NEWSLETTER

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IN THIS ISSUE

PROJECTS

The inception of APFNet's first project in South America

The inception workshop of APFNet's first demonstration project in South America, Peru, called "Rehabilitation of Arid Ecosystems and Barren Lands through Agroforestry Systems in the Southern Coast of Peru [2022P1-PER]" was held online on Oct 20th, 2022. With total funding of USD 520,294,

of which APFNet is funding USD 348,540, the project will run for 24 months from October 2022 to September 2024. The project aims to develop an agroforestry system in degraded and barren lands to improve the livelihoods of poor rural families and mitigate negative climate change effects in the provinces of Chala, Camana and La Joya in the department (the first-level administrative sub-division) of Arequipa and the province of Locumba in the department of Moquegua.

A total of 18 people attended the online event, including participants from APFNet, the Supervisory Agency National Forest and Wildlife Service (SERFOR) Peru, the Executing Agency Costa Verde, the Implementing Agency Fundacion Para El Desarrollo Agrario (FDA), and beneficiaries of the Atiquipa and Pampa Sitana farm association. During the inception workshop, information about the project background, project goals and objectives, and the first-year project annual work plan were discussed.
The total land area of Peru is 128.5 million hectares with 78 million hectares of forests. Peru's forests are mainly tropical rainforests and semi-humid forests, however, the economy is also home to many arid and semi-arid forests, that, if disturbed, are easily degraded. As such, despite abundant natural resources, there are more than 10 million hectares of degraded land in Peru. While most of the degraded land is located inland and only 0.6 million hectares at the coast, more than 60% of the economy's population lives in this region. Therefore, prioritizing the rehabilitation of these degraded lands into healthy and productive areas through the use of livelihood-friendly systems, such as agroforestry, become imperative. A continuation of local degradation through unsustainable use may put at risk whole ecosystems, species, and people's quality of life while increasing the pressure on nearby landscapes.

Peru has made commitments to the 20x20 Initiative in 2014 to restore and rehabilitate a total of 3.2 million hectares of degraded land, comprising 2 million hectares for reforestation and 1.2 million hectares for rehabilitation in the coastal, Andean (highlands) and Amazon (rainforest) regions. In this context, APFNet's support of this project contributes towards the restoration goals for degraded lands in Peru. Also, APFNet's core strategic objectives, which promote restoration activities related to climate change, food, energy security and clean development, are reflected in the project activities.

With this in mind, the APFNet project will contribute towards the rehabilitation of degraded ecosystems and rehabilitation of barren land in exactly this area. The lomas and arid zone in the experimental sites are susceptible to climate change due to their formation relying on the moist dense fog and mist from the Pacific. Therefore, in this project, APFNet assists the establishment of site-adapted species and supports the installation of drip irrigation systems and water catchment meshes, which may reduce the negative impacts of climate change.

Additionally, the combination of establishing sustainable, locally adapted agroforestry sites and strategically connecting local stakeholders and partners in production and value chains will substantially contribute to the rejuvenation of the local economy. Such a network is currently not in place, as only rather small and isolated production systems exist trying to benefit from arid and degraded ecosystems.
Key project activities will be based on developing small-scale agroforestry production systems, while engaging local communities and local governments in close collaboration and coordination with regional governments and national institutions like SERFOR. These agroforestry systems will rely on

species that have proven effective for ecosystem services rehabilitation, as well as being adaptable to the extremely arid conditions on the sites. This specifically translates into the following 4 key outputs:

- Establishment 20 pilot units of 5 ha each (a total of 100 ha) for conservation, reforestation, and agroforestry plots in degraded lands
- Design of a value chain from the cultivation of the agroforestry products to final products ready for consumption
- Establishment of a small experimental unit for value-adding to the non-timber forest products.
- Elaboration of a project proposal to scale up for the rehabilitation of degraded ecosystems and barren lands based on the models demonstrated in this project.

Especially the last output is based on the vision that this project may introduce a new region-wide practice for the sustainable rehabilitation of the coastal region of Peru. If successful, the current barren lands may soon be transformed into green, lush mountains.

