NEGOTIATING WITH THE SPIRITS

Recognizing the Conservation Values of Indigenous Knowledge Systems and Practices of the Agusanon Manobo, Agusan del Sur, Philippines

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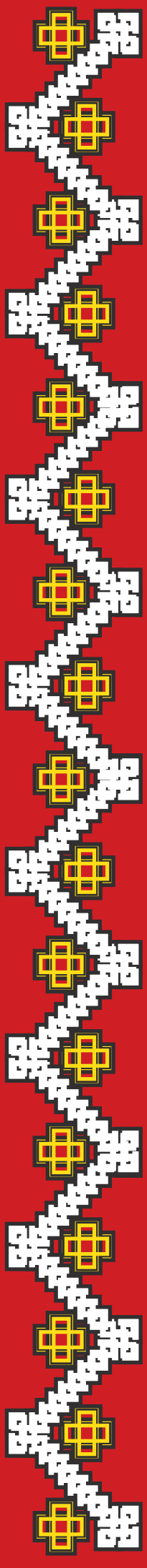

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Abstract

This research contributes to recognizing and promoting the knowledge systems and practices of the Agusanon Manobos in conserving the biodiversity of the Agusan Marsh. The Manobos' view of life, land and water, emanate from the relationship they have with nature and the spirits. This relationship, characterized by the values of respect and reciprocity, shape the Manobos' economic reasoning and behavior. The paper focuses on the Manobos' practices, in terms of maintaining species' population, diversity, and living conditions in the AMWS and can be categorized into geographic and temporary protection regulations.

Introduction

The use of natural resources is restricted by Manobo beliefs, the ancestors are guardians of the forest and sanctions are enforced by the spirits. These knowledge system and practices provide the framework for conserving valuable natural resources and biodiversity.

This paper sought to prove the hypothesis that the practices of the Manobos, a group of Indigenous Peoples (IP) living in the Agusan Marsh Wildlife Sanctuary (AMWS), which are based on their knowledge and belief systems, are not harmful to biodiversity. They even contribute to its conservation.

After describing the methodology used (Chapter II) for this study and introducing the Agusan Marsh (Chapter III), a general overview of the Manobo belief system and their relationship with the physical environment is discussed in Chapter IV. Both the economic and spiritual reasoning behind each practice are highlighted and embedded in the Manobos' general concept of life, land, water, and the environment.

The practices and their contribution to maintaining the population, diversity, and living conditions of species in the AMWS have been categorized as follows:

- Regulation of the entry to certain sites;
- Protection of species in vulnerable life stages;
- Promotion of diversity and fallow periods for regeneration in livelihood activities; and,
- Protection of specific species.

These categories are embedded in the discussion of the Manobo belief system and linked to its environmental impact. Whenever possible, examples—supported with facts and figures—are also provided for more detailed descriptions.

[1]According to the Indigenous Peoples' Rights Act of 1997, Indigenous Peoples or Indigenous Cultural Communities are "group of people or homogenous societies who have continuously lived as organized community on communally bounded and defined territory". They also have, "under claims of ownership since time immemorial, occupied, possessed and utilized such territories, sharing common bonds of language, customs, traditions and other distinctive cultural traits, or who have, through resistance to political, social and cultural inroads of colonization, non-indigenous religions and cultures, became historically differentiated from the majority of Filipinos".

Methodology

In post-normal science, it is argued that non-scientists – in this case, IPs who have traditional ownership over natural areas - who can contribute to and are willing to engage in scientific dialogues should become involved in the problem indication and solving processes[2].

The research brought together the fundamentally different logics and philosophies of indigenous resource use and natural resource management by focusing on cultural capital, i.e. the Manobo's system of knowledge, beliefs, and practices, which has evolved and adapted to a dynamic environment while contributing to the conservation of the same. In doing so, the three-year process (from 2013-2016) used the scientific framework of Participatory Action Research (PAR) and aimed at providing the venue for mutual understanding and learning.

Despite international conventions, such as the Convention of Biological Diversity[3] recognizing the importance of integrating local communities and specifically the indigenous peoples in the conservation and use of biodiversity, little experience and methodological guidance made reflection loops throughout the process particularly relevant. Bridging indigenous and scientific worldviews was a challenge, making adjustments in the course of the documentation process a precondition for success.

[2] Francis, R.A. and Goodman, M.K. (2010): Post-normal science and the art of nature conservation. In: Journal for Nature Conservation Volume 18, Issue

[3] Specifically in Aichi Target 18: By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.

