Biodiversity and Watersheds Improved for Stronger Economy and Ecosystem Resilience

(B+WISER)

Transforming Forest and Biodiversity Protection in the Philippines

SUMMARY OF ACCOMPLISHMENTS

2012 – 2018

USAID
FROM THE AMERICAN PEOPLE

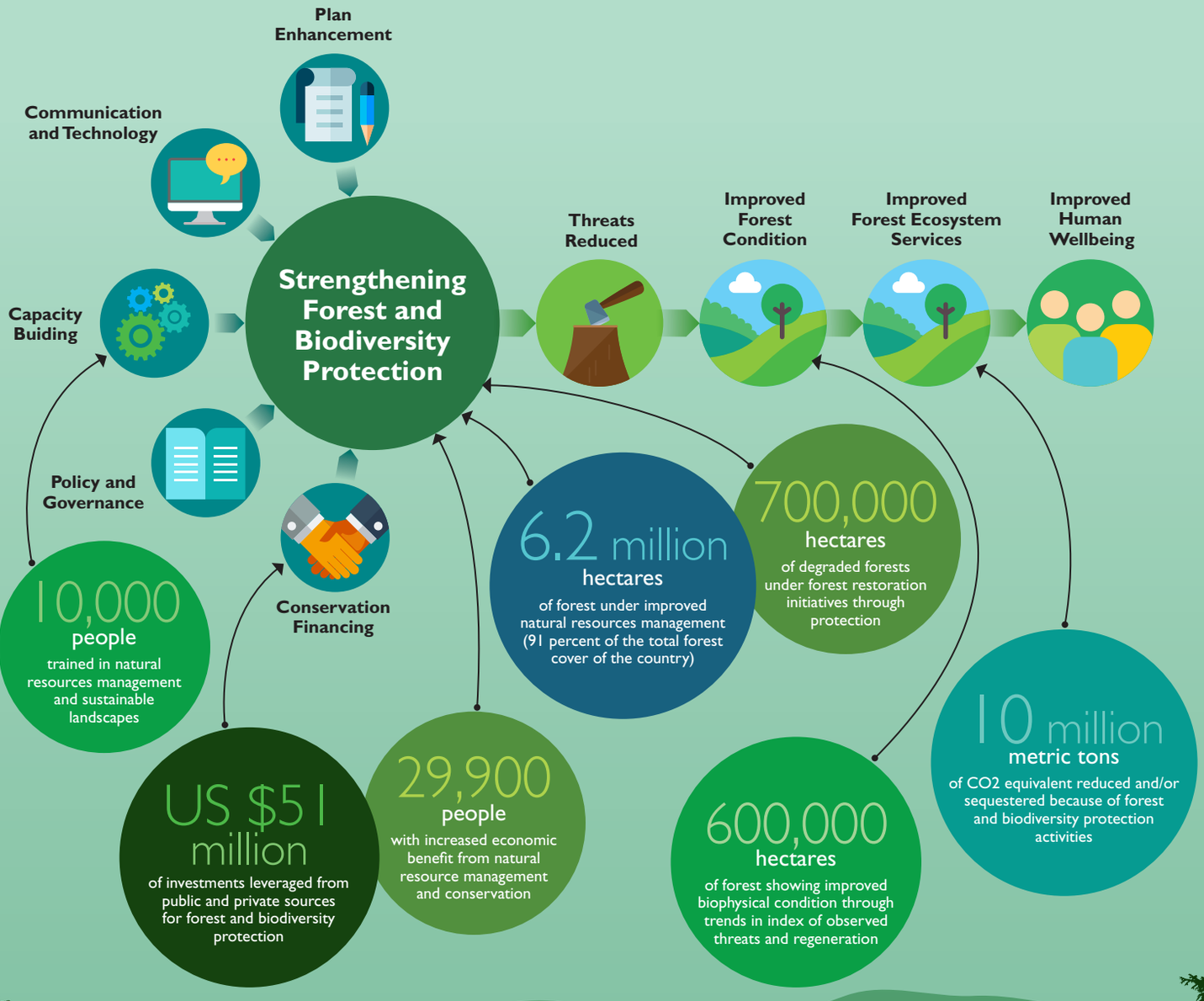
Background

The Philippines has seen a drastic decline in forest cover. Due to continuing threats such as slash and burn farming and illegal logging, the forest remains under pressure. This drives many forest dependent species to the brink of extinction and exacerbates the country's vulnerability to natural disasters. Likewise, ecosystem services to Filipinos, such as clean water and air, as well as the livelihoods of upland communities, are being threatened. Responding to these challenges, the Department of the Environment and Natural Resources and the United States Agency for International Development partnered in 2012 to implement the Biodiversity and Watersheds Improved for Stronger Economy and Ecosystem Resilience (B+WISER) program. The B+WISER program aimed to conserve biodiversity in forest areas, reduce forest degradation in priority watersheds, manage forests, monitor low emissions development, and increase capacities for biodiversity conservation and disaster resilience in vulnerable areas. Through its work, the program contributed to transforming the way the Philippine government implements forest and biodiversity protection. B+WISER introduced a practical approach with a focus on science-based conservation targets that used forest cover change assessments in forest conservation area planning. It coupled this approach with purpose-driven patrolling and improvements to responses to threats with simple written protocols; a data-driven system to better allocate resources and determine effective responses; and a template for forging partnerships with the private sector, local communities — including indigenous peoples groups — and other governments to leverage investments in forest protection, including mangroves. Fostering ownership, the program enhanced the capacities of government agency staff in forest protection involved in planning, patrolling, responding to threats, managing data, and working with various groups to reduce pressures on the forests. The adopted approach, the Lawin Forest and Biodiversity Protection System (Lawin), helped shore up the once marginalized forest protection system, complementing the government's active forest restoration approach under its National Greening Program.

