.

Some authors claim that agroforestry systems are the oldest land use systems in history. Examples include shifting cultivation; home and tree gardens; and trees on farms. Modern agroforestry started in Myanmar with the introduction of taungya in the 1870s - a form of modified swidden cultivation to allow for the establishment of teak plantations (seedlings are intercropped with rice for about 3 years, after which time rice is no longer grown). In the 1970s, global concern over deforestation grew and development approaches failed to reduce poverty in rural areas. These issues raised awareness of the importance of forestry for rural development and of the potential for agroforestry to both improve livelihoods and restore the environment. Since 2000, research on agroforestry systems expanded to include not only the interaction among various components but also on broader environmental and livelihood issues such as climate change and poverty alleviation.

In terms of classification, agroforestry systems fall into 3 categories according to structure (nature and arrangement of components); function (the role of components); and location (agro-ecological zones). Ecosystems suitable for

agroforestry practices are created as a result of an accumulation of organic matter. The extent to which they are productive depends on the availability of light (for shoots) and of water and nutrients (for roots).

Productivity also depends on the capability of organisms to convert these 3 elements into organic matter. Agro-ecology aims to make the most efficient allocation of light, water and nutrients to competing plants and it does this through 1) interception - where the time or season is different or, if the same, use of the zone is either horizontal or vertical; and 2) facilitation - where one component changes the environment to affect another component in a positive way. Examples of the ways in which agro-ecology can facilitate growth are through:

>Capture: Water or nutrients intercepted by one component are made available to another.

>Accumulation/storage: Nutrients accumulated during a fallow period are released and made available to another species during a subsequent cropping phase.

>Retention: Resources such as water or nutrients are kept in a system that would otherwise be lost through erosion, leaching or evaporation.

>Concentration: Trees or other means help to concentrate nutrients and water.

>Protection: Shelter from high winds, frost, sunlight and other elements is provided.

Dr. Schmidt then reviewed the environmental aspects of agroforestry with regard to the Influence one component has on the performance of other components or of the system as a whole. From a biological perspective, interactions can be between trees and crops and between trees/animals and trees/crops/animals. In the first instance, trees can negatively affect crops by increasing fungal and bacterial diseases in shaded and more humid environments. Trees also compete for light, water and nutrients. In the second instance, trees can have a positive effect because they provide fodder and shade; animals provide fertilization and control weeds through grazing. However, tree fodder can also be toxic to animals and animals can damage the soil (through compaction) and the woody components.

Agroforestry systems also help to retain soil, particularly in multi-layered systems such as home gardens because ground cover, including herbaceous plants and litter, reduces surface run-off, prevents soil erosion, and diminishes damage caused by wind. They can also have a beneficial effect on biodiversity because they are often part of a complex mosaic of different land uses and, therefore, have the potential to increase biodiversity not only at the farm level but in landscapes as well. However, because these systems are not a substitute for natural ecosystems, their conservation value is limited. For example, they are fragmented; do not provide continuous cover; are often intensively managed; and may not include host plants which are important to maintain certain wildlife species.

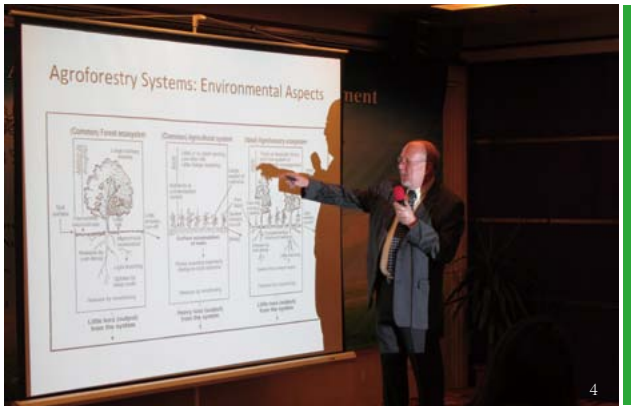
In terms of economic aspects, agroforestry is an appropriate land use system for smallholders who have little capital and low energy requirements, given that its main aim is to meet immediate human needs rather than bring commercial gain. Crop diversity, combined with multi-purpose trees, allow for continuous production and for a variety of goods - a situation which provides a good balance between subsistence and cash income needs. In addition, requirements are low for herbicides, pesticides, energy inputs and site improvement. On the social side, agroforestry can help practitioners to secure tenure; can conserve indigenous agro-ecosystems and knowledge; and can promote participatory approaches.