The Agusan Marsh

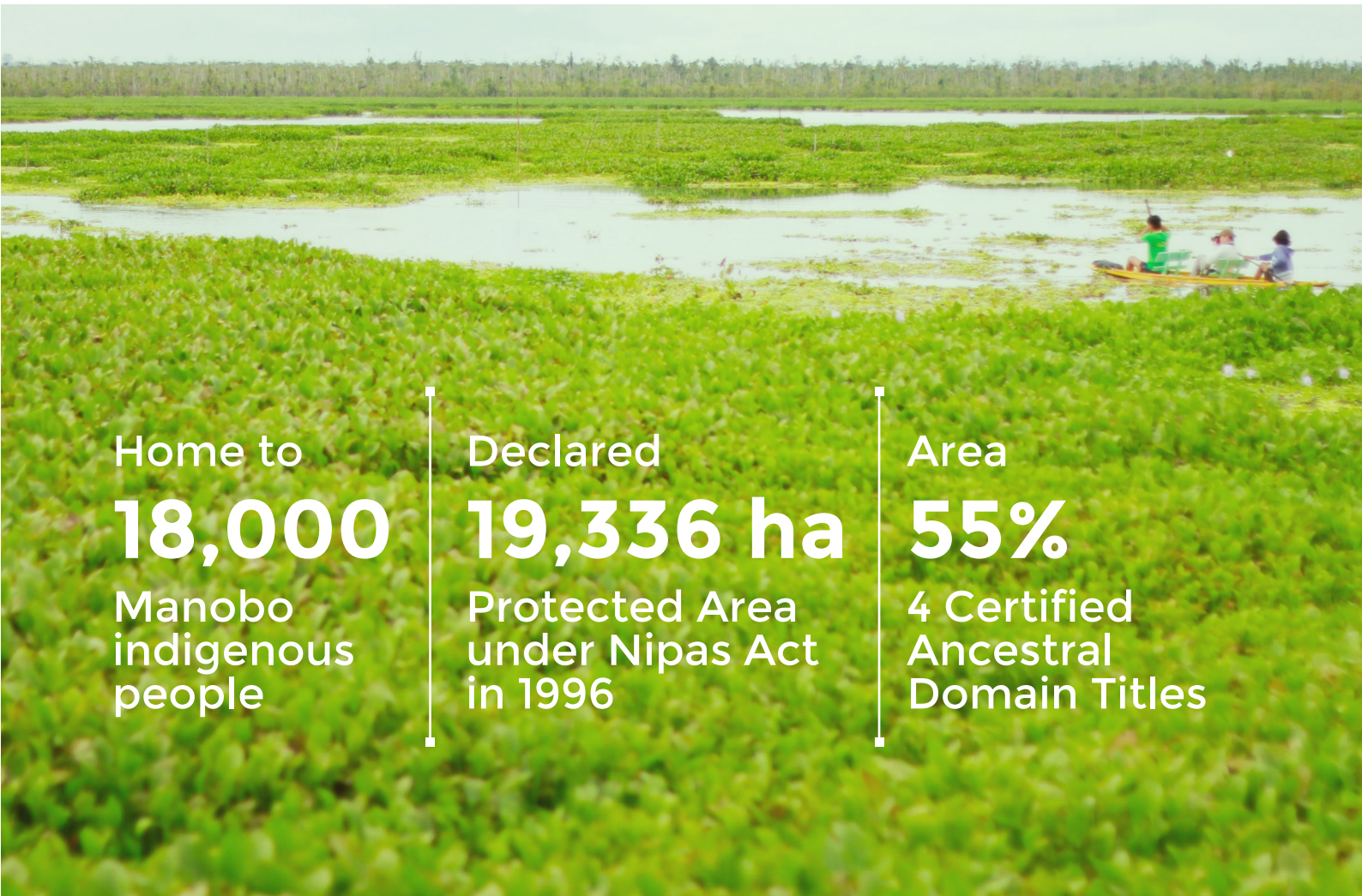
Agusan, which means 'where the river flows,' has given name to the Agusan Marsh, a natural freshwater wetland in Northeastern Mindanao in the Philippines.