B+WISER applied a range of interventions linked directly to Lawin that supported sustainable, resilient management of forested areas and watersheds. The program leveraged several conservation finance options, including national budget allocations, payments for ecosystem services, and private sector investment. Staff engaged local community groups in active reforestation efforts and advanced passive restoration programs, increasing biodiversity for crucial upland forests and mangroves. The program also worked to improve environmental services, including recovery from — and resilience to — various stressors. B+WISER further supported improvements in resilience by assessing vulnerabilities and including resilience considerations in land use and local development planning. The program's governance work improved environmental law enforcement and protected area management and local governments' use of partnerships and financing for more effective natural resource management. The program integrated activities fostering inclusion of women and indigenous people in forest, protected area, and watershed management across B+WISER's work.

On the cover: DENR forest patrollers in Masinloc, Zambales conduct a Lawin patrol in a forest conservation area to address and record threats, indicator species and forest condition using the CyberTracker app.

B+WISER's strategic interventions and key results



Lawin Forest and Biodiversity Protection System

In order to address the issue of forest cover decline, the Philippine government has faced challenges in prioritizing its efforts in light of strained budgets and inadequate information to make timely and appropriate decisions in protecting the remaining forests and the biodiversity that it contains. At the same time, the government has faced challenges in prioritizing its efforts in light of strained budgets and inadequate information to make timely and appropriate decisions. Lawin helps address these issues by applying science to identify high conservation value areas and targets. Forest conservation area plans spell out these targets, defining conservation objectives, desired future forest conditions, and management interventions to achieve them. This provides a sound basis for work prioritization, given limited resources.

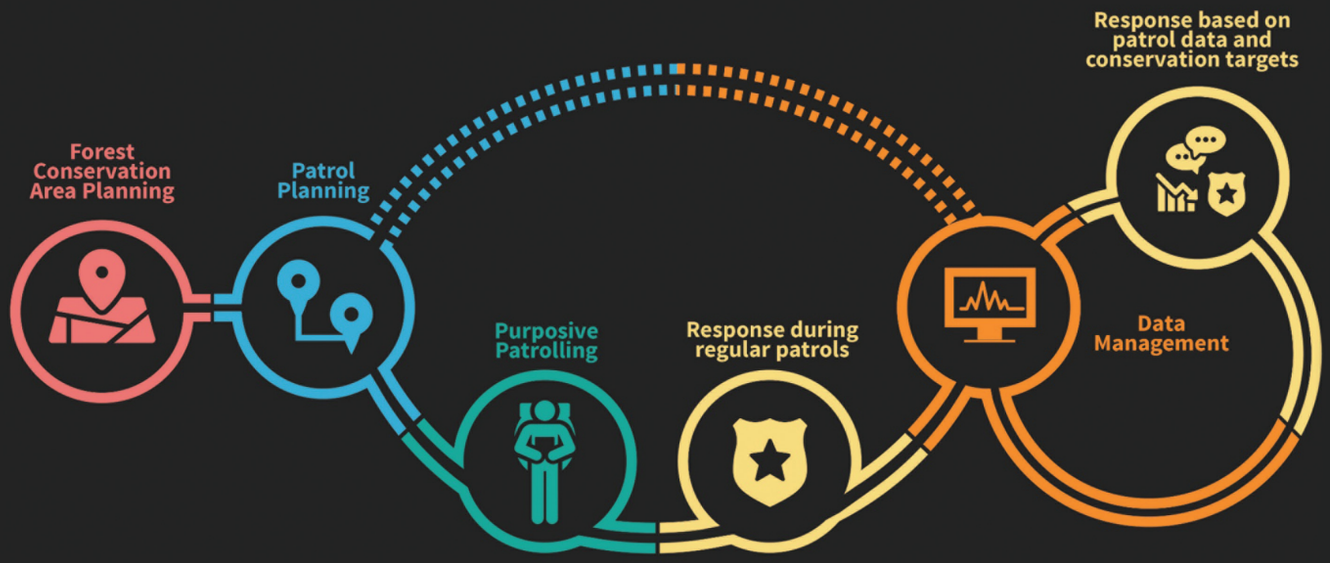
Lawin was piloted in 2014 at the seven original B+WISER program sites with a natural forest cover of around 380,000 hectares. In 2015, the system produced its first results in threat reduction. The practicality and simplicity of a system that incorporates a science-based approach, innovative use of open-source technologies, and partnerships for more effective implementation and response, convinced the Department of Environmental and Natural Resources (DENR) in 2016 to make Lawin an integral part of the national forest and biodiversity protection strategy. DENR equipped and trained personnel throughout the country, allocated financial resources, and issued a policy to roll out the system nationwide, covering all of the 6.8 million hectares of the country's natural forests.

