

Report of Workshop
“Forest Restoration at Landscape Level in Asia-Pacific Region”
25th APFC Session Parallel Meeting,
3 November 2013, Rotorua, New Zealand

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Summary of conclusions

The concluding session, examining the issues for a way forward, addressed the following questions:

- What types of collaboration and what sorts of mechanisms are needed to bring about effective Forest Landscape Restoration (FLR) planning and implementation?
- Are there practical ideas and an appetite for collaboration?
- How can FLR investments be secured in a competitive environment?
- Do target audiences and the general public know enough about FLR to enable the concept to grow into a social movement?
- Do we have a sufficient understanding of the role of markets in FLR?
- Are land managers sufficiently represented in policy decisions at multiple levels of policy development?

The participants contributed a list of options for collaboration that included outreach programmes, networking, advisory mechanisms, and submissions for policy development. They reflected on the current status of FLR and requirements for success. Participants were unanimous in agreement on the crucial importance of tenure security as a foundation for successful FLR. There was also common agreement on the need for: strategic spatial planning and multi-stakeholder consultation, multi-functional forestry silviculture, conflict management, and market analysis and development. FLR theory of change and use of technical tools to distinguish this approach from others was further emphasised. Pooling experiences and insights, the participants discussed what people are doing, and why in the context of FLR, it is essential to improve livelihoods and biodiversity. They identified key actors, and suggested opportunities for sharing knowledge, including the creation of new communication platforms and materials, along with options for enlisting media support to increase awareness of FLR among decision-makers, political leaders and the general public.

Introduction

While we have converted millions of hectares of forests mainly for food production, we should not ignore the fact that we still have hundreds of millions of people still dependent on forests for a variety of needs, ranging from food, energy, shelter, medicine, building material etc. The tropical forests are also the home for much of the terrestrial global biodiversity. In recent times, the significance role of forests in climate change is beginning to grab global attention. Despite all these values, currently we still keep losing some 14 million hectares of forests annually. This aside, large areas of the remaining forests have become severely degraded, and are not in a condition to provide the full set of services and products normally attributable to them. The rate of forest loss in the Asia-Pacific region, however, has declined in the last two decades, mainly as a result of extensive afforestation in China. This however, masks the fact that some of the biodiversity rich forests of Southeast Asia are still being lost.

The successes achieved by Northeast Asian countries have kindled strong interest in forest restoration. But questions have been raised about their costs, will they last, and be ecologically and socially beneficial? These questions led to interest into forest landscape restoration (FLR), which represents an approach to balance both the conservation and production issues, undertaken in consultation with the stakeholders. This landscape level approach took root in the late-1990s, and several agencies, including FAO have begun to support the initiative. Since then, there have been international calls such as the Bonn Challenge to restore 150 million hectares of forests globally by 2020. However, the knowledge on FLR is limited in the Asia-Pacific region, and is unlikely to have a major impact on restoration work in the region. With this in view, FAO and RECOFTC initiated a multi-country study to review the status of forest rehabilitation in the region, and to explore the scope for implementing FLR approaches.

As part of the initiative, a regional expert group meeting (workshop) was organized in conjunction with the Asia-Pacific Forestry Commission (APFC) Session in Rotorua, New Zealand. The participants included the authors of the country studies, selected international experts, and forestry officers from the region. The main objective of the workshop was to facilitate a partnership among institutions in the Asia-Pacific region for promoting a better understanding of the FLR principles and to guide implementation of related activities in the region. The specific objectives were to provide a forum for familiarizing with the concept of FLR, review the country case studies, facilitate partnership among institutions dealing with FLR, and develop practical recommendations for their cooperation. This report is a summary of the expert group workshop.

Forest Restoration at Landscape Level in Asia-Pacific

Summary of the Pre-session workshop

At a workshop conducted immediately prior to the Twenty-fifth Session of the Asia-Pacific Forestry Commission (APFC) in Rotorua, New Zealand, 21 participants convened on 03 November 2013 to discuss the current shift towards managing forests for multiple values and ecosystem services. Central to this shift is the focus on forest restoration at the landscape level (FLR). This focus emphasizes the need to move aggressively beyond the limited view of reforestation for timber production as the principal outcome. In this context, workshop presentations and discussions dealt with initiatives aimed at addressing rural poverty, increasing biodiversity, ensuring stable supplies of water, and providing other environmental services. Additionally, the participants noted the relevance of sustainable forest management (SFM) and FLR to climate change and carbon sequestration.