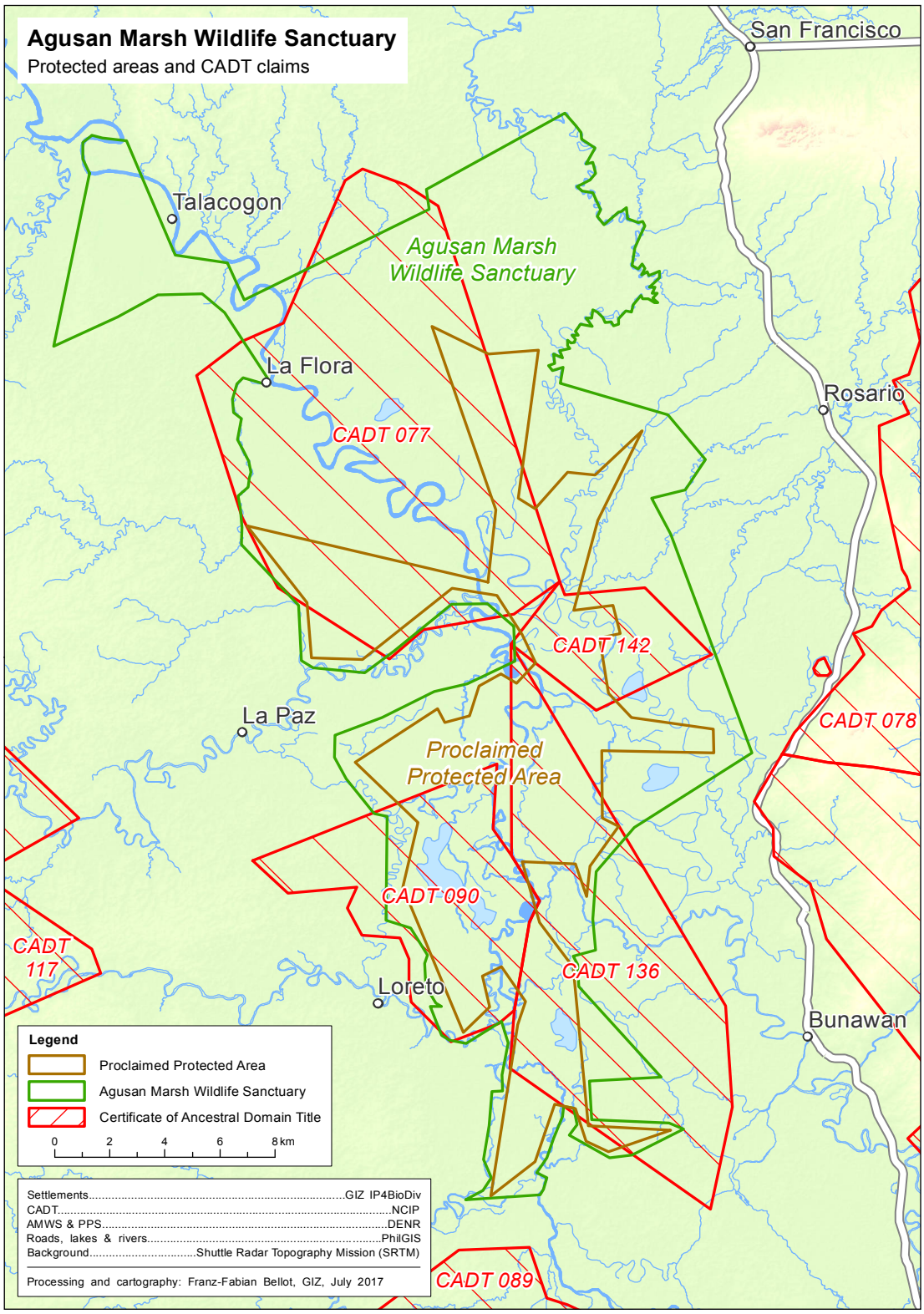
Seven major habitat types covering 19,336 hectares have been declared a wildlife sanctuary under the National Integrated Protected Areas System (NIPAS) Act of 1992.[4] It was also certified by the Ramsar Convention as one of the most important wetlands nationally and internationally.

The AMWS is the largest marshland in Asia and plays an important ecological role in the Caraga Region being the catch basin of the Davao-Agusan plains in eastern Mindanao. It includes a complex network of marshes, rivers, lakes, and ponds situated at the Greater Mindanao Biogeographic Region.

Besides its ecological importance, the Agusan Marsh, locally known as Danao, is home to approximately 18,000 Manobos, who make up 70% of the Marsh's population. It covers six municipalities and 38 barangays. Four Certified Ancestral Domain Titles (CADT) cover 55% of this area. One other claim is currently being processed.