In conclusion, Dr. Schmidt highlighted that agroforestry systems are capable of providing environmental benefits at the farm level by improving soil quality and micro-climate and in landscapes by increasing their diversity and multi-functionality. Socio-economic benefits include diversification leading to greater resilience; less dependence on external inputs; and less exposure to natural hazards.

||| The adaptation of traditional agroforestry systems for sustainable land use

Dr. Dietrich Schmidt indicated that agroforestry is a form of land use which is probably older than intensive agricultural systems such as paddy farming. He added

that practitioners have shown and are still showing remarkable flexibility in adapting land uses to local conditions and to changing circumstances, including socio-economic and environmental. Swidden cultivation, for example, involves the clearing and burning of natural vegetation to plant crops for a few years, then leaving the land untended while it regenerates. Although this system comes in many forms, fallow is the common element and should not be seen as unproductive land where no planting or sowing is done. In fact, fallows store nutrients in the soil and in the plant biomass; provide raw materials; maintain biodiversity in landscapes; and improve the quality of watersheds. However, when such systems are under pressure, fallow periods are often shortened and this change results in lower yields and in degraded soil and fallow vegetation. In its original form, swidden cultivation was sustainable but, because of population growth and scarcity of land, this is no longer the case. When policies are introduced to suppress it, other land uses such as permanent farming and forestry can replace it. In some instances, fallows and their management actually improve by enhancing their biological efficiency so that production remains stable or increases and by introducing economic species which add value.



Picture 4: An introduction to traditional agroforestry systems for sustainable land use

As Dr. Schmidt noted in his previous lecture, Dietrich Brandis introduced the taungya system in Burma when it was under British colonial rule. The objective was to establish teak plantations, not improve livelihoods. Farmers were encouraged to plant teak seedlings amid their rice paddies and, when rice could no longer be cultivated after 2-3 years, they had to move to other areas. The Forest Service then took over the plantations. Taungya plantations reached their peak in the early 1890s but came to a halt in 1906. They were also established in Laos (1950) under French colonial rule and expanded there, especially after government promoted tree planting on farms in 1985 to improve the livelihoods of swidden cultivators. Incentives included ownership of the land on which teak had been planted after 3 years of management and cash income after trees matured (15-20 years).

Another type of agroforestry system is the home garden which ranges from a kitchen garden to complex multi-storied areas consisting of trees, shrubs, vines, and perennial and annual crops. Related but not synonymous terms are forest gardens, village-forest gardens and tree gardens. In Java, two systems dominate: the pekarangan and the talun/kebun. The first type is a small area (0.1 ha) around the house, fenced and planted with plants ranging from herbaceous vegetable species to trees up to 20 m.

Its main purpose is to produce food for home consumption. Species diversity is high and it has as much as a five-layered canopy - a herbaceous layer near the ground, a tree layer at upper levels, and various intermediate layers. The second type (talun/kebun) consists of a mix of annuals, perennials and tree garden phases where perennials such as bamboo, fast-growing timber trees and fruit trees dominate.