How it works

Lawin starts with a forest conservation area plan that describes the current condition based on forest cover change analysis. The system outlines a desired future forest condition and enumerates measurable conservation targets to realize it. Patrolling areas of importance, forest protection officers and community volunteers record, deter, and address threats to meet conservation targets. Patrollers use open-source software to record their observations and analyze and aggregate data to provide forest managers with the information needed to implement forest protection measures. Response protocols guide forest protection officers to implement actions that include education, alternative livelihoods, and environmental law enforcement, aiming to reduce threats to the forest to improve conditions over time and strengthen habitats for endangered species.

Lawin enables various members of society, including local communities, to collaborate in achieving their common goals to protect life on land and combat climate change. Stakeholder involvement in Lawin's development led to its broad acceptance by the Philippine government, schools and universities, and indigenous people living in the forests. These stakeholders participate in the system's implementation, viewing it as a way to turn around the country's forest and biodiversity conditions.

The Lawin System



Lawin implementation scale

Implemented in all 16 DENR regions — 16

Covers 166 forest conservation areas — 166

Involves more than 3,000 forest patrollers — 3,000+

Works with more than 350 data managers — 350+

Has recorded more than 175,000 kilometers of patrols — 175K+

Stored more than 100 gigabytes of patrol data — 100+

Miliarete "Milet" Buisan-Panaligan, the sole women Community Environment and Natural Resources Officer of DENR in Region 4A discusses with forest patrollers the forest conservation area plan and patrol plan of CENRO Real in the province of Quezon.

Science-based planning

To determine high conservation value areas (HCVAs) in the forest, B+WISER applied science-based approaches, carrying out ecological modelling, forest cover change analysis, and forest threats assessment. This served to help the program better understand the forest condition, ecological values, and deforestation drivers, focusing interventions where they matter most.

B+WISER promoted the inclusion of HCVAs, including sites sacred to indigenous peoples, along with measurable conservation targets, as enhancements to natural resource management planning. As a result, the program helped to enhance protected area management plans in the seven original program sites by integrating the HCVAs identified in the ecological assessments. Some local government units (LGUs) included HCVAs in their local land use plans. Identifying HCVAs enabled the DENR and other stakeholders to focus on protecting areas that need conservation the most because of their levels of biodiversity and ecosystem services.

Maps and spatial information serve as important tools for forest conservation area planning, forest change analysis, patrolling, and measuring forest protection effectiveness. To define HCVAs, B+WISER applied a free and open-source GIS-based platform that provided spatial analysis for key parameters such as climatic conditions, forest conditions, elevation data, and georeferenced species occurrences.

The DENR used forest cover change analysis and the process for identifying HCVAs and defining measurable conservation targets for the nationwide development of forest conservation area plans, which cover more than six million hectares of the country's remaining natural forest. **At the end of the program, all 166 DENR field offices in 16 regions had a forest conservation area plan with measurable conservation targets and outlined interventions to achieve them.**

Mila Portaje (left most), data manager, of CENRO Barotac Nuevo in the province of Iloilo, Region 6, leads a team of forest patrollers inside the Bulabog Putian National Park, one of the protected areas in the province. The Lawin system is also implemented in protected areas to conserve forest and the biodiversity within these areas.

Purpose-driven patrolling

Lawin promotes regular patrols in the forest conservation area to address threats with accurately recorded observations. Patrols are planned based on the forest conservation area plan and conducted by skilled patrol teams, often including both government staff and community members, to achieve conservation objectives and targets.