APFNet Explored New Way of Reducing Forest Degradation via Nitrogen Fixation Species Plantations

By the end of 2022, the APFNet project “Reconstruction and sustainable management of degraded forest based on the combination of inter-planting nitrogen fixation rare tree species and thinning” announced its completion in Bos Thom village, Khna Por commune, Soth Nikum, Siem Reap province, Cambodia.

Forest degradation reduces the quality and regeneration capacity of forests which in turn affects forests' ability to provide socio-economic and environmental services. Degradation of habitats and biodiversity severely diminishes the richness of forests and reduces their future use values. In Cambodia, due to a lack of financial resources and technical skills, no effective restoration models had been developed to differentially address varying degradation stages, and the restoration of degraded forests is very challenging. In this context, with the technical support provided by the Experimental Center of Tropical Forestry (ECTF) of the Chinese Academy of Forestry and the Institute of Forest and Wildlife Research and Development of Cambodia (IRD), APFNet funded and launched this project in January 2019.

The major goal of this project was to increase the level of forest resources restoration and promote forest sustainable management in Cambodia through the establishment of demonstration forests and technical personnel training, and to improve the livelihoods of local people. After a 42-month journey of project implementation, upon its completion, the project has demonstrated restoration models for different stages of degradation, while using nitrogen-fixing, high-value tree species to improve the soil health, principles from close-to-nature forest management, such as the removal of inferior trees and group-interplanting in forest gaps, were used. Additionally, the livelihoods in the local community also improved.

In Cambodia, many degraded forests are in community-managed areas with infertile and sandy soils. The project site, Bos Thom Community Forest is one of these areas with 445 ha of degraded forests and is located about 30 km outside of Siem Reap city in northwestern Cambodia. Due to poor management and monitoring, its forest land has been over-exploited, such as the illegal cutting of valuable tree species and firewood collection, which resulted in large forest canopy gaps, reduced biodiversity, and soil erosion. The village of Bos Thom has 300 people, and the local community makes a living by planting rice. The main source of their income relies on the sale of rice, beans, and cucumbers. However, given the fact that the agricultural land for each household is less than 1 hectare, the average annual income for one household is less than $300, which indicates an extremely dire financial situation.

The project team from ECTF and IRD first identified different degradation levels in the Bos Thom Community Forest area, and used integrated approaches, combining enrichment planting of precious nitrogen-fixing tree species, selective thinning and other silviculture practices to build a 50-hectare degraded forest restoration demonstration. The restoration approaches were also selected based on different forest stand structures and degradation levels. In severely degraded forests, native and valuable nitrogen-fixation tree species, such as *Dalbergia cochinchinensis*, *Pterocarpus macrocarpus*, *Afzelia xylocarpa*, and *Cassia siameca* were planted in sparse forests because these light-demanding species could use of the copious light available, and their fast-growing speed and high economic value will result in rapid improvement of forest structure and local livelihood improvement. In moderately degraded forests, the same target tree species were planted in natural forest gaps. This restoration approach has adjusted and improved the structure and composition of the former low-quality forests, formed a healthy forest ecosystem with multiple layers including trees, shrubs, and grass and gradually restored to a complex uneven-aged mixed forest with improved stand stability, quality and productivity. In the mildly degraded forests, dominant or foundation tree species, including *Peltophorum dasyrrhachis*, *Anisoptera costata*, *Pterocarpus macrocarpus*, and *Sindora Cochinchinensis*, with high economic value were selected as crop trees for cultivation. During this process, the structure of the current forest was maintained, but the proportion of high-value tree species and natural resilience was increased.

In Bos Thom Community Forest, the livelihoods of villagers have been significantly improved through various activities that have been conducted to provide benefits and incomes for the local community and reduce the pressures on forests in the meantime. A 20-hectare home garden using the agroforestry model was established, 20 households with solar energy systems were equipped, and a livelihood improvement revolving fund of $7,840 was established. In the home garden, this project inter-planted fruit trees, such as banana, papaya, coconut, or cashew nut which can provide short-term incomes, among the existing plants around local households. This has given local people an opportunity not only to improve the nutritional diversity of their food for daily consumption but also to enable them to sell to the local market. Each household generated USD 337 annually from vegetable cultivation. Additionally, to avoid cutting trees from natural forests, the project encouraged local people to plant trees for firewood around their houses. Furthermore, the installation of small-scale solar equipment provided adequate electricity to reduce overall expenses in the family by saving USD 57 annually on the electricity

Additionally, to share the information and knowledge of best practices on forest restoration and livelihood improvement, the project team held various technical training, and international seminars, and has published technical manuals in Chinese, English and Khmer. The documentary film and dissemination leaflets were also developed to share technical models and practical experience of tropical degraded forest restoration in Cambodia and other GMS economies. This project demonstrates a successful forest case study for the implementation of China's "Belt and Road" initiative.