[4] Official Gazette of the Republic of the Philippines (1992): Republic Act No. 7586. National Integrated Protected Areas System (NIPAS). The NIPAS Act or Republic Act 7586 has provided the legal framework for the establishment and management of protected areas in the Philippines.




Agusan Marsh Wildlife Sanctuary
Protected areas and CADT claims
San Francisco
Talacogon
Agusan Marsh Wildlife Sanctuary
La Flora
Rosario
CADT 077
CADT 142
CADT 078
La Paz
Proclaimed Protected Area
CADT 090
CADT 117
CADT 136
Loreto
Bunawan
CADT 089
Legend
Proclaimed Protected Area
Agusan Marsh Wildlife Sanctuary
Certificate of Ancestral Domain Title
0 2 4 6 8 km
Settlements.....GIZ IP4BioDiv
CADT.....NCIP
AMWS & PPS.....DENR
Roads, lakes & rivers.....PhilGIS
Background.....Shuttle Radar Topography Mission (SRTM)
Processing and cartography: Franz-Fabian Bellot, GIZ, July 2017

The Manobo Belief System

Manobo and the Land and Water

Depending on the time of the year, the Agusan Marsh consists of either approximately 50 lakes or one big lake with a few scattered islands. Despite these significant morphological changes, the Manobos have been adept in foraging, fishing, and cultivating their ancestral land.

Before the government introduced land classification ownership systems, the Manobos believed that the Magbabaja[5] owns the land. The peoples are only allowed to till and harvest the resources. Nowadays, extended families or kinships 'own' land for subsistence cultivation and fishing. Forests, lakes, burial grounds and other special use areas are kept communal, as a support system for the community. These areas are conserved since damage would cause harm to the whole community.

Forests with high diversity of medicinal plants are always communal since the Manobos believe that medicines are for everybody's use and not to be sold. These areas are protected and kept intact, because the Manobos believe that spirits would render the medicine useless or even harmful to the sick if the medicinal plans die due to human activity.

External pressures throughout history

In the 1940s, 90% of the Agusan Marsh was conserved by the Manobos through regulating systems. In recent history, this system was confronted by several challenges. During the World War II, many of the restricted areas were cleared and used as encampment by both the Japanese and Filipino guerilla forces. Similarly, in the '80s and '90s, forest areas in the Agusan Marsh served as temporary camp or alternative trail for the communist insurgents.

During the logging era, from the '70s to the '90s, the government gave Timber License Agreements and thereby control over forest areas to corporations. This framed the start of a time of deforestation and severe violation to the restricted areas set by the Manobos.

Alongside the challenges caused by conflicts and logging, the constant influx of migrants who acquired lands from the IP leaders and settled in the Agusan Marsh resulted in the introduction of new technologies and practices often challenging the traditional, regulating systems. Also, the burial grounds of the Manobos have become target of treasure hunters in search for gold and other antiques.

Today, the Manobos are confronted by the impact of upstream mining and the introduction of oil palm. The sedimentation of lakes as well as constant flooding are threatening the flora and fauna of the Agusan Marsh.

These challenges have affected the indigenous knowledge systems and practices as well as the landscape and ecosystem, which the Manobos coexisted with. Despite the external pressures, a few – but diminishing — regulated areas remain. This, however, makes it difficult to prove some links between status of the biodiversity and the indigenous practices.

[5] This can be translated to the one who causes everything or the one who owns all.

Conservation in the Manobo Belief System

The Manobos believe that a variety of spirits are responsible for the different aspects of life such as agriculture, land, water and fishes, mountains, thunder/lightning and human beings. According to the Manobos, some people like the baylans[6] have a special spirit watching over them called abyan[7] who guides them with the interpretation of their rituals and the world.

The Manobos believe that everyone can use the available natural resource needed for survival. However, two fundamental concepts regulate resource use, thereby contributing to biodiversity conservation:

1. **Limiting the extraction of resources to the amount the community actually needs, avoids over-harvesting, and unnecessary wastage of resources; and,**
2. **Reciprocity and mutual respect enhance the conservation or sustainable use of the resources.**

Almost all aspects of the Manobo life reflect reciprocity. Sharing is the fundamental basis for Manobo relationships within communities and extends to their interactions with spirits and nature. In daily life, the Manobos observe reciprocity as they go through their livelihood activities. After harvesting, fishing, hunting or gathering, food and medicine are shared with the community. The practice is brought about not only by limitations in storing goods, but more importantly, by the Manobos' belief that the Magbabaja and the spirits care for humans, plants, and animals. Thus, respect and co-existence must be maintained so as not to offend the spirits who, when angered, are believed to punish offenders through lightning strikes or epidemics. This spiritual rationale is reflected in the Manobos' celebrations of their relationship with the environment through rituals in which offerings symbolizing life are made to the spirit.