Before conducting patrols, teams strategize and prepare a patrol framework and plan, detailing how and when to implement patrols in sectors within forest conservation areas. The patrol framework and plan serve as the basis for annual fund allocation and staff mobilization, providing important input for the formulation of a City Environment and Natural Resources Office (CENRO) work and financial plan. Patrol teams consist of four members, including the patrol leader, recorder, spotter, and guide, each with specific roles and responsibilities. In the Lawin system, patrollers record their observations about forest conditions and forest threats using open-source software installed in either a smartphone or tablet.

Data management

Data management entails transferring, syncing, and analyzing patrol data. Proper data management ensures up-to-date information on threats and forest conditions, enabling DENR to perform data-driven decision-making at all levels as it implements forest protection strategies and measures their effectiveness.

B+WISER configured the open-source Spatial Monitoring and Reporting Tool (SMART) to ensure data analysis at all levels for decision-making. The Philippines became the largest user of SMART worldwide when it adopted Lawin nationally. Data managers conduct analysis through statistical and spatial queries. At the local level, data managers analyze patrol data that patrollers collect. This analysis informs strategies to address observed threats, monitor performance, and assess intervention effectiveness. Once patrollers upload data to the system, DENR managers nationally can simultaneously access this data through SMART Connect, a web-based platform that aggregates data centrally, allowing officials to perform similar analyses using data from local offices under their jurisdiction, and take immediate action on issues such as illegal logging.

Responding to threats

Forest conditions improve only with the elimination or reduction of threats. This principle underlies the Lawin system. A response refers to actions taken that directly reduce or eliminate threats. Competent forest patrollers and DENR staff carry out the responses with various stakeholders during regular patrols and after patrol data analysis.

These responses mainly involve law enforcement through apprehension, filing of cases, or conduct of administrative proceedings and awareness-raising activities such as community discussions and information drives on forestry laws conducted by DENR in partnership with LGUs and NGOs. When a response is taken after patrol data analysis, it may draw on a broader set of actions that includes policy formulation as well as project development and implementation, offering opportunities to wean people off livelihoods destructive to the forest.

Responses primarily take place at the local level, where destructive activities occur in forest conservation areas. In many cases, responses take people's needs into consideration, going beyond forest conservation areas to address the root causes of forest degradation and deforestation. DENR's various programs, such as the National Greening Program, provide local officials with the means to cater to these needs and implement people-oriented

Capacity Development

B+WISER developed local capacity by working with institutions and actors with the mandate to implement Lawin. The capacity development effort was comprehensive, starting with Lawin piloting, expanding to national coverage, and finally leading to an institutional development plan guiding DENR's efforts in the long term. The effort included senior leadership in Manila, and staff and patrollers at regional and local levels, including community members. It entailed establishing a new management unit in DENR for Lawin and identifying and building capacity for all job functions needed to support the national project. These functions included patrol team members, data managers, law enforcers, resource managers, legal staff, and planning and budgeting officers across 166 local, 80 provincial, and 16 regional offices, along with units at the DENR central office.

B+WISER's approach to capacity development avoided duplicating existing systems and processes within the DENR. As Lawin was jointly developed with the agency, their own staff became resources during training activities and coaches during field demonstrations. Field personnel who were trained and coached in turn coached their colleagues. DENR included the costs of implementation for the capacity building plan in their budget, which enabled DENR field offices to access equipment and organize training and coaching activities.

Blessie Mabilangan (left), B+WISER technical staff coaches women community forest patrollers in the municipality of Del Carmen in the island of Siargao in the province of Surigao del Norte in Region 13 in using the CyberTracker app in forest patrolling.

B+WISER trained more than 5,000 DENR field personnel, NGO workers, LGU staff, indigenous community members, and private sector groups, which now possess the required knowledge and skills to effectively protect the forests with planning, environmental law enforcement, technology use, and conservation financing. These trainees will help sustain the implementation of innovative practices beyond the life of the program.

Sustainability

To further institutionalize Lawin within DENR, the agency established a dedicated Lawin unit to oversee implementation at the national level. This unit is composed of technical staff that serve to ensure high-quality data and data analysis and provide field offices with technical support. The agency also designated Lawin points of contact in all regions to coordinate Lawin activities. In March 2016, DENR's Forest Management Bureau (FMB) and Biodiversity Management Bureau (BMB) signed a Joint Technical Bulletin, titled "Enhancing Forest Protection through Application of the Lawin Forest and Biodiversity Protection System." This policy document paved the way for capacity development activities and the use of government funds ($40 million [PhP 2.1 billion] from 2016 to 2018) to equip DENR's field personnel for Lawin's implementation. On October 3, 2018, DENR approved a Department Administrative Order adopting Lawin as the national strategy for forest and biodiversity protection — an action that will ensure long term budget allocation for Lawin's implementation. A variety of other financing solutions have also come on line to fund Lawin work in local settings.