Following introductory remarks by Dr. Simmathiri Appanah¹, three senior resource persons offered presentations highlighting key aspects of FLR planning and implementation, along with experiences gained, lessons learned, options for moving forward, and issues to consider.²

In the first presentation: “*A review of forest rehabilitation in the Asia-Pacific region – lessons from the past*”, Dr. Unna Chockkalingam,³ summarized policies that have led to negative impacts on forests and forest-based communities, biodiversity and the environment in general. Citing (among others) examples from teak plantation development in Myanmar, and tree-planting directives in Vietnam, Dr. Chockkalingam identified factors that should be considered now and in the future, in order to avoid problems, conflicts and repetition of past failures.

Dr. David Lamb⁴ offered the second presentation: *Shifting from forest rehabilitation to forest and landscape level restoration: why, how and what?*” Underscoring the needs and opportunities inherent in an FLR-oriented strategy, Dr. Lamb highlighted the results of analysis and research that looked into the potentially-positive outputs of changes in restoration approaches. He also explained how certain factors could either contribute to the attainment of restoration objectives or (on the other hand) make it more difficult for those objectives to be achieved. In respect of environmental services (ES) that can be produced through efficient forest management, Dr. Lamb pointed out the importance of “scale” in thinking, planning and implementation, noting that isolated patches of forest would not adequately provide the ES services envisioned in a carefully-designed FLR approach.

In the third presentation: *Forest and Landscape Level Restoration: We need more than techniques*”, Dr. Don Gilmour⁵ recounted how community forestry in Nepal evolved, over almost two decades, from a project-level set of activities into a national movement. Significant gains have resulted from this condition, in terms of expanded forest cover, reduction in soil erosion and alleviation of rural poverty.

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² Copies of the power point presentations and accompanying texts may be requested from Dr. Appanah, simmathiri.appanah@fao.org

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⁴ Dr. David Lamb, University of Queensland School of Agriculture and Food Science d.lamb@uq.edu.au

⁵ Dr. Donald Gilmour, Honorary Fellow, RECOFTC, don.gil@bigpond.com

Dr. Gilmour pointed out however that, as in many other areas of human endeavour, success can breed envy and problems. For instance, forestry department officers are currently seeking a change in policies that would require Nepalese farmers to surrender to the government a major portion of income earned from timber harvested on forests they restored over many years. Dr. Gilmour also described two contrasting situations in Indonesia. Whereas tree-planting is an integral part of traditional farming systems in West Java, the opposite case prevails in part of Northern Sumatra where insecure tenure on some clan-owned lands is complex, unclear and contested.

Open forum type discussions were conducted following the presentations. These discussions were stimulated by the following questions posed by Dr. Andrew Ingles⁶.

- What types of collaboration and what sorts of mechanisms are needed to bring about effective FLR planning and implementation?
- Are there practical ideas and an appetite for collaboration?
- How can FLR investments be secured in a noisy, competitive environment?
- Do target audiences and the general public know enough about FLR to enable the concept to grow into a social movement?
- Do we have a sufficient understanding of the role of markets in FLR?
- Are land managers sufficiently represented in policy decisions at multiple levels of policy development?

Participants contributed enthusiastically to the discussions and developed a list of options for collaboration. They reflected on the current status of FLR and requirements for success. Participants were unanimous in agreement on the crucial importance of tenure security as a foundation for successful FLR. There was also common agreement on the need for strategic spatial planning and multi-stakeholder consultation. Pooling experiences and insights, the participants discussed what people are doing and why in the context of FLR to improve livelihoods and bio diversity. They identified key actors, and suggested opportunities for sharing knowledge, including the creation of new communication platforms and materials, along with options for enlisting media support to increase awareness of FLR among decision-makers, political leaders and the general public.

Country-specific presentations (summarized below) provided a broad range of examples and lessons learned that have potential impacts on moving forward toward enhanced FLR application.

