

APFNet Annual Report 2023 Special edition for 15th anniversary

ABOUT APFNET

Mission

The Asia-Pacific Network for Sustainable Forest Management and Rehabilitation (APFNet) is committed to helping the economies and people of the Asia-Pacific region by promoting and improving sustainable forest management (SFM) and forest rehabilitation.

Objectives

- · Contribute to the achievement of the APEC aspirational goal of increasing forest cover in the region by at least 20 million hectares of all types of forests by 2020.
- Help enhance forest carbon stocks and improve forest quality and productivity by promoting the rehabilitation of existing but degraded forests and the reforestation and afforestation of suitable lands in the region.
- · Help reduce forest loss, degradation, and associated greenhouse gas emissions by strengthening SFM and enhancing biodiversity conservation.
- · Help increase the socio-economic benefits of forests in the region.

Priorities

- · Contributing to forest restoration
- · Reducing forest degradation
- Enhancing forest ecosystem functions

Implementation tools

- · Capacity building
- Demonstration projects
- Regional policy dialogues
- · Communication and information sharing

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15 YEARS AND BEYOND



2021

The APFNet Demonstration and Training Base at Wanzhangshan Forest Farm in Pu'er officially launched.

Third APFNet Strategic Plan (2021-2025) released

2023

The first Pu'er Forum on Asian Forests convened as a new regional high-level policy exchange platform. GFN officially launched.

2017

2020

The final the achievement of the APEC 2020 Forest Cover Goal initiated, led by APFNet.

The Cambodia **Breeding Centre** project launched.

2022

Chile joined APFNet as the 27th member

The first project in the Americas launched in Peru.

The Global Network for Sustainable Forest Management (GFN) adopted as one of the major deliverables of the High-Level Dialogue on Global

INTERVENTIONS AND IMPACTS



PROJECTS

53 funded projects

22 Asia-Pacific economies covered

3000+ ha of area SFM practice and 1400 ha Rehabilitation + Restoration

36 nurseries established

6.2 million seedlings cultivated

46 SFM plans (at various levels) developed

67 SFM demonstration tools and methods developed

200+ training and capacity building workshops held

114 rural communities benefited

9300+ people trained

POLICY **DIALOGUES FOR** REGIONAL **SYNERGY**

12 high-level (ministerial) events led/ co-organized/supported

20+ meetings, seminars, and workshops held to enhance regional exchanges, mutual learning and cooperation among government agencies

4 networks/dialogue mechanisms initiated for forest-related developments



152 project-related research papers, technical reports, books, and brochures produced and disseminated

20+ exhibitions and events to show APFNet works, views, and achievements

partners





INFORMATION SHARING

CAPACITY BUILDING & SCIENTIFIC RESEARCH

191ASP-awardees 143 graduated (male 112, female 79)

49 young scientists supported

14 online courses benefiting 168 universities and 5000+ students in the Asia-Pacific, 20000+ global learners and 35000+ views

30 thematic training courses for 400+ forestry officials

Funding for programs, projects, activities and events





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MESSAGE FROM THE EXECUTIVE DIRECTOR

The world sees rising awareness and a deepened understanding of forests' roles in addressing the most pressing challenges and securing mankind's future. Global efforts and closer cooperation to translate commitments and targets into actions and results have been more urgently needed than ever, especially at this halfway point to achieving the Global Forest Goals and Sustainable Development Goals (SDGs) by 2030. APFNet constantly spares no effort to help reboot, recover, and rebuild by promoting forest management and landscape restoration.

Before diving into 2024, we want to look back over the past 12 months on the stories told through our programs and events, and share the changes and impacts brought to forests and people dependent on them.

This report first draws your attention to the Global Network for Sustainable Forest Management. This program, officially launched in late 2023 and responding to the Global Development Initiative and other SDG-acceleration actions, would serve as a new channel to seek resources for forest projects that contribute to global SFM efforts and the achievement of SDGs.

We would also like to highlight the policy events that facilitate regional networking, enhance information sharing and mutual learning, and build stronger partnerships and synergies. The Third Ministerial Meeting of Ministers Responsible for Forests and First Pu'er Forum on Asian Forests, both highly welcomed and widely supported, were attended by senior forest officials. Knowledge was exchanged, potential explored, and consensus reached for future joint actions.

We've continued supporting our member economies and demonstrating in-field forest restoration and management in different climate zones. Holistic approaches are carried out, from scientific policy, strategy, plan development, and genetic resource conservation for future forests to local livelihood enhancement. Improved forest management has generated tangible and sustained benefits. Progress made in several projects is reflected in the report.

Thriving forestry and forests to meet sustainable development challenges wouldn't be possible without a good education and well-built capacity, and APFNet's investments in human capital never stop. With international travel restrictions lifted since 2023, some scholarship awardees have returned to campus to resume their study. SANFRI has restarted its financial support to receive visits and research programs by young forest scientists and researchers. Online courses have continued to support global learners regardless of distance and time differences.

2023 was unique since it witnessed the 15th anniversary of APFNet. To embark on a new chapter, APFNet took the opportunity to review projects and activities undertaken during the past 15 years and the current Operational Framework and summarized good practices, lessons learned, gaps, and challenges. Closing one chapter, APFNet stands ready to embark on another in 2024.

Finally, I would like to extend my sincere gratitude to all who have supported us over the past year, including the Board of Directors, Council representatives and contact persons, project appraisal panellists, partner organizations and agencies, businesses, and secretariat staff.

Lu De **APFNet Executive Director**





💷 24 October 2023 Pu'er, Yunnan, China

Background

China proposed the Global Development Initiative ? (GDI) in 2021 to support the timely achievement of the 2030 Agenda for Sustainable Development by revitalizing global development partnerships and supporting stronger, greener, and healthier global development.

In support of the Initiative, the High-Level Dialogue on Global Development was held in 2022 to invite global partnerships and actions. Establishing GFN, jointly proposed by China and APFNet, is one of the 32 Dialogue deliverables.

Official launch

Officially launched and welcomed at the First Pu'er Forum on Asia-Pacific Forests in 2023, GFN will be managed by APFNet as a programme, open to all countries, especially members of the GDI Group of Friends, and welcomes broad partnerships. Through GFN ?, demonstration projects, capacity building, policy dialogue, and information sharing will be carried out. The Pu'er Forum will serve as a senior think tank for the GFN operation.