As the name implies, agro-forests are forest-like agroforestry systems which are either cyclic or permanent. They most resemble forests in terms of structure and appearance and farmers establish them by selectively clearing the natural forest and underplanting it with tree and/or food crops. An example of a cyclical system dates back to around 1910 when farmers in Sumatra integrated rubber trees into their swidden fields shortly after they planted rice. They develop along with food crops and forest regrowth and can be tapped after 10 years or so. Once the trees no longer provide sufficient latex, usually after 20-25 years, the plot is clearcut, burnt and replanted to start a new cycle.

An example of a permanent agro-forest is found in West Sumatra where the cultivation of as many as 100 woody and herbaceous plant species have been identified in a single village - timber and fruit trees growing with cinnamon and coffee or rubber, for example. These systems not only contain rich biodiversity but they also offer economic diversity and flexibility. Some components provide products annually (coffee, rubber, fruit trees) while others are harvested whenever the need arises or when prices are high (cinnamon, timber).

An example of a simple permanent agro-forest is a combination of the Himalayan alder (Alnus nepalensis) and the large cardamom (Amomum subulatum) which Nepalese farmers adopted in 1960. The alder is capable of growing spontaneously on disturbed sites and of fixing nitrogen in the soil. It provides firewood to dry the seed capsules of cardamom and its wood is also used for construction, furniture and tools. Cardamom is a perennial shrub that produces an annual harvest of valuable seed capsules which are dried and sold

commercially. Because this cash crop can grow on marginal sites, it does not compete with subsistence crops. In addition, its leaves are used for livestock bedding and compost.

The alternative to planting crops in the forest is to plant trees on farms to provide:

> *Shade to plants and animals*
> *Fodder to animals (and ultimately manure to plants)*
> *Products for home consumption and sale (firewood, food, fiber)*
> *Soil and water conservation*
> *Habitat for useful wild animals (pollinators)*

Since farming in upland areas often depends on organic fertilization, livestock is source of organic manure. In turn, tree leaves provide nourishment to farm animals, especially during the dry season. These linkages become more apparent, considering that an estimated 2.8 ha of forest is required to sustain the productivity of 1 ha of agricultural land. Through the collection of tree leaf fodder, a constant transfer of nutrients from forest to farmland takes place but, if not done in a sustainable way, such lopping significantly degrades forests, as happened in the hills of Nepal.

In areas where the forest cover is heavily degraded, a larger proportion of leaf fodder is obtained from trees on farmland. These trees are either planted or have been retained from the original forest cover. Depending on need, farmers increase the number of

fodder trees on their farms and use them for other purposes, e.g. leaves for green manure and wood for firewood.

In summary, Dr. Schmidt pointed out that farmers have developed a wide range of agroforestry systems over time which they adapted to meet their specific needs in the context of prevailing environmental and socioeconomic conditions. He emphasized that adaptation is a continuous process and that some systems such as swidden need to be modified or replaced to adjust to global change. Lastly, some systems such as the alder-cardamom thrive on change.

||| The role of agroforestry in the development of community forestry

Dr. Schmidt stated that agroforestry is often promoted, in parallel with community forestry, as a sustainable land use system and as an alternative to conventional and centralized forest management. In fact, the two approaches are complementary and can provide the synergies required for rural development in the Asia-Pacific region. He added that both concepts have a long history of indigenous applications and attempts to institutionalize them began in the 1870s when Dietrich Brandis introduced taungya in Burma and tried to create a legal basis for community forestry in the Indian Forest Act of 1878 when he was head of the British Indian Forest Service from 1864 to 1883. Although his ideas were incorporated into this piece of legislation, they were never implemented. As early as 1868, he advocated the establishment of village forests - tracts of communal land set aside for reforestation - as a means to halt deforestation.

Report of APFNet's Workshop on Agroforestry for Rural Development

Benefits were to be shared among residents and the forests were to be managed by local personnel under the supervision of government. Brandis also suggested that forest plantations be established solely for agricultural purposes such as to provide leaf fodder.