Supporting Participatory Agroforestry for Erosion Control in Bengawan Solo Watershed, Indonesia

Large-scale deforestation and land clearing for intensive farming on the highly erosive and steep-sloped uplands of the Bengawan Solo Watershed in Indonesia have caused severe land degradation and soil erosion. How to rehabilitate this fragile ecosystem and prevent soil erosion became a national concern for Indonesia.

To solve this problem sustainably, an integrated approach using agroforestry and grey infrastructure using civil engineering methods at the micro-catchment level might be the solution. Starting in 2017, APFNet funded two phases (2017-2019, 2020-2022) of the project 'Development of participatory management of a micro-catchment in the Bengawan Solo Upper Watershed', which have now both been completed. The project selected the Naruan Micro Catchment (NMC) in the upstream area of Bengawan Solo River as a pilot site to showcase participatory measures to tackle soil erosion. To make sure that the needs of the local community and existing knowledge were sufficiently considered, this project used a participatory approach that involved local farmers in decision-making during planning, implementation and subsequent monitoring.

All measures were implemented with the local community, namely the farmers from the three villages in the NMC. To enable them to act effectively both throughout and post-project, the participating farmers were trained on several relevant topics, such as sustainable land management, construction of gully plugs, as well as on additional skills that would enable them to diversify their income generation, such as apiculture, coffee and avocado cultivation and waste treatment. This way they do not need to rely on cash crop production alone. The training was held in each village and was well received by the local communities (Fig.3). All pieces of training were a combination of theory and practice and were conducted by experienced trainers. As an incentive to apply the new skills, after the beekeeping training ten colonies of Trigona laeviceps (the stingless bee) were handed over to each village. The coffee workshops included training on cultivation, post-harvest processing and how to make different types of coffee drinks. After the avocado grafting training, the participants can reproduce avocado seedlings themselves and through learning grafting techniques plant productivity is expected to increase.

The APFNet-project has just been completed and therefore it is impossible to already see the long-term impacts of project activities. However, the analysis of data generated in Phase I already shows the advantages of using agroforestry (compared to tree monocultures or traditional agriculture) as it offers the best cost-benefit ratio to farmers. In this project phase, a policy brief on village-based participatory micro-watershed management addresses potential improvements in watershed management planning regulations, e.g. concerning the size definitions of managed areas and integration into village development programs. Moving forward, the NMC and its watershed management will function as a model for participatory watershed management in Indonesia. The methods for community participation and participatory intercropping designs are further shared through upcoming scientific papers and publications. The approach of agroforestry in combination with physical barriers, such as gully dams, will provide long-term erosion control and reduce the sediment load in rivers in downstream areas. Overall, the project has already made a positive impact in the area and beyond and is expected to continue to do so.

Nurseries provide seedlings for national reforestation program, parts of arboretum established in Myanmar: Completion of another project year

Myanmar is amongst the economies with the highest forest cover in the Greater Mekong Subregion. But not only are the forests extensive, as they are influenced by the climate of tropical

and subtropical monsoon mountainous areas, but they are also home to rare fauna and flora. These are also valuable sources of commercial timber and non-timber forest products (NTFPs), which support the livelihoods of the people of Myanmar. However, the overexploitation of forests for livelihoods through charcoal production, shifting cultivation, and encroachment has compromised this goal and led to the loss of forest genetic resources. A way to harmonize these demands had to be found.

Thus, in 2019 APFNet started the project "Integrated Forest Ecosystem Management Planning and Demonstration" in the Greater Mekong Sub-Region (Myanmar), which aimed to conserve the existing forest germplasm resources both in-situ and ex-situ and demonstrate the integrated management of the watershed, which is one of the key habitats of the rare species. In October 2022, the third year of the 5-year project ended, and despite previous obstacles posed by the pandemic project activities have been successfully continued to be implemented. As mentioned, one of the main foci of the project is the conservation of the diverse forest germplasm resources of Myanmar. More than 80 plant species are so threatened, they are already included in the International Union for Conservation of Nature (IUCN) Red list. Additionally, forest genetic resources are essential for forest-dwelling communities that rely on timber and NTFPs for food security, subsistence, and income generation.