A proposed project of The Asia-Pacific Forestry Technology Training Centre for Pacific Island Countries, already included in the GDI project pool supported by China, is expected to be inaugurated in 2024.

APFNet seeks various channels to fund more forest projects and events to contribute to global development. Following a serial update in project guidelines and Monitoring and Evaluation (M&E) policies in late 2022, concrete steps have been made to mature our capacity for project development, to normalize project implementation and cycle management, and achieve expected results.

Concept development and project design

New Criteria and Indicators (C&Is) and requirements have been applied in the call for projects and appraisal, resumed in 2023, and resulted in an improved alignment of project concepts with current APFNet priorities and a greater emphasis placed on the expected impacts.

Project M&E

Growing attention has been paid to properly disseminating and using M&E findings. Project Executing Agencies respond with feedback, especially corrective measures to M&E results, to improve remaining project performance and secure expected outcomes. An analytical review of over 20 project evaluations was conducted to summarize future project planning and implementation recommendations under various project themes and types. Meanwhile, a research study has been underway to prepare for APFNet's C&I system development to evaluate forest restoration.

Despite the lingering worldwide post-pandemic impacts, APFNet has made encouraging progress in projects addressing regional issues and demonstrating good practices. We see the closure of 2 projects and the ongoing of 11, among which 6 have been under active implementation and are ready to share their deliverables and impacts.







ESTABLISHING A COMPREHENSIVE EX-SITU GERMPLASM CONSERVATION SYSTEM IN CAMBODIA

Project title: Establishment of a High-value Tree Species Breeding Center in Cambodia **Project ID:** 2019P3-CAM

Supervisory agency: Forestry Administration, Cambodia

Executing agency: The Institute of Forest and Wildlife Research and Development (IRD) **Technical support agency:** Yunnan Academy of Forestry and Grassland, China (YAFG)

\$ 6.86m in total/5.49m APFNet fund
 01/2020-12/2027
 \$ IRD Campus Phnom Penh and IRD Research Station Siem Reap, Cambodia

Cambodia's forests, especially those with indigenous and high-value species, are severely threatened by deforestation and degradation. Comprehensive approaches should be applied holistically to halt and reverse the loss of forest resources and plant biodiversity. Building on the in-situ conservation efforts, more attention should be paid to producing high-quality seedlings for restoration and afforestation practices. Therefore, establishing an ex-situ germplasm conservation system by combining systematic seed collection with cutting-edge tree breeding techniques is urgently desired.

The project experienced slow start-up and activity delays during the pandemic. However, 2023 has witnessed a significant leap in genetic resource conservation of Cambodian valuable and indigenous tree and plant species. Project implementation has been technically secured with support and training from YAFG.

Training on Collection of high value tree species germplasm resources and intensive seedling cultivation © YAFG.



Seed collection and processing: **30% complete**

Collecting and storing germplasm of a wide range of species would be the first step in establishing a germplasm conservation system. This would be fundamental for seed and tissue production for tree breeding.

One hundred local plant species have been identified as collection targets, with market demands and biodiversity conservation considered. To date, seed collection has covered six provinces and been done for 32 species, including high-value tree species such as *Afzelia xylocarpa, Dipterocarpus intricatus, Anthocephalus chinencis, Dillenia hookeri Pierre, Irvingiamalayana, Dalbergia oliveri, etc.*

Multi-functional germplasm conservation garden in Siem Reap: 50% complete

A 100-ha Forest Genetic Resource Conservation Garden is under construction in Chan Sar Commune, Sonikom District, Siem Reap Province, featuring multi-functions of seed production, tree and plant collection, and SFM practice demonstration. Part of the area will serve as a botanical garden for the public.

So far, half of the conservation garden construction has been processed with more than 7000 seedlings of 9 high-value tree species planted in 9 ha, 10 fruit tree types planted in 3 ha, and 1.25 ha enrichment plantation established.

Seedling planting at the conservation garden @ Sreng Syneath, IRD





Progress in seedling production/key technical steps

	Species	Explant disinfection	Primary cul- ture (axillary bud induction)	Culture medium screening	Adventitious bud multipli- cation	Rooting	Transplanting
1	Afzelia xylocarpa	\checkmark	\checkmark	\checkmark			
2	Dalbergia oliveri	\checkmark	\checkmark	\checkmark	\checkmark		
3	Dalbergia cochinchinensis	\checkmark	\checkmark	\checkmark	\checkmark		
4	Pterocarpus marcropapus	\checkmark	\checkmark	\checkmark			
5	Sindora cochinchinensis	\checkmark	\checkmark				
6	Aquilaria crassna	\checkmark	\checkmark	\checkmark	\checkmark		
7	Altingia excelsa	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
8	Santalum albu	\checkmark	\checkmark	\checkmark	\checkmark		

The High-Value Tree Species Breeding Centre in Phnom Penh: 70% complete

The Breeding Center forms one of the project's centrepieces, with an expected annual capacity of 100,000+ seedlings. The 1,755m² compound would comprise a nursery greenhouse and a tissue culture building with high-standard facilities. Among the construction progress, a breeding lab has been upgraded, allowing seedling production already underway.

Eco-Forest Farm in Khun Ream

Experience has indicated that conservation or restoring landscapes should be coupled with sustainable livelihoods for local communities. Thus, an eco-forest farm has been designed to balance rural development and natural conservation through proper farming and forestry practices. 20 ha of farmlands and forestlands, demarcated in Khun Ream, Siem Reap Province, will be adapted by introducing plantings, livestock, and aquacultural cultivation. This demonstrates how farmlands/ forestlands can be managed for higher land-use efficiency for multi-benefits. Specifically, (1) multistory cropping will be applied to interplant fruit trees and high-value trees with vegetables for more efficient vertical layouts; (2) integrated farming will systemize crop production, forest plantation, aquaculture, and livestock farming to attract visitors for various rural experiences and diverse produce; and (3) soil conservation measures like mulching and organic fertilizers will enable the eco-sustained nutrient cycling for healthier soils and lands. Part of the income generated from produce sales and agricultural experiences will go to participating farmers, with the rest retained for business operation and site maintenance.