Like agroforestry, community based natural resources management (CBNRM) is not a new concept. Many well known examples of age-old systems can be found in Asia such as village irrigation in Bali and community forestry by the Sherpa in Nepal. However, in the 19th and 20th centuries, both colonial and central governments called for control over natural resources to be centralized. These policies resulted in the creation of state forest departments and in laws that gave them exclusive management rights. As a result, communities lost control and, because the state was not able to effectively carry out its mandate, resource degradation worsened. In the 1970s, failed development strategies and continuing threats to the environment prompted a rethinking of such policies. With the publication of a paper in 1978, entitled "Forestry for local community development", the Food and Agriculture Organization of the United Nations started the process of establishing community forestry in developing economies.

Implementation was based on the assumptions that communities were viable entities that had structures and procedures in place for collaborative management. It was also recognized that they were better suited than the state in this regard because of their dependence on these resources, their proximity to them and their competence in terms of indigenous knowledge. This collective approach was expected to achieve sustainable use, regenerate degraded resources, improve the livelihoods of poor people, strengthen community cohesiveness and integrity, and enhance collaboration between villages and government agencies.

Community forestry was introduced in India and Nepal in the 1970s and gradually spread to Southeast Asia. Events in Nepal are particularly instructive in that, during implementation, it was revealed that community-based forest management systems already existed and that such forests were categorized in the Forest Act of 1961. The Domestic Forestry Plan (1976) recognizes the role of local people in managing forests for their own benefit and responsibility was assigned to communities (panchayats) in 1978. Ten years later, Nepal's Master Plan for the Forestry Sector called for forests to be handed over to self-organized community forest user groups - a provision that was codified in the Forest Act of 1993 and the Forest Regulation of 1995.

Although few comprehensive studies have explored the impact of community forestry on forest conservation, anecdotal evidence suggests that the approach often improves forest conditions. However, it is also said that benefits accruing to local people have been limited and that decision-making over forest management has not fully devolved. In summary, even though community forestry is more of a policy framework and agroforestry is more of a land use practice, one can serve the other. For example, villages can use community forestry to obtain control over land to practice agroforestry and implementations of agroforestry systems can then help to achieve the objectives of community forestry.

APFNet's capacity-building program

Ms. Wang Qian, Program Officer in the APFNet Secretariat, provided participants with an overview of APFNet capacity-building program. She explained that the main components consist of training workshops, APFNet scholarship program and the Forestry College Deans Meeting Mechanism. The workshops are designed along two themes since 2009:

(1) forestry and rural development and

(2) sustainable forest resource management.

They are found to be an effective platform for sharing knowledge, experiences and lessons learned. They also generate new ideas and concrete steps to reduce poverty and maximize socio-economic benefits derived from sound forest management. She indicated that, since the scholarship program began in 2010, 24 students from 11 Asia-Pacific economies have been enrolled in postgraduate studies in forestry: Bangladesh (3), Cambodia (3), Indonesia (1), Lao PDR (4), Malaysia (3), Mongolia (1), Myanmar (2), Nepal (2), Papua New Guinea (1), Thailand (3) and Viet Nam (1).

In response to the many challenges facing forestry education in the region, including outdated curricula, weak international linkages and weak collaboration with industry, deans of forestry universities a nd colleges met in May 2010 to explore possible solutions. In November of the following year, the College Deans Meeting Mechanism was formally launched and is housed in the Beijing Forestry University (BFU). A steering committee of 9 universities from the region serves as its decision-making body. It is co chaired by Professor Luo Youqing (BFU) and Professor John Innes (University of British Columbia).

Ms. Wang Qian concluded her presentation by highlighting changes made to APFNet's website and she encouraged participants to refer to it often to receive the latest news and updates.

||| Organic agroforestry for pro-poor development in upland areas

Ms. Yan Mei, Project Manager at the World Agroforestry Centre's office in China, spoke about how organic agroforestry can play a significant role in improving the livelihoods of poor people in upland areas. She explained that, in many tropical economies, the cycle of biophysical and socioeconomic processes on agricultural land can cause ecosystems to degrade, their functions to breakdown and biodiversity to be lost.