Brian Lachica (center), the Lawin National Team Leader and two staff of the Forest Management Bureau of DENR looks at the Lawin dashboard at the Lawin Unit Office.

Securing Local Funding for Forest and Biodiversity Conservation

B+WISER contributed significantly to securing sustainable financing for forest and biodiversity conservation across the country. Through partnerships and strategic alliances with private and public sectors, including LGUs, and civil society organizations, the program broadened options to finance forest and biodiversity conservation at the local level. As a result, the program was able to leverage $600,000 (PhP 32 million) of funds from public and private sources, which complemented DENR-allocated funds for forest protection.

B+WISER also promoted community-based partnerships to mobilize local people, including members of indigenous groups, in forest restoration and protection activities. This intervention helped improve the economic well-being of and environmental conditions for 29,900 people in poor communities who have largely depended on natural resources for their livelihood and income. The success of these partnerships demonstrates how B+WISER contributed to the Philippine government's efforts to address multiple challenges in poverty alleviation, peace-building, and environmental conservation.

User Fees

LGUs can increase budgets for forest and biodiversity conservation by either generating additional or retaining own-sourced revenues. Towards this end, the program worked with various protected area management boards (PAMBs) in developing comprehensive user fee systems to generate revenues. This enhanced system is now applied in Northern Negros Natural Park, Mount Kanlaon Natural Park, Mount Apo Natural Park, and Fuyot Springs National Park (adjacent to the Northern Sierra Madre Natural Park), enabling these protected areas to generate more than USD 20,000 (PhP 1 million) of additional revenues to fund conservation activities. B+WISER also supported a common trekking policy among LGUs covering Mount Apo Natural Park, a designated Association of Southeast Asian Nations (ASEAN) Heritage Park in the Philippines. This policy improved the system for trekking; increased income from mountaineering activities; and enhanced welfare equity for porters, guides, indigenous local communities, and other stakeholders. At the national level, the program supported efforts to increase the local retention of protected area revenues from 25 to 75 percent by participating in initiatives to implement the law pertaining to local retention of protected area revenues; it also helped educate and train management staff in establishing mechanisms needed to retain and apply funds.

Payment for Ecosystem Services

Payments for ecosystem services (PES) occur when a beneficiary or user of an ecosystem service makes a direct or indirect payment to whoever preserves or maintains an ecosystem service. With B+WISER support, Bago City in northern Negros, established a highly effective PES scheme, which served as a model for other interested local governments. B+WISER supported a local ordinance that set up the framework for implementation. The PES initiative pioneers a system to receive payments from stakeholders such as farming communities (e.g., rice and sugarcane planters), industries and commercial establishments, resorts, and households to protect environmental assets through maintaining the health of forests and watersheds. A local trust fund administers and disperses payments to local beneficiaries engaged in forest and watershed protection. For it's over a year and a half of implementation, the PES transaction achieved around 3 million Philippine pesos (PHP) in contributions, which were then allocated to enhance conservation programs, including Lawin-based forest protection and livelihood projects for forest communities. With its success, the DENR worked with B+WISER to replicate the same initiative in Bataan province.

A women farmer in Bago City prepares branches of 'madre de cacao' (Gliricidia sepium) trees to produce 'green charcoal.' Bago City established a 100-hectare woodlot outside the natural forests so that people in the area do not source their wood materials for making charcoal from the natural forest of Mt Kanlaon Natural Park.

Solomon Peckley, a member of the Kankana-ey tribe, and a former combatant, takes a photo of a threat during a patrol in CENRO Sabangan. DENR entered into a partnership with the Office of Presidential Advisor on the Peace Process to mobilize more than 500 former combatants in Lawin patrols in the Cordillera Administrative Region, Northern Philippines.

Partnerships with the Private Sector

B+WISER also worked on other models for private sector participation in forest and biodiversity conservation. The program partnered with the Energy Development Corporation (EDC) and the National Power Corporation to adopt Lawin in their respective work to manage and maintain a total of 230,000 hectares of forests necessary for generating electricity from hydropower plants. This partnership helped leverage a total investment of $ 1.2 million (PhP 66 million) from 2016 through 2018. EDC also invested in a feasibility study that focused on applying international certification standards to help develop a high-value conservation project to protect forests with gains in tradable carbon assets. The study showed that the revenue from trading carbon credits could then support the sustainable implementation of conservation activities, benefiting the climate, biodiversity, and communities.

In a related action to promote climate benefits, B+WISER worked with DENR to support Holcim Philippines, a company engaged in cement production to pilot the Carbon Accounting, Verification and Certification System (CAVCS). The system aims to encourage more private sector investments in forest conservation and reforestation and help increase carbons stocks and reduce carbon emissions.