EXPANDING AN OASIS IN NORTHERN CHINA TO COMBAT DESERTIFICATION

Project title: Demonstration Project of Vegetation Restoration and Management and Utilization of Forest Resources in Greater Central Asia (Phase II) Project ID: 2019P4-INM

Supervisory agency: Chifeng Forestry and Grassland Administration, China Executing agency: Sanyijing Forest Farm, Aohan Banner, Inner Mongolia

- \$ 2.55m in total/ 2.05m APENet fund
- 01/2020-12/2023
- Sanyijing Forest Farm, Aohan Banner, Chifeng City, China

The GCA sub-region is one of the core areas of global desertification, where millions of people are exposed to land degradation and desertification impacts, aggravated by climate change. To respond to regional commitments to combating desertification and restoring landscapes, APFNet has invested over USD 2.55 million to implement a twophase project in Sanyijing Forest Farm from 2017 to 2023. The project aims to test and demonstrate desertification control and prevention models and tap economic values through forest restoration.

During phase II, the project team focused on the restoration and rehabilitation of 197.99 ha degraded lands, adhering to the following principles:

- including climate change
- resilient, and sound as windbreakers/shelters
- development) and cash crops (for produce sales)

 Planting diversified tree species for improved multi-functions and services of forest ecosystems, increased biodiversity, and stronger resilience to risks and challenges,

Selecting indigenous or suitable tree species that are drought tolerant, coldness

· Taking economic values into account to pick scenic viewing trees (for ecotourism



146 ha plantation established for semiarid land restoration

One-species planting was once the dominant practice in the forest farm for decades. To address the adverse impacts that monoculture plantations have brought and showcase multicultural planting, the project has demonstrated in 7 modules the mixture of various broad-leaved and coniferous trees in different combinations, proportions, planting patterns, and densities.

Module	Area (ha)	Species combination Planting pattern and mixing proportions		
М1	6.67	Mongolian pine (Pinus sylvestris var. mongolica) Siberian elm (Ulmus pumila)	Planted in strips, 6: 4	
М2	10	Mongolian pine (Pinus sylvestris var. mongolica) Golden leaf elm (Ulmus pumila cv. 'Jinye')		
М3	18.14	Mongolian pine (Pinus sylvestris var. mongolica) Winterberry euonymus (Euonymus maackii)	Planted in patches and strips, 2:8	
M4	18.93	Mongolian pine (Pinus sylvestris var. mongolica) Chinese wild peach (Amygdalus davidiana)		
М5	18.60	Chinese pine (<i>Pinus tabuliformis</i>) Shandong maple (<i>Acer truncatum</i>)	Planted in strips, 2:8	
M6	33.33	Shandong maple (<i>Acer truncatum</i>) Mongolian pine (<i>Pinus sylvestris var. mongolica</i>) Flowering peach (<i>Prunus persica</i>)	Planted in grids, patches, and strips	
М7	40.33	Sugar maple (Acer saccharum) Xinjiang's poplar (Populus alba var. pyramidalis) Mongolian pine (Pinus sylvestris var. mongolica)	Planted in grids and patches	



M1 site in 2019(L) and 2023(R) @ Liu Zhongyou

38.66 ha land enriched to transform degraded monospecific forests

Established in the 1970s-1980s, the farm's 4200+ ha poplar plantations have been severely degraded. Diversified trees have been planted to restore the degraded forests and gradually replace them with species more suitable for semiarid lands and climatic conditions. The demonstration site is divided into three zones, respectively enriched with conifer species (Picea asperata Mast, Pinus sylvestris var. mongolica) and broad-leaved species (Xanthoceras sorbifolium, Amygdalus davidiana, and Ulmus pumila). A sub-plot in each zone remains untreated for contrast monitoring.



Site before (L) and after (R) enrichment of Pinus sylvestris var. mongolica and Amygdalus davidiana @project team

Collection of suitable tree species

A 10 ha arboretum has been set up to collect, preserve, and demonstrate 40 types of trees and shrubs that thrive in sandy soils, including Mongolian pine (Pinus sylvestris var. mongolica), Yellowhorn (Xanthoceras sorbifolium), Siberian apricot (Prunus sibiricsa), and sea buckthorn (Hippophae rhamnoides).

Site maintenance was constantly done, including daily operation and construction of an 8-km fire patrol trail. "Site management and fire patrolling will be continued even after the project closure to sustain the project legacies." said the project director.







Restoration is beyond ecological targets and is always a process of social-ecological transformation. The APFNet-funded project *Integrated forest ecosystem management planning and demonstration in Greater Mekong Sub-region* covers Cambodia, China, Laos, Myanmar, Thailand, and Vietnam, which are sharing and nourished by the Mekong River, and aims to demonstrate how social and ecological impacts of the restoration process should be considered, planned and executed. Each participating GMS economy has chosen one project site, and means for restoring forests while sustaining livelihoods are trailered to address local situations.

ALTERNATIVE LIVELIHOODS FOR LANDSCAPE CONSERVATION

Project Title: Integrated Forest Ecosystem Management Planning and Demonstration Project in Greater Mekong Sub-region (Vietnam)
 Project ID: 2019P2-VNM
 Supervision Agency: Vietnam Administration of Forestry
 Executing Agency: Forest Inventory and Planning Institute, Vietnam
 Implementation Agency: Forest Resources and Environment Center

\$ 625k in total / 449k APFNet fund
11/2019 - 11/ 2024
Tram Chim National Park, Dong Thap Province, Vietnam



In the Vietnam site, located in the Tram Chim National Park and its buffer zones, people get help for livelihood alternatives so that pressure on the forest and wetland ecosystems would be much eased, leaving enough room for restoration efforts and tangible impacts in the long-term. During the last two years, despite difficulties in carrying out restoration activities such as wetland monitoring and patrol, the project team is still glad to see the positive results of livelihood improvements to the locals and their greater willingness to protect ecosystems.

Boat patroling @Tram Chim National Park



Pham checks beehives @ Forest Resources and Environment Center

A story of change: Now she sees things from a different angle

Pham Ngoc Hong lives in the Tam Nong District, Dong Thap Province. In her childhood, her home was rich with forests. Felling trees, hunting, and burn-slash for more farmlands were nothing unusual. As similar stories would tell, the later local development came along with unlimited extraction of natural resources and threats to biodiversity and environment, until the Tram Chim National Park was established at the end of the 20th century, and forest and wetland ecosystems have been under restricted protection afterwards. Pham's family could only subsist on a very small and unsteady income from farming.