In remote mountain areas which often lack business opportunities, the economy of households is based on products derived from natural and planted forests. This dependence sometimes leads to the intensive collection of non-timber forest products (NTFP) and to their severe decline. However, most small-scale farmers earn little income from this source because of transportation difficulties, lack of local processing facilities and the absence of market information.

The push toward organic certification comes from companies that want to be seen as responsible environmental stewards, not from farmers. Popular crops such as walnuts are ideal candidates for these schemes because markets are large and well established. Medicinal plants, mushrooms and other nuts are also suitable because they can be dried and further processed to preserve them during transportation. The International Federation of Organic Agriculture Movements reports that revenue from global sales of organic food and drink reached 54.9 billion US dollars in 2009 - a three-fold increase over 2000 levels (IFOAM, 2011). It also found that the European Union and the United States of America have the biggest market share at 51% and 45% respectively. Japan makes up almost all of the Asian market (2%). Between 2000 and 2006, China moved from 45th to 2nd place in terms of the number of hectares worldwide under organic management (11% of the total) but most of the organic food grown and processed here is exported. However, some maintain that the domestic market is increasing by as much as 30% per annum.

Ms. Yan Mei then reviewed the principles on which organic farming is based.

> *Health: It should sustain and enhance the health of the soil, plants, animals and people as one and invisible.*

> *Ecology: It should be based on living ecological systems and cycles, work with*

them, emulate them and sustain them.

> Fairness: It should build on relationships that ensure fairness with regard to the common environment and available opportunities.

> Care: It should be managed in a precautionary and responsible manner to protect the health and well being of current and future generations and the environment.

As noted earlier, trading companies, not farmers, are the driving force behind the growth in organic production. They target high value "niche" markets and organic products help them gain a good image among customers. Producers tend to contract smallholders because management costs are less than training and monitoring. Given the difficulty in regulating and monitoring a large number of individual operators, all production, processing and handling of products are registered under one certification scheme which covers the group. No one is allowed to use the logo independently.

In a final comment, Ms. Yan Mei noted that a farmer's willingness to seek certification depends on whether he has secure tenure because the accreditation process takes 3 years and even longer to determine whether returns on investment are worth the expense.

||| Ancient arbor tea plantations and their management

Dr. Michelle Wong, a post-doctoral fellow at the Institute of Geographic Sciences and Natural Resources Research of the Chinese Academy of Sciences, provided an overview of ancient arbor tea plantations and their management. She introduced the topic by noting that Yunnan is a major production area for tea and the source of the genus Camellia.Some wild tea trees exceed 1000 years and are 20 meters high. After more than 2000 years of domestication, cultivation, production and consumption, tea is strongly tied to the livelihood and traditions of the Bulang, Wa, Hani, Dai and Deang people. For centuries, products were a tribute to emperors and were exported to other economies such as Myanmar and Thailand.

When tea trees are planted under the natural forest canopy, the products are grown in harmony with nature, free from artificial pesticides and fertilizer, and command higher prices because of their scarcity, unique taste and aroma. However, terrace tea plantations were introduced in the 1980s because they are easier to manage and yield is higher. Conversion of ancient tea plantations, coupled with their mismanagement, led to a 60% reduction over a 50-year period but efforts are now underway to restore and protect these areas due to expanding markets for high quality organic products.

In terms of ecology, the canopy of ancient tea plantations is less dense than natural forests, a situation which allows herbaceous plants to flourish on the ground. In addition to high soil fertility, these areas are rich in natural biodiversity, including protected plant species, and they are free from pollution. They are also a source of food, medicine and fiber and resist natural disasters as well as insect outbreaks. In terms of management, seedlings which regenerate naturally are planted 2 m apart under the forest canopy and undesirable trees and shrubs are removed to control density. Harvest takes place in the spring and autumn, with simple maintenance in the other 2 seasons. Individual households own the plantations but cooperatives are sometimes formed to run business aspects.