CHINA: In their presentation; “*Theory and Practice of Forest restoration at landscape level in PR. of China*” Messrs. Yuanchang LU, Xianzhao LIU, Daosiong CAI⁷ summarized the events, projects and studies that culminated in adoption of a Multiple Forest Function Movement (MFFM) that typifies an FLR approach. They made special mention of: (i) an

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⁷ Institute of Forest Resource Information Techniques(IFRIT)
Chinese Academy of Forestry (CAF)

Experimental Tropical Forest (ECTF) initiative, (ii) large scale restoration of ice-damaged forests in Hunan Province, and (iii) 15 demonstration MFFM pilot units.

Among others, the China presenters traced the evolution of policies that contributed to adoption of the MFFM. They equated MFFM with FLR which they defined as “a planned process to regain ecological integrity and enhance human well-being in deforested or degraded landscapes”.

They furthermore took note of collaboration in development of the FLR concept with major international conservation organizations including the International Union for Conservation of Nature (IUCN), the World Wide Fund for Nature (WWF) and the International Tropical Timber Organization (ITTO).

The presenters made special mention of: (1) Spatial Planning Techniques (SPT), and (2) Close-to-natural Forest Management (CNFM) in China’s approach to FLR.

THAILAND: Dr. Prasit Wangpakapattanawong⁸ described application of the “*Framework species method for tropical forest restoration*” adapted from Queensland, Australia and implemented at Doi Mai Salong village, Chiang Rai, Thailand by the Forest Restoration Research Unit (FORRU) of the University of Chiang Mai

Dr. Wang explained that planting of native species to rapidly restore forest cover is central to implementation of the method. Seedlings are propagated in nurseries for one year, then planted out and carefully maintained. Species are chosen for their ability to: (i) grow fast, (ii) suppress weeds, (iii) be resilient to fire, and (iv) provide nectar and fruit for wildlife at an early age. Normally, from 20-30 framework species are planted at close density (about 3,125 seedlings per hectare).

Encouraging results have been obtained. For example, in addition to successful establishment of the planted seedlings, 72 new species have emerged via natural regeneration after 8-9 years. Additionally, while some 30 bird species were identified before restoration, 87 bird species have been recorded 6 years after restoration.

FORRU notes that despite relatively high costs, the method is justified by its positive impact on biodiversity and its replicability. Restoration manuals for using the method have been published in English and translated into Chinese, Cambodian, Indonesian, Khmer, and Vietnamese languages.

PHILIPPINES: Although unable to attend the AFPC event, Dr. Ernesto Guiang and Mr. Rodolfo Aragon⁹ agreed to have their paper *Forest Restoration at Landscape Level in the Philippines* presented on their behalf.

They pointed out that in 1900, Philippines forests were estimated to cover about 70% of the country’s total land area of around 30 million hectares. But by 1999 only 18.3% of the original forests remained.¹⁰

Efforts to halt the depletion included reforestation, agroforestry, and assisted natural regeneration (ANR). These various initiatives have resulted in an eleven percent (11%) increase in forest cover from the former 6.5 million hectares to about 7.2 million hectares at

⁸ Forest Restoration Research Unit (FORRU) University of Chiang Mai

⁹ Private sector consultants

¹⁰ Report of the Environmental Science for Social Change (ESSC) institute. 1999.

present. Guiang and Aragon presented a list of key policy incentives that helped produce positive impacts. They also explained the various technical measures that were applied.

Principal focus of the presentation relevant to FLR was the implementation of Forest Land Use Planning (FLUP) in collaboration with the City Government of Bayawan in Negros Oriental Province, and supported by the USAID.¹¹ They recounted how technical assistance was provided on evaluating all lands within Bayawan's jurisdiction, noting current land use, and formulating plans for improving land use including restoration of forest cover.

The FLUP process took many months to complete. But by incorporating both socio-economic and environmental concerns, the results envisioned in FLR were achieved, including stabilization of 170 km of river bank, establishment of wildlife corridors, and effective implementation of a watershed management project that has helped ensure a stable supply of potable water to Bayawan city.

Experience summarized in the presentation highlights the importance of close interaction and collaboration with local government authorities, in addition to the concerned national government agencies. Also noted is the need for technical assistance to introduce and help carry out the FLUP process

INDONESIA: The presentation "*Forest Management Unit (FMU): As an approach in Forest Landscape Restoration*" was authored by Messrs. Ani Adiwinata Nawir¹², Julmansyah¹³, M. Ridha Hakim¹⁴, and Petrus Gunarso¹⁵.