Hearing of the alternative livelihood opportunity via the APFNet project support in 2020, Pham signed up without hesitation, and her family was lucky enough to win the beekeeping ticket through the community's public voting. Pham started her beekeeping business with ten beehives and 300 bees, guided by knowledge obtained from training and on-site practices. Quality of bee products with distinctive flavours are secured, thanks to the excellent water and soil conditions around the areas and rich plant species as good food sources for bees. Pham can earn 800 dollars a year by selling bee honey and is considering expanding her bee business.

Pham now has become a master of beekeeping. More importantly, beekeeping has changed her way of seeing and using natural resources. She now knows that ceaseless depletion from nature wouldn't last long, and people can win-win from protecting natural resources

Hoang Dieu Linh, the project leader



INTEGRATED WATERSHED FOREST MANAGEMENT WELL DEMONSTRATED

Project title: Integrated Forest Ecosystem Management Planning and Demonstration project in Greater Mekong Subregion (Myanmar) 🤗 Project ID: 2018P4-MYR Supervisory agency: Forest Department, Ministry of Natural Resources and Environmental Conservation of Myanmar **Executing agency:** Forest Research Institute

\$ 1.41m in total/1.12m APFNet fund 10/2019-10/2024 Paung Laung Reserved Forest, Pin Laung Township, Shan State; and Forest Research Institute Compound, Yezin, Nay Pyi Taw

Forest Genetic conservation-construction of the first arboretum in Myanmar (80% in progress)

In addition to collecting tree species for genetic conservation, best management practices will be demonstrated here.



Visual plan for arboretum construction

- Nursery upgraded to an annual capacity of 100,000 seedlings, 50,000 seedlings already cultivated and planted
- Greenhouse built up and put into operation
- 9-ha native forest ecological conservation zone established with various tree species planted
- 16-ha thematic garden 80% completed in species collection and planting



Integrated watershed management planning and demonstration - to balance ecological conservation and local livelihood development

The mid-term evaluation findings and recommendations

- Project implementation is on track
- attention to ensure project sustainability
- power and water supply should be secured



Padauk trees are growing well on the project site • An integrated watershed management plan has been formulated through a participatory approach.

• 40 ha agroforestry demo sites have been established in Paung Laung reserved forest watershed areas near Leinli village. Timber trees were mixed with fruit trees, and bamboo was planted to fence the demo sites.

• Training for young researchers, local officials, and farmers on integrated forest management technology and rehabilitation of degraded forests was half done.

• The knowledge of the chain of value has been well

communicated to participating community members, who have enthusiastically started turmeric processing.

· Land tenure and assistance on farmers' tenure registration deserve further

The Arboretum has been under good operation and maintenance, while stable



MODELING OUR FUTURE FORESTS TO ADAPT TO CLIMATE CHANGE

Project title: Adaptation of Asia-Pacific Forestry to Climate Change, Phase III: Synopsis, updating and extension of forest adaptation tools 🤗 Project ID: 2020P4-UBC **Executing agency:** University of British Columbia (UBC)

- \$ 164k in total/135k APFNet fund
- **12/2021 06/2024**
- 🕈 China, Malaysia, Myanmar, and Chinese Taipei

To further help policymakers and forest practitioners understand the impacts of climate change on forests and adapt decisions and actions for more resilient forests, the Climate-AP Project embarked on its third phase in 2021.

1

ClimateAP – a climate model

- Scale-free, high-accuracy climate data for the AP region
- 208 climate variables for any specific location for historical and future periods for individual years or time series
- A desktop package and a map-based web tool with a user-friendly interface
- Embedded in ArcGIS, users can access climate data and visualize climatic and species distribution maps locally or regionally.

Climate niche models

2

(CNM) apply a novel composite modeling approach that integrates multiple Random Forest models to model the climate niche of each species at a high accuracy (error rate < 10%). These models generate consensus projections of the geographic distribution of the climate niche of each species in multiple future climate scenarios.

FORECAST climate model

3

can be used for trade-off analysis to evaluate the impacts of various alternative managements and climate change scenarios on species/ forest productivity, water balance, nutrient cycling, and carbon storage. Outputs will allow forest managers, resource planners, and policy developers to generate targeted and adaptive management strategies.

Building on the deliverables of the first two project phases (2011-2015-2018), Phase III focuses on the tool update for more accurate projection and wider application.

- the development of an ArcGIS Map-based web tool for China.
- comprehensive tool for species selection in varied ecosystems.
- accuracy.

Research milestone for 2023

An academic paper, Assessment of the impact of climate change on endangered conifer tree species by considering climate and soil dual suitability and interspecific competition ∂_{i} was published on the niche modelling of tree species in Chinese Taipei. The study looked at red cypress as a case study to predict the impacts of climate change on suitable habitats considering climate, soil, and inter-species competition factors. Study results show that the suitable habitat for red cypress would decrease significantly in the future with an additional threat from the competition of an oak tree species. The approach and results may represent significant implications in making conservation strategies evaluating the impacts of climate change and providing the direction for the refinement of the ecological niche model.



• ClimateAP 🙀 features the inclusion of recent year climate data (2021-2023), the replacement of CMIP5 GCMs from IPCC AR5 by CMIP6 GCMs from IPCC AR6, and

• Tree species studied have been extended from 15 to 100 to offer a more

Climate niche models and soil niche models were refined to increase prediction

BY PROJECT INTERVENTIONS

A Climate AP application example: Climate-based experimental design and data analysis for higher efficiency and lower cost

In most forest-related research and programs, climatic-based experiments would be more effective than geographically-based experiments because the climate is the primary factor regulating the geographic distributions of forest ecosystems and tree species and the main driver affecting their health and productivity.

A typical example is the experimental design of the Lodgepole pine provenance trial in British Columbia, Canada. It has 60 test sites in the province and well represents the geographic distribution of this species. However, when plotting the test sites against the mean annual temperature (MAT), the most important climate variable for this species and generated from Climate AP, it was found that most of the test sites are located in a very narrow range of MAT and are redundant. A climatical-based experimental design would save 60-70% of the cost.