In this context, the APFNet project established a breeding nursery in the first 2 project years and is currently establishing an arboretum inside the Forest Research Institute (FRI) in Yezin, Naypyitaw in Southern Myanmar, mainly to preserve species ex-situ, but also to provide seedlings for national reforestation efforts. The nursery is already running, in this project year it already provided 500 tree seedlings to Myanmar's National Tree Program. The arboretum, which is still under construction, completed the planting of various thematic zones on 16 ha in 2022, including the zone for medical plants, endangered tree species and the precious timber tree garden, and protected 9 ha of native forest zone out in parallel with the construction of an education centre, an entrance gate and the road system.

While the conservation of genetic resources in ex-situ gene banks is important, the in-situ conservation in forests and on farms is the most important measure to sustainably protect the genetic resources of tree species.

Thus, the second focus of the project is the implementation of integrated watershed forest management in the Palaung watershed. The watershed is located in Shan State. Many of this area's tree species are commercially important and rare. Between 2001 and 2010, the Shan State's net forest loss was the highest among the other states. The annual rate of deforestation is now 0.93% in the area. Consequently, many environmental and social issues, such as land degradation, soil erosion, lower water quality, and poverty, became a vicious cycle. In addition, population growth, limited alternative livelihood opportunities, poor environmental awareness and deforestation, and forest degradation by practicing shifting cultivation resulted in a worsening of the situation. Hence, how to implement the integrated watershed land and secure environmental stability is becoming a critical question for forest management in Shan State.

To enable the local people to carve out a livelihood while protecting the watershed, APFNet supported them to establish agroforestry plots to prevent erosion and decrease the need for unsustainable logging. In project year 3, the already established 37 ha of agroforestry demonstration plots were maintained and monitored (Fig.2a). The survival rate of planted trees on most plots was above 80%. Furthermore, a machine for the processing of turmeric, a highly valuable NTFP, was provided to the village community, which enables farmers to sell an added-value product (turmeric powder) instead of the raw material (Fig.2b), thus achieving a higher income. This activity is expected to promote small and medium enterprises at the village level. In the new project year, more than 3700 bamboo, timber and fruit trees will be planted in 16 ha of additional demonstration plots. These will be intercropped with seasonal crops.

Capacity building and knowledge transfer to the local community, local government and staff are also important objectives for this APFNet project, which aims to have a long-term impact and ensure sustainable forest management practices beyond the duration of the project. In this context, training for the village community on using the turmeric grinder machine was provided. Further training on the processing of turmeric powder and marketing as well as on agroforestry in combination with organic farming will follow this year. In addition, during the upcoming project year, several pieces of training for young researchers and local leaders on integrated forest management will be conducted. Also, the arboretum project site received its first study groups of students in year 3. In the upcoming project year, the arboretum will be further developed, e.g. by establishing a labelling system for plants in the thematic gardens and the education centre will be furnished, so the number of visitors and study tours are expected to increase over time.

APFNet-funded projects in Cambodia received terminal evaluation (TE) recently

The project “Reconstruction and Sustainable Management of Degraded Forests Based on the Combination of Inter-planting Nitrogen Fixation Rare Tree Species and Thinning [2018P4-CAF]” was implemented by the Experimental Center of Tropical Forestry, Chinese Academy of Forestry (ECTF) and Institute of Forest and Wildlife Research and Development, Forestry Administration of Cambodia (IRD). It is located in Bos Thom village, Khna Por commune, Soth Nikum, Siem Reap province, Cambodia. The major goals of this project are to increase the level of forest resource restoration and promote forest sustainable management in Cambodia through the establishment of demonstration forests models and technical personnel training, and to improve the livelihoods of local people through non-forestry livelihood activities.