They described experience within 32,776 hectares of Sumabawa Province that validated application of the FMU approach as a landscape-platform for:

- Conservation, rehabilitation, economic and sociocultural activities, implemented concurrent with measures addressing ecological problems, along with socioeconomic and tenurial conflicts under an integrated management, and
- Interaction between key stakeholders, including local communities, to collaborate in complementarily managing the resources and resolving conflicts.

The venue for experiences cited in the presentation is the ongoing ACIAR-assisted Kanoppi Project¹⁶ that integrates timber and non-timber production (NFTP) and marketing, facilitated by a favourable policy and regulation framework.

In pursuit of improved local livelihoods, the FMU approach seeks to identify and implement enhanced strategies and value chains to improve timber and NFTP market links for smallholders. Concurrently, the project continues analysis and improvement of policy frameworks, and aims at expansion of smallholder-managed integrated timber and NFTP production systems through extension programmes.

The Kanoppi Project is complemented by establishment of a Permanent Sampling Plot (PSP) for Carbon initiative, in a protected forest dominated by *tengkawang* (*Dipterocarpus retusus*). The site is part of an integrated watershed management initiative jointly carried out by the FMU staff and the local community. Forest-honey marketing and improving the management of NTFPs are additional project components.

¹¹ United States Agency for International Development

¹² CIFOR

¹³ FMU Sumbawa Province

¹⁴ World Wildlife (WWF) Indonesia

¹⁵ Tropenbos Indonesia

¹⁶ ACIAR Project, FST/2012/039, April 2013 – Dec 2016

The presenters stressed that both timber and NTFPs are important sources of income in Central Java. These sources include teak (*Tectona grandis*) plantations on privately-owned lands that provide raw material for cottage-based wood industries such as furniture and woodcarving. Other important products are cashew nuts (*Anacardium occidentale*), *Gnetum gnemon*, bamboo, jack fruit, etc.

There are currently FMU pilots at 36 sites but further expansion is being hindered by: (i) tenurial conflicts resulting from delineation of production forest and community farming area, and (ii) rapid increases of non-sustainable land use affecting the carrying capacity of the watersheds.

VIETNAM: Offering his country's approach to FLR, Dr. Phan Minh Sang, Vice Director, Silviculture Research Institute, Vietnamese Academy of Forest Sciences, presented the APFNet¹⁷ project case "*Natural forest restoration in Vietnam*".

The project is pursuant to an Agreement between APFNet and the Ministry of Agriculture and Rural Development, signed July 2010 with a duration of 2.5 years. Implementation was carried out by the Phu Tho Sub-department of Forestry in partnership with the Vietnamese Academy of Forest Sciences (Silviculture Research Institute).

Activities were implemented in a severely degraded forest landscape characterized as degraded secondary forests, located in an area populated by poor Dao and Muong ethnic communities who depend on forest resources for subsistence. Project interventions included: (i) application of best forest restoration practices, (ii) community development, (iii) forest enrichment planting with native tree species, (iv) growing NTFP species under the forest canopy, and (v) participatory approaches for community forestry management. All interventions were designed to be as simple as possible

Results thus far include: (i) 50 hectares of degraded natural forest restored by enrichment planting with the composition of valuable tree species increased by more than 100 %, (ii) 50 hectares of forest enriched by native NTFPs growing well under the tree canopy, (iii) improvement of local livelihoods through project employment and NTFP collection (iv) development of a micro institutional framework comprising village rules and a community-based forest management Board of Directors, and (v) contributions to the formulation of provincial forestry technical policies.

The presenters reported that the model design followed is simple, practical for local communities to apply, and easy to replicate. They emphasized that the project is one of the first in their country wherein local forestry staff and communities directly applied "best practices" in natural forest restoration. This collaboration strengthened local capacity (forestry authorities, ethnic communities) through training courses, study tours and especially, "hands-on" project implementation.

Furthermore, the project enhanced connections between Research and Development. It directly applied the results of research conducted by the Vietnamese Academy of Forest Sciences.

MYANMAR: Dr. Ba Kaung's presentation "*Rehabilitation of Shin-ma-taung hill in central dry zone of Myanmar*" describes activities and results over an 18-year time span in an area characterized by semi-desert conditions.