Geographic (L) and climatic (R) distributions of planting sites of the provenance test in British Columbia

RESTORING ARID ECOSYSTEMS FOR THE SOUTH COAST OF PERU

Project title: Rehabilitation of Arid Ecosystems and Wastelands through Agroforestry Systems on the Southern Coast of Peru
Project ID: 2022P1-PER
Supervisory agency: National Forest and Wildlife Service
Executing agency: COSTA Verde
Implementing agency: Fundacion Para El Desarrollo Agrario

\$ 520k in total / 348k APFNet fund

<u>10/ 2022 - 09/ 2024</u>

Pucchun (Camana, Arequipa region), Atiquipa district (Caravelí province, Arequipa region), Santa Rita district (Arequipa region), La Joya district (Arequipa region), Pampa Sitana (Moquegua city), Peru

In Atiquipa, the local communities mostly rely on agricultural activities (natural stands of tara and olive plantations) and cattle raising, and each family's monthly income is around 160 to 330 USD. Up to 91% of the water in the Atiquipa hills is sourced from the fog captured by vegetation; however, as the rainy seasons become shorter and dryer, people can't sustain their lives on crop fields, and the whole community may leave Atiquipa Vast arid and semi-arid lands are along Peruvian coastlines, particularly in the southern part, where an arid coastal belt—one of the oldest desert zones in the world—occurs. Long-time and intensive land use has degraded ecosystems and severely jeopardized local developments. Thus, transforming degraded lands into healthy and productive areas becomes imperative.

The project aims to develop agroforestry systems in degraded and barren lands to restore landscapes, improve local livelihoods by adding value to agroforest products, and mitigate the adverse effects of climate change in southern Peru.

Diego Padilla, COSTA VERDE biologist



Seedlings produced in nursery @ COSTA VERDE

Establishing and running nurseries

Two 600m² nurseries were established in Pucchun, each capable of breeding 50,000 seedlings a year, and a 250m² nursery was built in Loma of Atiquipa, with an annual capacity of 20,000 seedlings. Local farmers, trained in nursery management and phytosanitary control, have been involved in daily nursery operations. So far, 40,000 seedlings have been grown for project planting, and construction of two small nurseries is in progress, expected to produce another 40,000 seedlings every year.

BY PROJECT INTERVENTIONS



3-year-old Tara trees planted on degraded lands @ COSTA VERDE

Demonstrating agroforestry and restoration systems

The project has made fundamental progress in systematizing information about restoring degraded lands in arid and semi-arid zones in Peru. This involved a thorough review of documentation and interviews with key stakeholders for data collection. An environmental and socioeconomic baseline study report was developed on the Lomas ecosystems and selected barren land sites in Arequipa and Moquegua.

One of the most significant takeaways from our experience is the positive acceptance of the agroforestry models among smallholder farmers and local communities. These models have proven effective for productive purposes on barren lands, even under challenging soil and water conditions, and the implementation of drip irrigation systems has successfully addressed water scarcity issues, and enhanced the soil's moisture retention capacity.

Jorge Malleux, Project Director

Based on the survey report and the close-to-water location-selection criteria, a 25-ha stand was established to pilot and demonstrate agro-forestry practices. Caoba (*Swietenia macrophylla*) was selected as the experimental species to test adaptation and productivity, mixed with highly demanded crops like Moringa (*Moringa oleifera*), Aguayman-to (*Physalis peruvuiina*), Tara (*Caesakpinea spinosa*) respectively. At the same time, Tamarix (*Tamarix spp*) was planted to fence the site. 19,000+ seedlings and 7000 cuttings were used, and high survival rates were observed.

Another 30 (out of 50) ha of the rehabilitation stands have been set up in the Lomas ecosystems in Atiquipa and Tacahuay using natural regeneration and assisted natural regeneration approaches. The degraded lands are now covered with Moringa *(Moringa oleifera)* and crops.

Lomas are isolated, oasis-like pockets of vegetation sprinkled throughout the Peruvian deserts, and fogs coming from the Pacific Ocean condense and provide moisture that nurtures vegetation and sustains the local communities Six students from the Faculty of Forestry at the National Agrarian University were recruited to support project work, which facilitated their graduate thesis developments. Two shared learning experiences and feelings.

During her pre-professional internship, Korayma supported many project activities, including plantation condition assessments, weeding, planting, pruning, enrichment, irrigation system operation, and produce harvesting and sale. She also extracted soil and plant samples to calculate the accumulated carbon in the plantations as part of her thesis on the Assessment of Carbon Stocks in Agroforestry Modules.

19 A. VA

"The Agroforestry approach seeks not only to maximize agricultural productivity but also to preserve and restore ecosystems, thus ensuring a more sustainable future for lands and local farmers. Through these activities, I was able to apply the knowledge acquired at university and gained new insights into silvicultural practices, such as fruit harvesting and proper tree pruning." she said.



Korayma Olivares assesses tara and pitahay. @ Diego Padilla, COSTA VERDE

Project-based learning nourishes future foresters

In addition to evaluating agroforestry modules, and overseeing irrigation, and harvesting, Reyna Diaz actively participated in the production of pitahaya cuttings, the repotting of Aguaymanto, and various cultural activities related to agroforestry system management.

"This project is not only a beacon of hope for the southern coast of Peru but also an inspiring example of how we can redesign our environment and make green dreams flourish amid the desert." she said.

"Participation in the regional workshop on Experience Sharing in Land Restoration and Agroforestry Systems and discovering the fervent interests of fellow farmers in the project has solidified my belief that we are contributing not only to target communities but also to a broader shift in the perception of sustainable agriculture."



Experiences shared at the regional workshop on restoring degraded lands @ COSTA VERDE



EX-POST EVALUATION SHOWS SUSTAINED MICRO-CATCHMENT MANAGEMENT AND BETTER LIVES IN CENTRAL JAVA OF INDONESIA

The two-phase project at the Bengawan Solo Upper Watershed in Naruan Microcatchment in Indonesia 🤣 came to a closure in 2022 with following activities delivered.



- Detailed participatory land management plans developed
- 129 field partners selected from participating communities well engaged in participatory management
- 90 ha participatory plots established to demonstrate agri-silvicultural and non-crop agroforestry systems
- 58 erosion control structures and check dams built up to prevent further soil erosion
- · Capacity building and awareness-raising events, organized for 90 people on nonland livelihood alternatives and value-adding produce processing, e.g., beekeeping, coffee processing, and avocado cultivation and grafting

An independent evaluation carried out one year after the project closure has shown positive findings in replicating project deliverables and sustaining project impacts:



Most demonstration plots are likely to be sustained without any additional support. There is evidence that some non-participants are copying soil and water conservation measures introduced by the project.