Most of the ancient tea plantations in Yunnan are grown in the mountains of Mangjing Village (1868 ha which produce 275 tons per year) and this traditional way of life has preserved the culture and beliefs of its ethnic population. Products make up close to 75% of annual incomes - about 3200 yuan/person. In recent years, the price of the fresh leaves of ancient tea ranges between 40 and 70 yuan, while that of terrace tea is between 10 and 20 yuan. Although yield is 6 times higher in terrace plantations, ancient tea commands 4 times the price and has more potential for market growth and eco-tourism.

Recent measures have been taken to protect ancient tea plantations and to promote products through better branding. In 2007, the farmers of Mangjing Village signed protocols which outlined specific management and business practices. In 2008,

regulations were passed to control the quantity of harvest and subsidies were made available for restoration activities. In 2012, the Food and Agriculture Organization of the United Nations declared ancient tea plantations as globally important agricultural heritage systems. Despite such progress, ancient tea plantations are still mismanaged and over-harvested due to poverty and lack of awareness. Fierce competition, low technology, weak branding and fluctuations in the quality/quantity of supplies are making producers feel insecure. Many native species have disappeared and invasive species are being introduced. Adverse climate and an increase in the number and severity of natural disasters are also problematic.

To address these issues, Dr. Wong suggested the following action:

> *Make markets more transparent*
> *Facilitate information exchange*
> *Train farmers in production technology, financial management, sales and marketing*
> *Strengthen cooperatives*
> *Increase supervision*
> *Diversify income sources: plant other tree species and engage in eco-tourism*

2.3 Group work

One working group session was convened during the workshop to discuss the key issues and challenges associated with making more effective use of agroforestry for rural development. Outcomes of these deliberations are summarized below.

Picture 5-8: Group work to discussmore effective use of agroforestry for rural development

||| lssues and Challenges

No specific policy framework for agroforestry
Climate change, including increase in invasive species, pests and diseases
Weak domestic collaboration among sectors and at the international level
Lack of funding and investment capital
Limited access to markets, market information and marketing strategies
Unstable/fluctuating markets and price fixing by wholesalers
> No single agency to coordinate marketing aspects
Absence of feasibility studies for enterprise development
Insecure land tenure
> Shortage of arable land
Insufficient technical and technological support, including science-based

> Low capacity for processing to add value and for training trainers
> Lack of community involvement
> Lack of information and awareness
> Political instability
> Not enough pilot plots or research, including on matching species to sites

||| Possible solutions

Reach a common understanding of agroforestry among Asia-Pacific economies
Enhance networking and collaboration at local, domestic and regional levels
Control soil erosion and increase forest cover
Strive to achieve certification to gain a higher share of the market
Add value to products through processing
Strengthen education and capacity building
Improve institutional and policy frameworks
Maximize development activities in terms of benefits over time
Invest in more research, including on the adaptation of species to climate change
Establish an agency that coordinates all aspects of marketing
Involve local people in decision-making to a greater extent
Engage in more effective transfer of knowledge and technology
Develop an interactive website to share knowledge and lessons learned