With the methodology of document review, field site visit and stakeholder interviews, most of the activities received 'Highly Satisfactory' on the evaluation result. The project had achieved its objectives in terms of relevance, effectiveness, and efficiency. The social-economic-environmental impacts brought by the implementation of the project are particularly prominent:

- By demonstrating different restoration models and technical approaches to degraded forests, the forest structure was optimized, the ecological function was enhanced, the forest productivity was increased, and the forest resources were also protected by providing local communities with alternate energy-saving equipment.
- The livelihood of the local community was also improved through fruit trees and economic crops plantation, and the employment of the community was also increased by participating in the project activities.
- The forest management capacities and environmental protection awareness of local villagers were improved through technical training and awareness raising.

The project "Integrated Forest Ecosystem Management Planning and Demonstration Project in Greater Mekong Sub-region (Cambodia) [2017P2-CAM]" was executed by the Institute of Forest and Wildlife Research and Development (IRD) of Cambodia and supervised by the Cambodia Forestry Administration. It aims to rehabilitate and enhance the ecological services and produce provisioning of forests in Cambodia through the improvement of forest management capacities and the introduction of an advanced forest monitoring system, which all contribute to sustainable forest management in the Greater Mekong Sub-region.

A terminal evaluation was carried out during September-October 2022 to assess the project's performance, outcomes and impacts. After the evaluation, the consultant gave positive feedback on the project's performance. The project established a demonstration site for the rehabilitation and restoration of ecological services, improved forest productivity through the improvement of community forest management, and strengthened state-owned forest protection through forest

watcher installation and forest patrolling. Although the overall implementation of the project was good, many lessons were also learned and generated from the testing of the integrated forest management and restoration approaches, such as:

- The government has been making great efforts to protect forests, so it is the right direction of implementing projects related to forest management and restoration, and livelihood improvement through ago-forestry and home gardens. And to succeed in agroforestry and home gardening, a farm plan preparation is beneficial.
- The introduction of the water distribution system provided significant economic impacts to the local households, which is one of the significant impacts of the project.
- Forest restoration needs to integrate different skills in environmental, social and economic aspects.
- Livelihood improvement requires taking full account of the needs of local farms and increasing their motivation to participate in forest restoration activities. Species selection is one of the key challenges for project implementers, and the farmer's needs are very important for sustaining the activities of the community.
- For long-term sustainability, linking the farmer who practices agroforestry and home garden with traders would be essential since the traders know well about the market demand while local community members know how to plant.
- A home garden can potentially improve the income of the farmers. To promote this approach, a cost-benefit analysis should be conducted to understand the benefit of its productivity.

Continuous capacity building of project staff through on-the-job training with technical backing up from external experts is essential for maintaining the project achievements.

"Innovative Sustainable Forest Management Open Online Courses" project completion

To respond to the globally spread virus of COVID-19, with the support from APFNet, the APFECM Executive Office conducted the project "Innovative Sustainable Forest Management Open Online Courses in fall 2020", which offered 5 open Sustainable Forest Management online courses to the universities in the Asia Pacific region. The project was completed and closed by transferring the final payment to the Secretariat in December 2022. The project has attracted more than 1000 students registered for the courses. Forestry universities and institutes from China, Vietnam, Indonesia, Philippines, Japan, Malaysia, Thailand, Laos, Mongolia, Burma, Cambodia, and Chile also participated in the project.

EVENTS & ACTIVITIES

"Three minutes thesis competition" was conducted by APFECM successfully

Impacted by the COVID-19 pandemic, activities were all conducted online in 2022. Collaborated with UBC Forestry's Asia-Pacific Young Scientists Association (AYSA), The Asia Pacific Forestry Education