All gully control structures are likely to be sustained for a reasonable period. Some community members have already replicated small bamboo-based gully control structures in their landholdings since bamboo's fast growth and green, renewable nature make them cost-effective vegetative barriers.



Coffee and avocado promoted by the project suit local conditions and are likely to be planted widely.



The project has enhanced the awareness and understanding of the importance of soil and water conservation among the targeted communities and beyond.

Project case: Livelihood improvement

The evaluator met three young individuals from Wonorejo and Bubakan Villages who have been instrumental in forming two youth groups in their respective villages and already started coffee processing and packaging business. Their products are of very high guality, and both groups sell their products through online marketing. With the support of a university team in a nearby city, they have developed high quality promotional material for marketing. It was also revealed that they have found enough demand for their products and look forward to expanding their businesses.



Coffee processing young entrepreneurs in Wonorejo (L) and Coffee processed by an entrepreneur in Bubakan (R) @Project team





Commemorative tree planting in Wengniute Banner, Chifeng City, Inner Mongolia. @Liu Wenzhe

Exchanges and dialogues are fundamental since shared understanding and synergies are more needed than ever to jointly address global challenges. In 2023, APFNet supported some events to facilitate regional connections and promote concrete cooperative actions.

THE THIRD MEETING OF MINISTERS RESPONSIBLE FOR FORESTRY IN GREATER CENTRAL ASIA

11 - 14 September 2023 • APFNet Forest Experience Base, Chifeng, Inner Mongolia, China

Under the APFNet-initiated Greater Central Asia Forestry Cooperation Mechanism, ministerial and high-ranking officials responsible for forestry developments from China, Kyrgyzstan, Mongolia, Tajikistan, Turkmenistan, and Uzbekistan met for the third time to strengthen forestry cooperation and promoting regional development. Meeting discussions covered the most recent advancements in laws and policies, priorities, actions, successes, obstacles, and areas where regional exchanges and cooperation are urgently needed.





Kyrgyzstan shared its remarkable forest cover increase and 4 forestry priorities of increasing forests' contribution to GDP, reducing poverty in the rural population, increasing forest cover by 10%, and reforming forestry with advanced techniques.



Mongolia introduced its reforestation efforts since 1970s, and policy and programs such as the Vision 2050, the national development goals, and the Billion Trees Initiative, to boost green development and ecosystem restoration.



Tajikistan focused on biodiversity, forest restoration, forest cover and productivity, ecosystem service enhancement, and entrepreneurs' engagements in the national forestry strategy development.



Turkmenistan's National Forest Plan 2021-2025 has set goals for reforestation and biodiversity conservation, sustainable forest management, conducting research, and strengthening legislation.



Uzbekistan emphasized its commitment to responding to the Bonn Challenge by restoring 500,000-ha forestlands. To fight desertification, actions have been taken to increase afforestation sites and survival rates, and progress seems promising.

China shared its experience in desertification prevention and control, such as strong political will, systemization of laws, regulations and policies, workforce development, and incentive

Representatives agreed on the following cooperation priorities:

1. Vegetation restoration in arid and semi-arid areas.

2. Sand-based industry development such as agroforestry, pasture and ecotourism, etc in the areas affected by desertification.

3. Transboundary cooperation on forest, grassland fire prevention and control.

4. Conservation and utilization of forest and grassland genetic resources.

5. Promoting capacity building of forestry and grassland professionals,

6. Promoting forestry, grassland scientific research cooperation and exchanges.

7. Improving the livelihoods of communities in extremely decertified areas by transforming them into pastures dotted by clusters of shrubs.







APFNet Forest Experience Base @ Wangyedian Forest Farm Chifeng, Inner Mongolia, China. Where you can experience multiple functions and services of forests on semi-arid lands and see local developments well balanced with sustainably managed forest ecosystems.

THE FIRST PU'ER FORUM ON ASIA-PACIFIC FORESTS

III 24-26 October, 2023 • APFNet Demonstration and Training Base Pu'er, Yunnan, China



Pu'er Forum delegates with locals - Bulang and Dai people

> 150 representatives of government agencies, research institutions and academies, IGOs/NGOs, and the private sector from 14 Asia-Pacific countries gathered at the event, where high-level segment and workshops were organized.

Speeches, presentations, and discussions at the Forum reveals that Asia and the Pacific have placed increasing importance on the role of forests in green and sustainable development, responding to climate change, and protecting biodiversity. They have strengthened legislation, updated their national policies, improved forest sector planning, and carried out large-scale afforestation and restoration operations. However, several areas require further attention, including forest/land tenure reforms, financial support, and capacity building to balance conservation and development and enhance forests' contributions to national economies. It is widely supported that regional exchanges and cooperation should be strengthened to benefit all.

The Forum witnessed an MoU signed between APFNet and the Ministry of Fisheries and Forestry of Fiji on Promoting the Sustainable Development of the Sandalwood Industry in Fiji, and another four cooperation agreements signed on forest genetic resource conservation and culture; joint academic degree programs, visits and exchanges, and trans-border cooperation; promotion of sustainable timber supply chain; and business cooperation.

The Forum has laid a solid exchange platform for regional forestry policy, planning, industry, technology, and education. It is strongly recommended that the Forum be further enriched and continued in the coming years to significantly contribute to achieving the common goal of sustainably managed forest resources in the Asia-Pacific region.

Action Plan for Pu'er Forum on Asia-Pacific Forests (2023-2025)

- during the Forum.
- October 2025
- 3. Island Countries will be launched in Fiji in 2024.
- Mekong Sub-region.
- Asian tea farmers.
- to pursue postgraduate degrees in China.



Pu'er Forum workshop

Signatories will actively implement the cooperation agreements signed

Stakeholders will collaborate and prepare for the second Pu'er Forum in

The project the Asia-Pacific Forestry Technology Training Center for Pacific

Young forestry scholar exchanges among China and ASEAN members will be supported through the APFNet-initiated SANFRI mechanism.

The Summer Camp for Greater Mekong Sub-region Forestry Undergraduates Program and the GMS Forest Restoration Demonstration Project will be supported by the Presidents' Forum of Forestry University/Institute in Greater

International training courses will be organized for South and Southeast

A scholarship program will be established jointly by APFNet and Anhui Gujing Distillery Company Ltd. to support Cambodian and Laotian foresters





During the field trip - at China Tea Expo Garden







APFNet Demonstration and Training Base

@Wanzhangshan Forest Farm, Pu'er, Yunnan, China.