2.4 Communication among participants

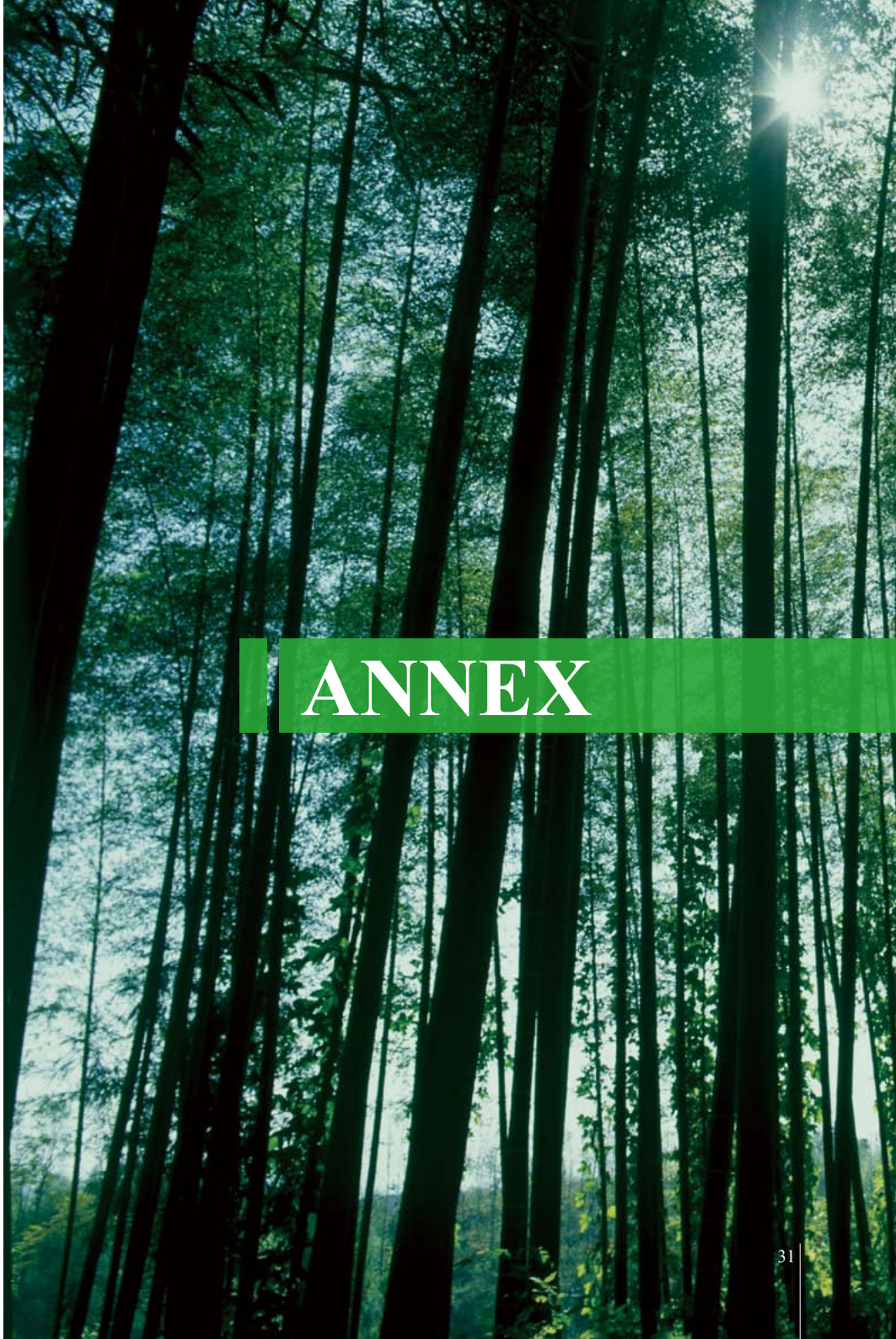
During the workshop, participants described domestic efforts to use agroforestry as a means to develop rural areas and improve livelihoods. This exchange of information highlighted the need for stronger collaboration among sectors and the difficulties associated with reducing poverty in remote communities. On the positive side, the many types of agroforestry systems, when practiced sustainably, brought significant benefits in both ecological and socio-economic terms.

3. Evaluation

A questionnaire was distributed at the end of the workshop to assess the level of communication and understanding among participants and to obtain their feedback and suggestions on the organization and design of topics, communications, the preparation of materials, arrangements for the field trip, accommodations, and secretariat services.