Policy and Governance

B+WISER supported the DENR and LGUs to create policies that integrated sustainable natural resources management best practices into their regular processes. The program worked with 10 PAMBs to assess their effectiveness in managing protected areas as well as with 31 LGUs to evaluate the state of their environmental governance. LGUs and PAMBs used the results of these baseline assessments to plan and implement activities to address identified gaps. Repeat assessments conducted on these LGUs and PAMBs after two years showed improvements in the assessment scores, which meant that these LGUs were allocating more resources for forest protection, setting up structures to implement resource management plans, and working with the government and other groups to protect forests.

The program also trained more than 500 protected-area personnel, community volunteers, and LGU staff in environmental law enforcement in 10 protected areas. In coordination with the U.S. Justice Department's International Crime Investigation Training Assistance Program, B+WISER spearheaded developing an environmental crime investigation course. In collaboration with another USAID project, the program trained government personnel responsible for cases involving illegal forest products, including timber and wildlife, which violators transport through river, coastal, and marine areas. Upon the BMB's request, the program prepared a handbook on environmental law enforcement in protected areas, outlining standard procedures and protocols relevant to enforcing environmental laws across the country's 240 protected areas. The BMB published this handbook in 2017.

The program also helped an indigenous peoples' group in a protected area in Mindanao document its traditional management practices. The results highlighted five basic tenets to ensure the proper, respectful, and inclusive management and conservation of the park's natural resources. These tenets included the identification of culturally significant areas, tribal policies on resource use, rules for entry to sacred sites, customary practice of justice, and respect for indigenous spirituality. The PAMB later incorporated these into the park's management plan.

Local governments and agencies require approved written policies in order to implement a program, collect revenues, or allocate and use financial resources. At the local level, B+WISER helped LGUs and PAMBs formulate ordinances on collection of payments for ecosystem services provided by forests and protected areas. The program also helped local DENR offices form partnership agreements with LGUs in forest protection. In Mindanao, the program worked with six LGUs in framing a common trekking policy for Mount Apo that standardized fees and procedures for trekkers at the country's highest peak.

San Guillermo Mayor Marilou Sanches (center in white) and CENRO Forester Artemio Gavino Jr (second from left) of CENRO Cauyan sign a Memorandum of Agreement for the protection of over 12,600 hectares of natural forest in the province of Isabela in Region 2.

Inclusion

B+WISER promoted increased participation and recognition of the vital roles that youth, women, and indigenous groups play in forest and biodiversity protection. Twenty-four percent of the forest patrollers, data managers, and resource managers trained by the program are women.

Women

Among them is Helen Amistad of the Dumagat tribe in Cagayan Valley. An active Lawin patroller and member of the Northern Sierra Madre Natural Park's PAMB, Ms. Amistad spearheaded the establishment of a native forest nursery to support forest restoration in Tumauini Watershed Forest Reserve. Diwani Loquia, also an active Lawin patroller and member of Mount Masaraga's PAMB, represents the municipal government of Oas, Albay. Nicknamed the "Tiger Woman of Masaraga," Ms. Loquia is known for her active role in the fight to stop treasure-hunting activities.

The program stimulated an increase in female participation in forest protection activities, which became especially evident in southern Luzon and northeastern Mindanao. In the last quarters of the program's implementation, data showed that southern Luzon's female patrollers recorded the most distance covered during Lawin patrols. Northeastern Mindanao reported more female patrollers than men, with housewives opting to join forest protection activities while their husbands work other jobs.

Indigenous Peoples

Indigenous peoples (IP) also play a central role in the program and DENR's efforts to mobilize as many people as possible to protect the country's last remaining forests. Indigenous peoples living in or near protected areas possess local knowledge, making them ideal leaders in forest protection. The program worked with numerous indigenous communities, including the Dumagat Tribe in northern Luzon, the Mangyans of southern Luzon, and Talaandig, Higaonon and Manobo tribes of Mount Kitanglad in northern Mindanao. B+WISER facilitated partnerships between indigenous groups and local governments. These partnerships trained indigenous community members as Lawin patrollers, enabling them to work with government rangers to monitor the forest and threats. The program also conducted information, education, and communication campaigns to give indigenous peoples a voice and help them better appreciate both the importance of forest protection and their vital role in it.

'The Wisdom Keepers of Mt. Kitanglad'

For the Talaandig, Bukidnon, and Higaonon tribes of Mount Kitanglad, the mountain is not just their home; it is the stronghold of their faith, and provides for their physical and cultural survival. These tribes regard the mountain as sacred, and protecting it as a sacred responsibility. With their local knowledge and determination to preserve the mountain's sanctity, Kitanglad tribes, together with other volunteers, led the protection of Mount Kitanglad Range Natural Park as Kitanglad Guard Volunteers. To date, roughly 380 volunteers serve on more than 50 patrol teams, covering about 45,000 hectares of forest.