¹⁷ Asia Pacific Forestry Network

The site (Shin-ma-taung Hill) is located within Yesagyo Township, Pakokku District, Magway Region, in the Central Dry Zone of Myanmar. It comprises an isolated peak reaching 525 meters above sea level, and surrounded by flat land. The total area is around 7,700 hectares comprising 7,300 hectares of reserved forests and 400 hectares of un-classed forests. Average annual rainfall is a meagre 450 mm. Temperatures can rise to 45°C from March to May and drop to 12°C in December and January. Soil is composed principally of sand, gravel and rocks. The vegetation is typical of Dry-thorn forests, dominated by *Acacia*, *Zizyphus* and neem species. One of the most famous species from this region is *Limonia acidissima*, locally called Thanatkha, from which a sap is derived that Myanmar ladies traditionally use as facial and body cream

Although well-forested until the 1960s, severe depletion began in the 1970s. After 30 years of cutting to produce logs, poles and firewood, accompanied by slash-and-burn farming, fodder gathering and pasturing, the once green hill was transformed into a degraded landscape. Local streams and ponds dried up and wild animals disappeared. Given the harsh climatic and edaphic conditions, natural regeneration and recovery of forest cover virtually ceased

Rehabilitation commenced in 1995, implemented by the Forest Department (FD) and the Dry Zone Greening Department (DZGD). Principal strategies employed were plantation establishment and protection of any remaining natural vegetation. From 1995 to 2001, some 2,163 hectares of forest plantation were established, along with 807 hectares of village fuel-wood plantations, a 31 hectares Community forest plantation, and watershed hill greening covering 1,325 hectares. Planting prioritized indigenous drought resistant species such as *Acacia catechu*, *Acacia leucophloes*, *Azadirachta indica*, *Tamarindus indica*, and *Zizyphus mauritiana*. Protection of the remaining natural vegetation focused on surviving mother trees and stumps. From 1998 to 2003 a total 4,926 hectares of degraded forest areas have been kept under continuous care and protection, including the clearing of inspection paths, installation of warning signboards, assignment of forest guards, and regular patrols to protect against fire, grazing, illegal cutting, encroachment, and other disturbances

Results after 18 years include rehabilitation of 7,089 hectares consisting of restoration via natural regeneration and plantation establishment. Ninety-two percent (92%) of the area has been rehabilitated (revegetated), soil and water quality has improved, and streams have come back to life. Costs amounted to an average US\$300 per hectare, exclusive of staff salaries, facilities and equipment such as office buildings, vehicles, equipment etc. Over the long term, application of natural regeneration techniques has proven to be more cost efficient and profitable than traditional plantation establishment.

Based on outputs, Myanmar's experiences demonstrate that it is never too late to rehabilitate degraded forest land even in harsh natural environments. But to succeed, rehabilitation should be people oriented. Furthermore, the general public and decision-makers need to have patience and understand that it will take time to bring about long term positive impacts.

NEPAL: *Forest Restoration at Landscape Level in Nepal* was presented by Messrs. Prayag Raj Tamrakar and Bernhard Mohns.

Nepal has a land area of 147,490 km² (14,749,000 hectares) located between 26° 22' to 30° 27' North latitude and 80° 04' to 88° 12' East longitude. It is about 800 km long (East-West) and 160 km wide (North-South). Physiographically, Nepal can be divided into the Terai (low land), Siwalik, and Mountain topographies. Elevation ranges from a low of 60m above sea level to 8,848 m (Mt Everest). Thirty five (35) different forest types have been

identified (JDA Stanton 1972). Although relatively small in area, Nepal has a wide range of climatic conditions: Tropical in Terai, Moderately sub-tropical in the hills and Alpine and Tundra in the high Himalayan mountains (DFRS, 1999)

Forest restoration and rehabilitation experiences are highlighted by successes in “Community forestry” which was initially understood to simply mean village-level afforestation. This perception changed after development of the Master Plan for Forestry Sector (1987-2007) which emphasized “People’s Participation” as the cornerstone of the Community Forestry Programme. Prior to the Master Plan, rehabilitation consisted principally of plantation establishment on degraded and denuded forest lands.