Findings showed that participants were satisfied with the course design, materials and logistics. All indicated they learned a great deal from each other, from the resource people and from the secretariat staff. They also expressed an interest in receiving regular updates from APFNet. The main suggestions they made to improve future workshops on agroforestry are listed below:

Arrange more visits to agroforestry sites and make the field trip longer
Provide documentation on best practices in China and in other economies
Invite resource persons from NGOs/institutions to present successful models
Provide more information on relevant new or advanced technologies
Plan more group discussions
Allocate more time for participant presentations
Involve local farmers during on-site visits
Ensure site visits are related to the objectives of the workshop
Establish a network/interactive website for communications among participants
Organize workshops in other economies, based on expertise/interest in the topic
Conduct follow-up through APFNet focal points and organize a domestic workshop



ANNEX

ANNEX: LIST OF PARTICIPANTS

1. **Mr. Mohammad Shah-E-Alam**
Deputy Conservator of Forests
Ministry of Environment and Forests
Bangladesh
Email: cfdnkl@gmail.com

2. **Mr. Ma Vuthy**
Deputy Chief, Forestry Administration
Ministry of Agriculture, Forestry and Fisheries, Cambodia
Email: vuthydalin@yahoo.com

3. **Mr. Vinesh Prasad**
Agroforestry and Communications Technician, Secretariat of the Pacific Community, Fiji
Email: Vineshp@spc.int or vinesh001@gmail.com

4. **Ms. Leti Sundawati**
Senior Lecturer, Department of Forest Management, Faculty of Forestry, Bogor Agricultural University, Indonesia
Email: lsundawati@gmail.com or leti_sund@yahoo.com

5. **Mr. Phomma Pathoummavong**
Head, Forest Certification Unit
Department of Forestry, Lao P.D.R.
Email: p.pathoummavong@yahoo.com

6. **Mr. Yusuf bin Yahaya**
Sr. Assistant Director of Forestry
Forestry Departmen, Peninsualr Malaysia
Email: yusuf@forestry.gov.my

7. **Mr. Baatarbileg Nachin**
Professor, Department of Forest Sciences
National University of Mongolia
Email: baatarbileg@num.edu.mn

8. **Mr. Moe NaingOo**
Project Officer
The Lutheran World Federation, Myanmar
Email: moenaing111@gmail.com

9. **Mr.Bodh Raj Subedi**
Under-secretary, Kapilvastu District, Department of Forests, Nepal
Email: bodhsubedi@gmail.com

10. **Ms. Carolina Liz Vidal Veliz**
Engineer Specialist in Forestry, General Direction of Forestry and Wildlife, Peru
Email: cvidal@minag.gob.pe

11. **Ms. Julie Tanguilig**
Forest Management Specialist, Department of Environment and Natural Resources, Foret Management Bureau, the Philippines
Email: jntnaguilig@yahoo.com

12. **Ms. June Mandawali**
Silviculture Officer
PNG Forest Research Institute
Email: jmandawali@fri.pngfa.gov.pg

13. **Mr. SomdetChampee**
Technical Forestry Officer
Royal Forest Department, Thailand
Email: champee25@yahoo.com

14. **Ms. Nguyen ThiThuy**
Researcher
Silviculture Technique Research Division
Vietnamese Academy of Forest Science
Email: nguyenthuyfuv@gmail.com

15. **Ms. Li Jianqin**
Associate Professor
Southwest Forestry University China
Email: jqltc@yahoo.com.cn

Report of APFNet's Workshop on Agroforestry for Rural Development

Asia - Pacific Network for Sustainable Forest Management and Rehabilitation

Tel: +86-10-8421 8108
Fax: +86-10-8421 6958
Website: http://www.apfnet.cn
E-mail: info@apfnet.cn

Add: 6th floor, Baoneng Center, 12 Futong Dongdajie, Chaoyang District, Beijing, 100102, P,R, China