With joint efforts, the APFNet Pu'er base is now in operation as a replicable model for sustainable forest management in similar climate conditions. In addition to demonstrating SFM models and practices, the base serves as a training and exchange centre for professionals and an educational and experience hub for the public.

Education and Capacity building focus on developing the technical and policy/managerial competencies of forest professionals and practitioners and improving their capacity for mastering new techniques and tools, to effectively address the challenges of the forest sector and ensure that forests contribute to the region's sustainable development.

APFNET SCHOLARSHIP PROGRAM (ASP) in 2023



Study achievement



Wai Nyein Aye, Myanmar, Forests, BFU

Wai started her academic journey in 2017 for the ASP Master in Forest Economy and Management and continued with the PhD program in Forests since 2019.

Due to the global pandemic, Wai's study and campus life were severely disturbed. Travel restrictions, cancelled classes and lectures, and the difficulty of collecting research data on time put her under tremendous stress, and she was often in two minds about continuing her studies.

The turning point came with virtualized ASP programs, supplemented with other online courses, lectures, and training programs. Under guidance and support from her professor, Wai modified her research focus and methodology and finally passed the defence after repeated thesis revisions. Now, Wai has resumed her work at the Forest Department of the Ministry of Natural Resources and Environmental Conservation in Myanmar. Deeply aware of the significance of research-based policy development and decision-making in promoting SFM, she has once again confirmed her mind as a forest researcher.



ASP students and alums have enhanced networking, especially academic exchanges last year, mainly via the quarterly alumni newsletters.

Click here to visit ASP Alumni Network!

REGIONAL EDUCATORS EXPLORED WAY FORWARD



The Sixth AP-FECM General Assembly, 15-17 August 2023, Kunming, China

As the primary channel to connect members and stakeholders, discuss current hot and trending issues, and envision future development of higher forest education, the AP-FECM General Assembly convened for the sixth time with representatives from 34 universities and institutions.

Opportunities, challenges and solutions

Speakers shared insights on online education during the pandemic, AI applications in forestry education, the transition of forestry education, the impacts of the new forest industry on shaping future green jobs, expectations and trends in forest education, and possible priorities for future regional cooperation.

AP-FECM online course project

The 14 online courses developed under the AP-FECM collaborative project Innovative Sustainable Forest Management Education in the Asia-Pacific Region have been valueadded for global learners. Three actions were proposed for future project development, i.e.: (1) new course development on forest governance, new technology application in forestry, and agroforestry; (2) voluntary sharing of more course materials from AP-FECM members; and (3) course articulation and credit exchange among AP-FECM member universities.

CONTRIBUTION TO FORESTRY EDUCATION, RESEARCH, AND CAPACITY BUILDING

Presidents' Forum of Forestry University/ Institute in the Greater Mekong Sub-region (GMS), 4-8 September 2023 Kunming, China



Institutional updates The AP-FECM steering committee was renewed with 13 universities,

UBC was elected as the new Chair, and BFU and SWFU as co-chairs.

With support from APFNet, the Presidents' Forum of Forestry University/Institute in the Greater Mekong Subregion (GMS) was attended by presidents, heads, and senior representatives from 14 forest universities, research institutes, and government agencies in Cambodia, China, Laos, Myanmar, Thailand, and Vietnam, as well as representatives of regional organizations.

The status of forestry education, research, and related international cooperation were shared. It was commonly realized that sustainable management and use of forests rely on science-based planning, decisions, and technology and innovations, thus posing higher requirements and new challenges to forestry education. In this sense, a closer networking and cooperation mechanism would benefit regional stakeholders through enhanced exchanges and mutual learning, and collaboration in the broader application of research deliverables.

It was recommended that the forum be convened biennially in the future, and joint programs be explored further.

SINO-ASEAN NETWORK OF FORESTRY RESEARCH **INSTITUTES (SANFRI)**



Fourth SANFRI steering committee meeting emphasized a closer research collaboration among member institutes and enhanced technical guidance to/and support for young researchers

Institutional matters

The fourth SANFRI Steering Committee

Meeting was held on 19 September 2023 in Hanoi, Vietnam, with SANFRI guidelines updated, 2022-2023 work reported, and the work plan 2024-2025 adopted. Dr. Ismail Parlan, Forest Research Institute of Malaysia (FRIM), and Dr. Andes Hamuraby Rozak, National Research and Innovation Agency, Indonesia, were elected as the incoming chair and vicechair.

Vietnam and Laos	Research on rev restoration towa
Malaysia	Documenting th germplasm con
Indonesia	Tree seed suppl forest and lands

The third Early Career Academics Forum gathered SANFRI steering committee members and Young Scholar Team members for mutual learning and idea inspiration. The academic exchanges covered updates research progress and findings, and discussion on future collaboration.





Ms Chhit Sophal, research fellow, IRD, experimenting on tissue culture

SANFRI-supported programs

Application and appraisal of the Visiting scholar program (VSP) were resumed in 2023 and five applicants won the chance to visit YAFG for 6-month stays. In 2023, VSP received four researchers' academic visits.

Three applications were selected for **Research Grant support** in 2022-2023 cycle.

vision of policies to promote natural forest ards sustainability in Vietnam and Laos

ne insect natural enemies of insect pests in ex-situ servation of Aquilaria malaccensis

ly management model and policy for supporting scape restoration in Indonesia

CONTRIBUTION TO FORESTRY EDUCATION, RESEARCH, AND CAPACITY BUILDING

SANFRI RESEARCH FINDINGS



A native evergreen broadleaf tree, fast growing species suitable for large timber plantations in Vietnam

"The propagation of Lithocarpus ducampii (Hickel & A.Camus) a.camus seedlings by using super-light and self-decomposing (SLSD) bags to improve effective forest rehabilitation," supported by the SANFRI research grant, was completed in April 2022 by Dr. Nguyen Van Tho, Forest Science Center for Central Northern Vietnam, and partner researchers.It has passed an technical review in 2023 for official closure.

Why the research?