Also, a variety of activities to replenish nature such as tree planting, caring for young, and conserving the habitats of the species show the Manobos' respect for the environment. This respect, as well as their relationships with the flora and fauna, are reflected in the Manobos' stories, dances, and chants. Dances imitating animals such monkeys, crocodiles, snakes and hawks, show how closely intertwined the peoples are with their nature and the corresponding spirits.

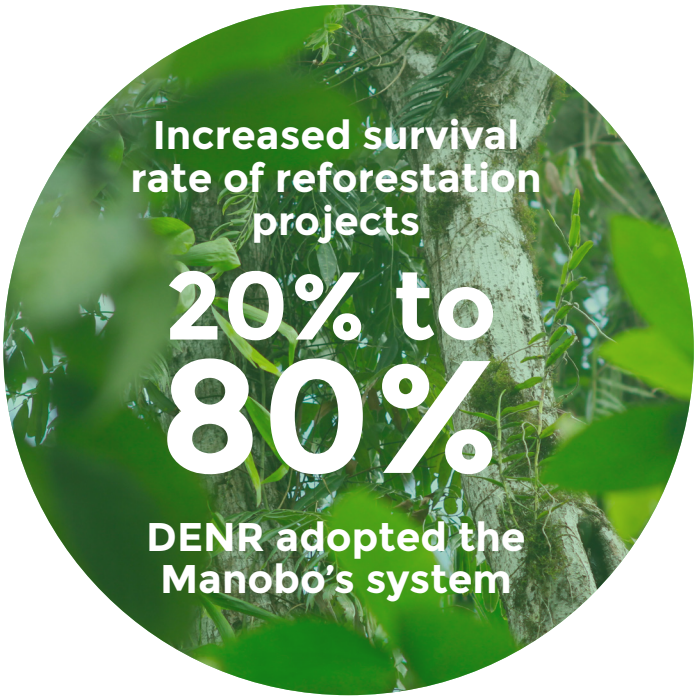
These reciprocal relationships between humans and the environment show that the Manobos play a role in actively cultivating, improving and positively contributing to sustaining ecosystems and conserving biodiversity. In the Agusan Marsh, rice paddies, for example, function as corridors for many frogs and insects and have a high species diversity[8]. Further, a system of reciprocity among communities creates joint responsibility for ecosystem functioning.

[6] A religious leader; Also, babaylan
[7] "spirit familiars". In Buenconsejo (2002) Songs and Gifts at the Frontier: Person and Echange in the Agusan Manobo Possession Ritual, abyans or spirit companions can approach and help human beings. Or guardian spirit
[8] INWEPF (2007): Rice Paddies as Corridors for Conservation of Aquatic Fauna

Assisting Natural Regeneration by the Manobos

Reciprocity is so deeply rooted in their culture that the Manobos are prompted to plant trees in order to replenish what they took from nature. From an economic perspective, this mindset ensures the availability of resources for their own use and for the use of future generations.

Moreover, trees are used to mark lands which the Manobos lay claim on. For example, burial sites of their ancestors are often planted with trees such as the mam-on (Arica Palm). Reforestation is also an integral part of the Manobo's agricultural practices. Trees are planted to fight pests, conserve the soil, or protect crops against flooding.
This explains why the Manobos have efficient ways of planting trees. In fact, the Department of Environment and Natural Resources (DENR) has already adopted the Manobo's system enabling the agency to increase the survival rate of its reforestation projects from 20% to 80% and reduce costs[9].



The traditional tree-planting process starts with the selection of branches from an existing tree. The chosen branch is cut and then soaked in muddy water for it to absorb moisture and nutrients. When the bark starts to bulge, it indicates that roots are about to sprout, which, according to the Manobos, is the best time to plant the tree.