Rehabilitation activities were most evident in the Terai regions of Nepal where planting consisted principally of relatively fast-growing species, but also including *Dalbergia sissoo*, *Eucalyptus camaldulensis*, *Pinus roxburghii* and *Pinus patula*. However, the success rates were very low.

Policy reforms aimed at improving forest restoration eventually gave rise to a “Facilitate and Foster People’s Participation” approach wherein management responsibilities and authority would be shared by the Government with the concerned communities. NGOs and CBOs¹⁸ were motivated, trained and mobilized, to share responsibility for rehabilitation. Conservation and donor coordination were emphasized, resulting in support from many institutions including the DFID, GIZ, USAID, SDC, World Bank, Asian Development Bank, UMN, and others.

Plantation and Forest Management Research and Extension supported by the DFID assisted restoration on approximately 1.56 million hectares of denuded hills and degraded forests. The studies were a pioneering venture for the country. Community forestry practitioners have started adopting the results. Research began in 1984, prior to development of the Master Plan, and focused initially on enhancing management capability of Community, Leasehold and Buffer Zone Forest User Groups to cope with their responsibilities. Research studies targeted the hill region Nagarkot forest in the Kathmandu valley.

To test a range of forest management techniques, each treatment was designed to produce specific forest products. This provided real-life examples where community forest managers could see the results of different management treatments to produce different mixes of fodder, fuelwood, poles and timber. Six different treatments were applied in shrub to mature forests, *Schima castanopsis* (28 plots), *Shorea robusta* (21 sal and 13 hill sal), *Pinus roxburghii* (11 plots), *Quercus semecarpifolia* (3 plots) and others (6 plots).

Results after only five years showed dramatic improvements in terms of bio-mass increasing 16.7 tons per ha per year, of which 52% [8.7 t/ha] is fuelwood. Assuming a moisture content of 50%, the treatments applied would produce 109 backloads (4.35 t) of firewood yearly on a hectare of shrub land.

Looking forward, Nepal is expected to develop a revised 2nd Master Plan for the Forestry Sector, install monitoring and evaluation schemes under which forests are handed over, and reconcile local policies with global policies.

PAPUA NEW GUINEA: An electronic copy of the presentation “*Restoration of Fayantina degraded grassland area in Eastern Highlands, Papua New Guinea*” prepared by Simon Saulei of the PNG Forest Research Institute in Lae, was provided to participants at the discussions. Unfortunately, Mr. Saulei was unable to attend.

¹⁸ NGO-Non Government Organization; CBO- Community Based Organization

The restoration project described by Mr. Saulei is the first joint venture forestry project between local landowners and the Papua New Guinea Forest Authority (PNGFA) that will pilot arrangements for involvement in the international Reducing Environmental Degradation and Deforestation (REDD) initiative in PNG. Fayantia is located in the Haganofi District of Eastern Highlands Province. It is one of the five areas selected for implementing a REDD project. Under the Joint Venture arrangement, local residents have provided their land as equity, in addition to manpower for labour. The Papua New Guinea Forest Administration (PNGFA) is responsible for overall project management and the provision of financial and technical resources. The project aims to rehabilitate a degraded grassland, furnish employment, and share amicably among the landowners and PNGFA any financial benefits that may be derived from REDD.

Fyantia afforestation project was preceded by negotiations with the landowners comprising 13 registered Integrated Landowning Groups (ILGs). The joint-venture Memorandum of Agreement (MOU) was signed in 1987 between the ILGs and PNGFA. The MOU requires PNGFA to furnish financial resources to assist in developing and establishing the project and to install a processing plant to process timber harvested from the plantation to be developed. To date the project has planted more than 1,000 hectares of the 2,000 hectares customary land made available to the project. Plantations consist principally of *Pinus patula* and *P. strobus*.

Prior to becoming grassland, the site was covered by low and mid-montane forests. Deforestation and degradation were the result of traditional slash-and-burn shifting cultivation practiced over a long period of time. Initially, the early cultivators caused minimal impacts on the forests. But as the population grew and the need for more food increased, the cultivators cleared more forested land and fallow periods between planting cycles decreased. Soil fertility declined, thus creating ideal conditions for the incursion of grasses and weeds. Frequent burning maintained the grasses and inhibited natural regeneration of forest species.