Traditionally, indigenous peoples passed on their norms and practices orally from one generation to the next. A forward-thinking tribal chieftain, Datu Makapukaw Adolino Saway, believed that documenting tribal customs and traditions would best preserve them as an inheritance for future leaders. With this in mind, the program helped tribal leaders create the first-ever written record of customs, traditions, and practices related to natural resource management of the three tribes residing on Mount Kitanglad.

Indigenous tribes long thought that preserving their traditions in written form and sharing them with outsiders would anger the nature-spirits. The book, "The Wisdom Keepers of Mt. Kitanglad," broke through that belief and helped to map cultural HCVAs with modern technology. B+WISER had already identified Mount Kitanglad's areas of high conservation value based on species diversity, ecosystem services, and habitats. Mapping areas with high conservation value stemming from cultural importance, such as sacred sites, complemented B+WISER's work, allowing for a more holistic approach to patrolling and conservation of this important ASEAN Heritage Park.

Bae Inatlawan, a woman leader of the Bukidnon tribe, discusses the importance of preserving traditional practices in protection within their ancestral domain that overlaps with the Mount Kitanglad Natural Park in the province of Bukidnon in Region 10.

Restoration and Resilience

B+WISER launched a series of interventions that combined restoration of degraded habitats with resilience planning for future shocks. The program promoted the forest landscape restoration approach, which aims to restore ecosystem functions for forests, including mangroves, and prioritized these functions based on site-specific conditions. For instance, many areas were prioritized to restore habitats for endemic and endangered species. Other areas were also restored to reduce vulnerability of forest communities and human settlements to erosion, landslides, typhoons. Through grants and technical assistance, the program supported two groups — one in Negros and another in Isabela — actively restoring 150 hectares of degraded forestlands. These sites established best practices from planning to actual restoration activities, applying appropriate management interventions to reforest the areas and monitor progress.

B+WISER identified areas for forest restoration through protection with assessments and land cover information. As the entry point, the program used maps showing changes in forest cover between 2003 and 2010. More recently, the program prioritized deforested and degraded forest areas for restoration. Among the identified areas, those located in or within the vicinities of HCVAs proved the most important in restoring the forest's habitat function for endemic and endangered forest-dependent species. The program promoted the concept of passive restoration for degraded forest areas by focusing forest protection initiatives on these areas, particularly through Lawin. The program supported passive restoration through improved protection of 700,000 hectares of degraded forest.