[9] Information from DENR Protected Area Superintendent-AMWS Emmilie Ibonia (2016)

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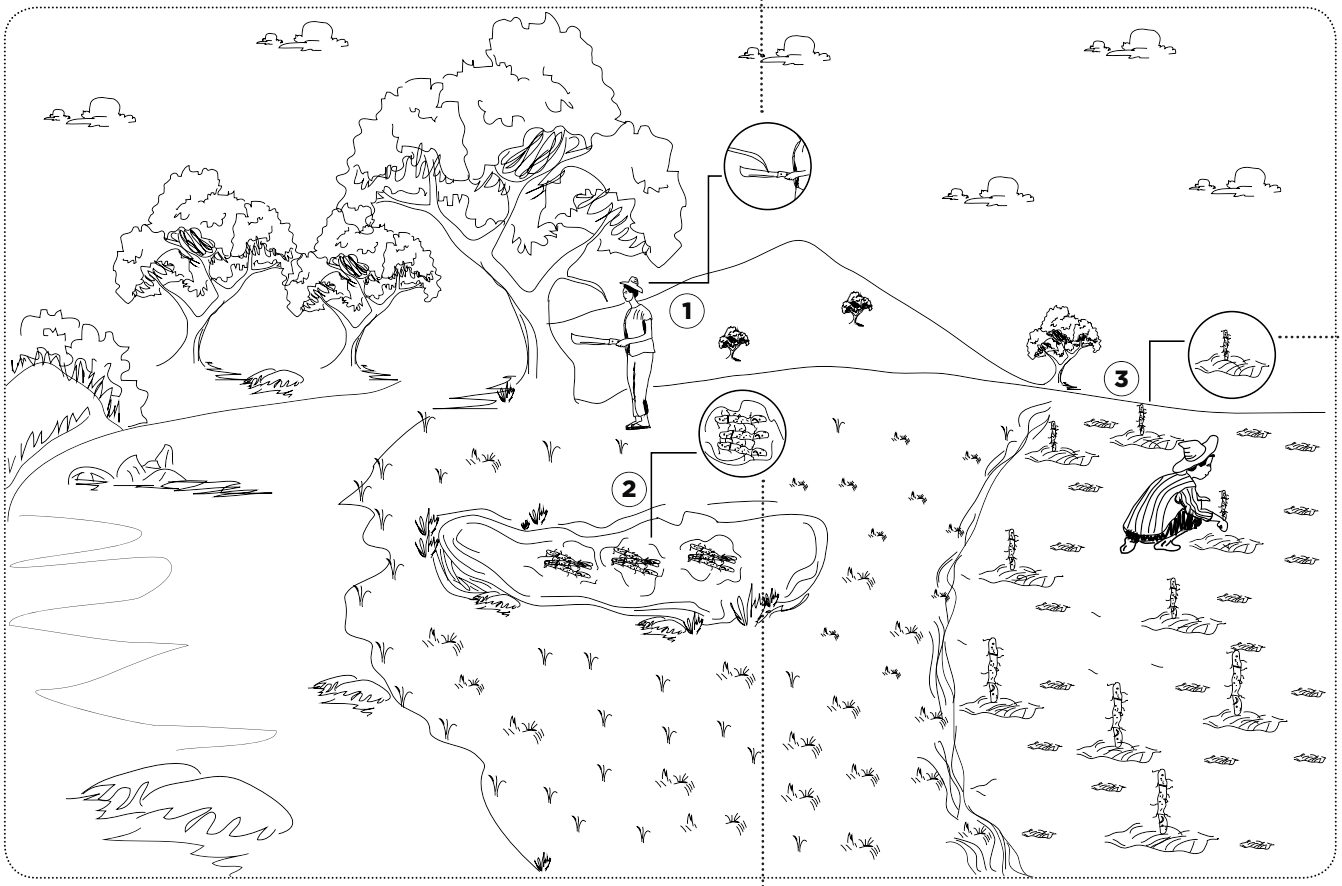

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Regulation of the entry to certain sites

The Manobos have established several mechanisms to regulate the entry to certain sites which are important to them.

Called patagonan, these conserved areas include animal sanctuaries and breeding sites, water sources, and burial grounds. Regulating entry may be for economic or spiritual reasons.

Despite the growing challenges, most of the Ancestral Domains still have large or small patagonans. Some of these are the Lake Kasawangan and its surroundings in Talacogon (about 300 ha.); Lake Benoni, straddling Talacogon and La Paz (approximately 1000ha); Buyod, in between La Paz and Loreto (about 30 ha); and, Tilusan in Loreto (estimated to be 70 hectares of forest and another 50 hectares of second growth).