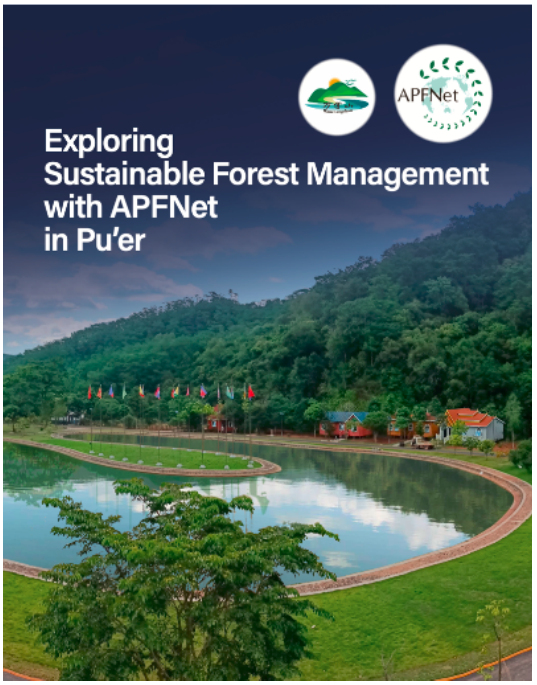
Coordination Mechanism (APFECM, launched by APFNet in 2010) conducted the finals of the "3 minutes thesis competition" successfully on 24 November 2022. Nine students from a group of 18 undergraduate and graduate students from 12 Asia-Pacific Universities who completed in the semi-finals have competed for the top prizes. The nine competitors were provided high prizes and certifications. The event provided fantastic opportunities for learning and practicing forestry knowledge for participants.

Updating monitoring and evaluation(M&E) policies

To further enhance APFNet's M&E function, in 2022, APFNet developed the first overall Monitoring and Evaluation Policy, ensuring that APFNet staff, consultants and partners have access to learn the general concepts and standards of M&E policy at APFNet, and better conduct or facilitate the M&E work of the organization.

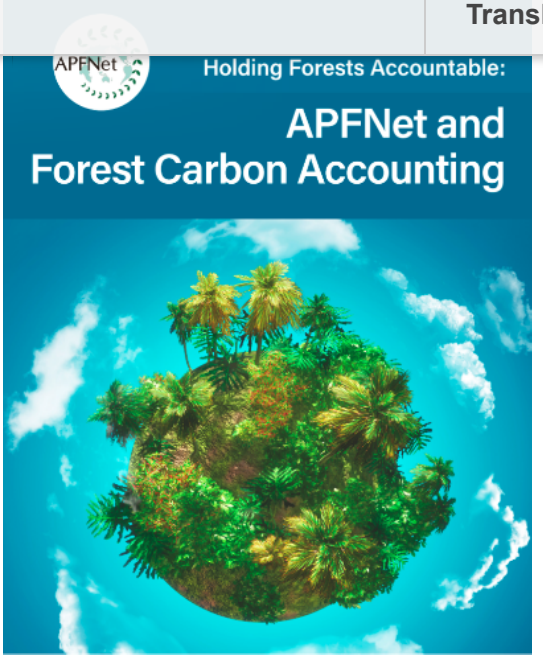
Meanwhile, to better support project planning, implementation and management, APFNet further updated the specific Guidelines for Project Monitoring and Evaluation (2013), which takes into account the experiences of APFNet project evaluation in the past ten years. The new Guidelines further regulate and improve the project evaluation criteria, frequency, priorities, procedures and relevant formats.

PUBLICATIONS



To promote SFM in an integrated manner that combines theory with practice, APFNet established the Sustainable Forest Management Demonstration and Training Base in Pu'er, Yunnan Province, which provides key facilities for forestry training, capacity building, conferences, forest experience, environmental education and much more. At this site, a wide variety of demonstration projects on SFM, integrated forest ecosystem management, agroforestry, and forest fire monitoring were also supported by APFNet. This book has been produced to describe in detail all APFNet activities conducted in Pu'er and give the reader a comprehensive understanding of the knowledge that has been gained so far.

recognizing the urgent need for further support on forest carbon accounting, APFNet has published a new milestone publication, titled: “Holding Forests Accountable: APFNet and Forest Carbon Accounting”. This book gives a comprehensive introduction to APFNet’s carbon-related projects. Ultimately, the aim is to leave the readers with new insights into carbon accounting and a good understanding of APFNet’s involvement in this area of work. The book covers mechanisms of international reporting on forest carbon, methodologies with which carbon can be measured, and then introduces methodologies that were tried and demonstrated in APFNet’s various projects.



The 10th edition of the APFNet Alumni Newsletter is already out!

In this issue:

- Graduation of Nanjing Forestry University’s 2020 APFNet Scholarship Students
- Tips for ASP students who plan to return to China
- APFNet Scholarship Students graduated with new HSK requirements
- Alumni Spotlight
- Alumni Research’s Achievements

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