- 1. *Lithocarpus ducampii* is a local species suitable for intensive large timber plantations, to support Vietnam's forestry development strategy 2021–2030 targets.
 - Ordinary plastic bags, widely used for *Lithocarpus ducampii* seedling production, are observed to be linked with lower survival seedling rates, higher labour costs, and pollution issues.

The research intended to identify (1) the potting substrate best for root development and seedling growth of *L. ducampii* and (2) to prove the SLSD bags contribute to higher seedling survival rates and lower production costs.

Experiment conduction

- . Good fruits collected for seed production.
- Five substrate formulas in plastic/SLSD bags set in 3 groups for period observation and measurements.

Findings and recommendations

- . The survival rate of plants grown in SLSD bags is higher than in plastic bags.
- 2. The cost of producing seedlings with SLSD bags is 50-70% higher while labour costs are lower.
- 3. SLSD bags bring less environmental pressure.
- A wider application of SLSD bags in seedling production should be considered.

APFNET AT EVENTS & COOPERATION

In 2023, the APFNet secretariat attended several international conferences and events, including the 62nd IUFRO Board Meeting, the 18th Session of UNFF, the 30th APFC Session, the Forest Landscape Restoration (FLR) Asia Investment Forum, and ITTO's Global Legal and Sustainable Timber Forum. Updates of APFNet's work were shared through speaking at side events and exhibitions.

APFNet maintained its connection and cooperation with partner organizations by meeting with IUCN and TNC to explore collaboration, and a joint APFC30 side event with APAFRI, CIFOR, RECOFTC and so on. APFNet also follows closely on FAORAP-led regional FLR programmatic work and joined the RESULT Asia Initiative Network (RAIN) as a member.

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The website and social media platforms were under regular maintenance and content updates. Routine communication products include the annual report 2022, quarterly newsletters, and two project summary reports. In celebration of APFNet's 15th anniversary, promotional products were made and widely disseminated, including an anniversary logo, a commemorative video, a set of brochures, and 20+ project posters.

@APFC30 Marketplace event

New publication

To improve forest quality and rehabilitate the degraded lands in Cambodia, APFNet funded the project "Rehabilitation and Sustainable Management of Degraded Forests Based on a Combined Approach of Interplanting Nitrogen-Fixing Rare Tree Species and Thinning" in Bos Thom Village, Siem Reap Province, Cambodia.

This report provides a detailed account of outputs and experiences in improving forest ecosystem services and the socio-economic status of people living in degraded Cambodian forests through various activities.



Root measurement



Information dissemination

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INSTITUTIONAL MATTERS

THE SEVENTH MEETINGS OF THE BOARD OF DIRECTORS AND COUNCIL

26-28 April 2023 *Quantum Philippines*

Two meetings were held in conjunction and in a hybrid format. It was the first in-person gathering for the Board and Council members after the pandemic.

The Council heard APFNet's work progress in 2022, planned activities and budget for 2023, and agreed to review the APFNet Operational Framework for modification and initiate the Project Appraisal Panel renewal procedures. At the Board meeting, Dr John Innes was appointed Vice-Chair, and Mr W.T.B. Dissanayake's term was extended. Based on the Council's comments, Board members reviewed and approved the proposed APF-Net work plan and budget for 2023. Upon the offer from Thailand, the Eighth Meetings of the Council and the Board of Directors will be held in 2024, to be hosted by the Royal Forestry Department.

Board of Directors

Dr Guan Zhi'ou, Chair

Administrator, National Forestry and Grassland Administration, China

Dr John Innes, Vice-Chair

FRBC Chair of Forest Management Professor (former Dean) of Faculty of Forestry, University of British Columbia, Canada

Dr Lu De, Secretary Executive Director of the APFNet (Non-voting Director)

Ms Margaret M. Calderon

Professor of Forest Resources Management and Director Institute of Renewable Natural Resources, College of Forestry and Natural Resources University of the Philippines, Los Baños

Ms Novia Widyaningtyas

Senior Advisor to the Minister for Industry and International Trade, Ministry of Environment and Forestry, Indonesia

Mr Mohd Ridza bin Awang

Director General, Forestry Department Peninsular Malaysia

Mr Chan Ponika

Deputy Director General, Forestry Administration. Cambodia

Dr Pem Narayan Kandel

Chief Policy Advisor, International Centre for Integrated Mountain Development (ICIMOD), Lalitpur, Nepal

Mr W.T.B. Dissanayake

Consultant, Former Secretary of Ministry of Mahaweli Development and Environment, Sri Lanka

Mr Fan Kejun

Deputy Director General, Natural Resources and Ecological Environment Department, Ministry of Finance, P. R. China (Non-voting Director appointed by the host economy)

AUDITED FINANCIAL INFORMATION

Income and Expenses statement for the year ended 31 December 2023 (USD)

	2022	2023
INCOME		
Home economy donation	3,869,998.17	4,790,349.93
Other income (interest)	4,648.83	3,589.45
TOTAL INCOME	3,874,647.00	4,793,939.38
EXPENSES		
(1) Program expenses	1,708,538.46	2,509,400.98
(2) Management expenses	2,097,261.29	2,142,650.89
(3) Financial expenses	79,962.65	10,459.74
TOTAL EXPENSES	3,885,762.40	4,662,511.61
SURPLUS (DEFICIT) FOR THE YEAR	(11,115.40)	131,427.77

Program Expenses by four implementing tools (million/USD)





AUDITED FINANCIAL INFORMATION

APPRECIATION TO THE PARTNERS

Chifeng Wildlife Conservation Association

Chifeng Forestry and Grassland Bureau

COSTA VERDE NGO, Peru

Ecology and Nature Conservation Institute, Chinese Academy of Forestry

Forest Administration, Cambodia

Forest Department, Myanmar

Hainan Nature Foundation, China

Jian Feng Test Station, Research Institute of Tropical Forestry, China

Lexiang Nature Education Research Center, Ledong Li Autonomous County, Hainan Province, China

National Forestry and Grassland Administration, China

Pu'er Municipal Government, Yunnan Province, China

Sanyijing State-owned Forest Farm, Chifeng, China

Southwest Forestry University of China

The University of British Columbia, Canada

Vietnamese Academy of Forest Sciences

Wangyedian State-owned Forest Farm, Chifeng, China

Yunnan Academy of Forestry and Grassland, China

Partners counterpart contribution totals USD 1,328,523.79 to APFNet programs and events in 2023.

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