The site is divided into 36 compartments of varying sizes ranging from just over 3 hectares to over 100 hectares. Roads and fire breaks have been established within and around the compartments to ease movements of vehicles and labour conducting maintenance work, fire prevention and control against damage. The project has also conducted awareness campaigns dealing with climate change, its impacts, and what communities can do to mitigate and adapt to such impacts. Awareness-raising activities include training on REDD.

While progress has been recorded, the following factors are preventing full achievement of targets:

- inadequate funds to pursue planned project activities;
- shortage of planting materials (seeds & seedlings);
- land disputes between: (i) the different land owning groups, and (ii) between the landowners and PNGFA;
- the threat that land disputes among 13 ILGs could lead to tribal fights;
- deliberate and/or controlled fires during the normal dry season and prolonged drought periods; and
- impacts of climate change, especially increasing temperatures, loss of soil moisture, increased rainy season precipitation that is causing landslips on slopes and flooding in the valleys.

In the context of FLR, the PNGFA has gained lessons that can help guide future initiatives. For example, landowner negotiations and registration of landowning groups took

more time than expected. There is also a need to develop capability to manage disputes between landowners, and between landowners and PNGFA.

Appendix 1 – Concept Note

Background

Globally, deforestation continues unabated. In the last few centuries we have lost more than half of the earth's original forest, and currently we continue to witness an annual loss of about 1 million hectares. The impact of such loss is felt far more acutely in the Asia-Pacific region which has only 18 percent of the global forest area, but 55 percent of the human population. In the decade 1990-2000, the Asia-Pacific region saw a cumulative loss of 1,275,000 hectares of forest. A large portion of the remaining forests have been subjected to destructive harvesting practices, fires, and shifting cultivation. The alteration has been so severe that they exist as fragmented, modified and degraded secondary forests, and often are devoid of the environmental protection values. In early 2000 it was estimated that in Southeast Asia alone, there exists ca. 100 million hectares of the remaining forests that are severely degraded and over 80 million hectares of forest land that was converted to agriculture and are now barren, or exist as grassland and shrub land.

The above situation calls for a massive rehabilitation of forests. The benefits are multi-fold: arresting erosion of biodiversity and ecological functions, enhancing timber production, strengthening livelihood opportunities for rural communities, and ensuring the various environmental services are safeguarded. In recent times, the role of forests in climate change mitigation has received heightened attention, and therewith renewal of interest in the rehabilitation of forests. Overall, this reflects the huge scale of opportunities, and the possibility of reversing the entire decline of forestry in the region through forest restoration/rehabilitation.

However, much of the rehabilitation work remained *ad hoc*, technical in focus, failed to address the underlying causes for degradation, and was not linked to socio-economic and development issues. This required a more holistic approach that integrates development within the forests, the surrounding landscape, and is linked with people's needs. Since early 2000 the concept of 'Forest Landscape Restoration' (FLR) has begun to emerge. FLR is an approach to manage the dynamic and complex interactions between people, natural resources and land use within a landscape. FLR brings people together to identify, negotiate and implement practices that restore the ecological, social and economic benefits of forests and trees within a broader pattern of land uses. It is defined as "a planned process that aims to regain ecological integrity and enhance human wellbeing in deforested or degraded forest landscapes".

Recognizing the need for a new approach to rehabilitate and restore large areas of degraded forests and denuded areas, many international, regional and national initiatives have been launched. Notable regional ones include Asia-Pacific Network for Sustainable Forest Management and Rehabilitation (APFNet) and ASEAN-Korea Forest Cooperation (AFoCo) which have made forest rehabilitation as an important component of their overall objectives. Several international initiatives have also been launched, one dedicated to promoting FLR being the Global Partnership on Forest and Landscape Restoration (GPFLR), an initiative led by IUCN, with FAO and other partners. The FLR theme received a significant political boost

at the ministerial conference in 2011 in Bonn, Germany – the Bonn Challenge was launched targeting the restoration of 150 million hectares of degraded land by 2020. This was followed up recently by APEC (August 2013) which pledged to boost their forest land by 20 million hectares by 2020. In order to meet this challenge, among other institutions, FAO is proposing the establishment of a new Forest and Landscape Restoration Facility. Reflecting the current developments, RECOFTC is raising the significance of the role of FLR in its new strategic plan being formulated.