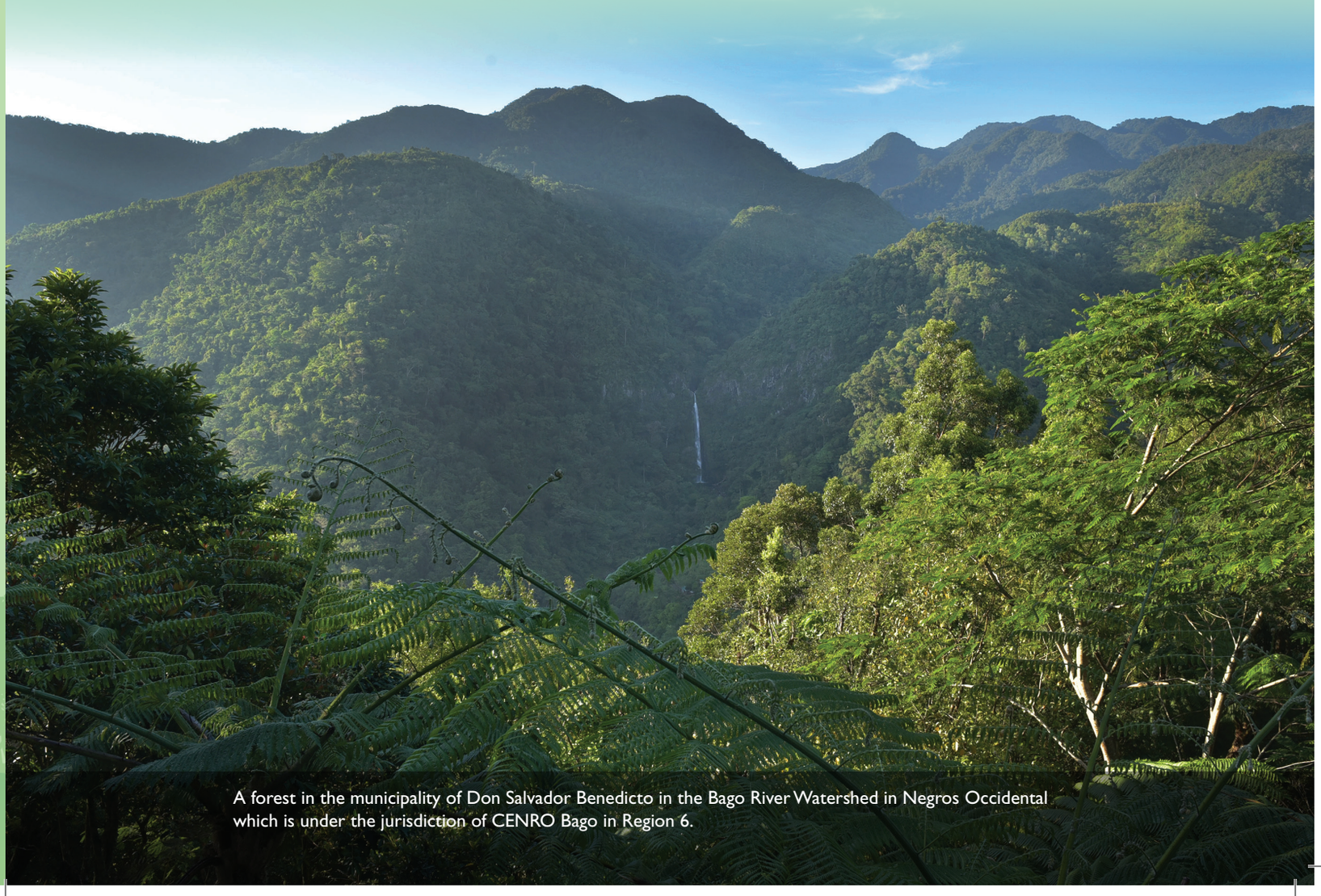
Other key areas for forest restoration included those significant to increasing community resilience. For upland areas, B+WISER conducted climate vulnerability assessments to identify areas prone to landslides and flooding, which have high value for soil and water conservation. To restore the forest ecosystem, B+WISER prioritized deforested or degraded forest areas on steep slopes prone to erosion. Program staff referenced results from the assessments to form development plans for LGUs and relevant government agencies. The results also served as a key resource for updating protected-area plans and conducting multi-stakeholder meetings in Quinali, Bago, Mount Kitanglad, and Sierra Madre, highlighting the importance of forests in the health of a watershed and the ways in which various private sector groups can contribute to its conservation. Program staff also used these results as inputs to prepare eight LGUs to submit proposals to the People's Survival Fund, the Philippine government's 1 billion PHP funding mechanism for climate change adaptation initiatives. In collaboration with the U.S. Forest Service, B+WISER improved capacity of stakeholders in vulnerable areas on riverbank restoration and stabilization applying bioengineering techniques. The LGUs applied these techniques along the riverbanks of the Quinali Watershed, protecting communities along the rivers from losing their land as a result of soil erosion.

In 2013, in the aftermath of the massive destruction from Typhoon Haiyan, B+WISER responded to a government request to conduct a rapid damage assessment and come up with recommendations. The assessment report helped catalyze the allocation of 1 billion PHP for the Mangrove and Beach Forest Development Program implemented in 2015. B+WISER led the development of a technical bulletin on beach forest establishment and management that served as one of the guides in the program's implementation. This implementation covered a total of 50,000 hectares of coastal and beach areas. Aside from serving as a habitat for many species, mangroves and beach forests provide food, fuel, and sources of medicine, and protect human settlements near coastal and beach areas from storms.

National Forest Monitoring System

B+WISER facilitated the U.S. Forest Service's (USFS) technical support for DENR, mainly by building FMB capacity in the design and implementation of a National Forest Monitoring System. More than twenty technical staff of FMB, National Mapping and Resource Inventory Authority (NAMRIA), and University of the Philippines Phil-LIDAR have been trained by the USFS through a series of workshops. FMB is now better equipped in developing the monitoring system to meet its national and international forest monitoring needs with both ground inventory and remotely sensed data. It includes a measurement, reporting, and verification (MRV) system to comply with forest carbon-reporting policies and the development of a baseline national forest reference emission level. This system will also serve other forest management and monitoring needs and priorities, including the National Greening Program.

An effective and functioning National Forest Monitoring System will ensure that the Philippine government is ready to receive results-based funding under mechanisms to reduce emissions from deforestation and forest degradation (REDD+). The U.S. Forest Service conducted training sessions that included data analysis for forest resource assessment, biomass estimation, and the measurement of carbon stock in forests with the Full Lands Integration Tool. In 2018, B+WISER coordinated a U.S. Forest Service-led training held at the University of Maryland's Global Land Cover Facility to produce Philippines-specific forest cover datasets using the Phil-Lidar data for calibration.



A forest in the municipality of Don Salvador Benedicto in the Bago River Watershed in Negros Occidental which is under the jurisdiction of CENRO Bago in Region 6.

B+WISER is a USAID-funded project implemented by Chemonics International, Inc.

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