Asia-Pacific Study

Recognizing the importance of FLR approaches for the Asia-Pacific region, FAO-RAP and RECOFTC launched an initial multi-country study to review the status of forest rehabilitation in the region, and the scope for implementing FLR approaches. The principle objective of the study is to contribute to the development of strategies, actions, and policy guidance for the sustainable restoration of forest resources reflecting multiple objectives, including conservation of forest biodiversity and genetic resources, and poverty reduction. The main outcome would be enhanced knowledge and capacity to address forest landscape restoration and related forest rehabilitation techniques through identification of best policies and practices.

Regional workshop

The multi-country study is organized to bring out: a) an overall synthesis paper; b) eight country case studies; c) a concept note for developing a regional program on FLR; and d) a publication synthesizing the main report with the country case studies. As part of these activities, a regional expert group meeting (workshop) is being organized in conjunction with the Asia-Pacific Forestry Commission (APFC) Session in Rotorua, New Zealand (3 November 2013). The participants would include the authors of the country studies, as well as selected international experts. Institutions such as ITTO, IUCN, APFNet, AFoCo and others who are strongly promoting forest landscape restoration efforts would also be invited. The APFC Session generally brings together senior forestry officers from the region. They too would add considerable value to the meeting's discussions.

The main objective of the workshop is to facilitate a partnership among institutions in the Asia-Pacific region for promoting a better understanding of the FLR principles and to guide implementation of related activities in the region. The specific objectives of the workshop are to:

- a. Provide a forum for familiarizing with the concept of FLR and all the related issues and identify opportunities to implement such an approach in their home countries;
- b. Review the country case studies, especially the unique approaches being undertaken by the individual countries, and how they would relate to other countries in the region;
- c. Facilitate partnership among institutions dealing with FLR and develop practical recommendations for their cooperation;

- d. Stimulate political support, policy and partnership arrangements, and identify investment needed to implement effective FLR activities; and
- e. Provide recommendations for developing a concept note for developing a regional program on FLR.

The structure of the expert group workshop would be as following:

- Welcome addresses (FAO, RECOFTC, Sponsors, Host)
- Introduction to workshop, mapping the opportunities for FLR, and increasing understanding of the related technical, socioeconomic, and policy issues
- Country case studies and discussion on the structure and content of final report
- Breakout Groups and Plenary: How to move forward – partnerships, investment needs, and political support
- Discussions and recommendations for concept note for developing a regional program
- Close of workshop

Appendix 2 – Programme

09.00-09.20	Welcome remarks: FAO & RECOFTC – <i>K. Shono & T. Tint</i>
09.20-09.30	Outline of agenda and setting the scene – <i>S. Appanah</i>
09.30-10.00	A review of forest rehabilitation in the Asia-Pacific region – lessons from the past – <i>Unna Chockalingam</i>
10.00-10.30	Shifting from forest rehabilitation to forest and landscape level restoration: why, how and what? – <i>David Lamb</i>
10.30-11.00	Coffee break
11.00-11.30	Forest and Landscape Level Restoration: We need more than techniques – <i>Don Gilmour</i>
11.30-13.00	Country reports – <i>Country authors</i>
13.00-14.00	Lunch break
14.00-15.30	Moderated discussion: Restoration methods for optimizing financial and livelihood benefits and improving biodiversity – <i>Patrick Dugan</i>
15.30-16.00	Coffee break
16.00-16.50	Moderated discussion: The way forward – <i>Andrew Ingles</i>
16.50-17.00	Closing – <i>S. Appanah</i>

Appendix 3 – List of participants

1. Simmathiri Appanah
2. Emma Castillo
3. Unna Chockkalingam
4. Patrick Dugan
5. Paul Evars
6. Don Gilmour
7. Sarah Dickson-Hoyle
8. Andrew Ingles
9. Ba Kaung
10. David Lamb
11. Lu Yuanchang
12. Min Thein Myint
13. Ani Adiwinata Nawir
14. Phan Sang
15. Apinita Siripatt
16. Kenichi Shono
17. Prayag Thamrakar
18. Tint Lwin Thuang
19. Luong Thawg
20. Phung Venh
21. Prasit Wangpakapattanwong