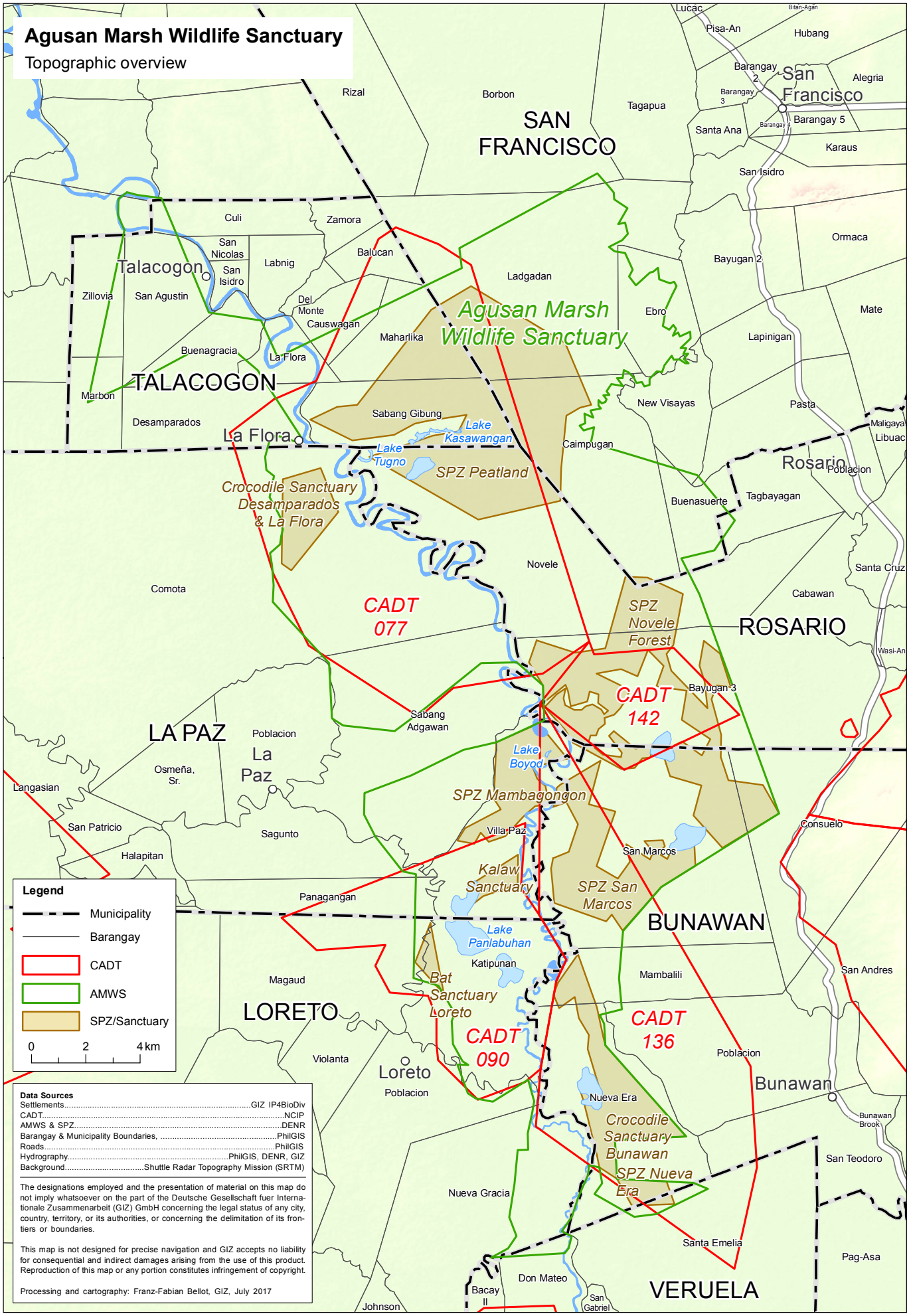
Many of these areas coincide with the Strict Protection Zones declared by the DENR owing to their 'less disturbed' state.

Terrestrial and Aquatic Animal Sanctuaries

Terrestrial animal sanctuaries are retreating areas usually allocated by elders to protect certain species though regulating entry or disallowing activities like hunting and cultivation.

The allocation of the sites is consistent with the natural habitat of the animals. The Manobos believe that spirits would inflict sickness and other bad events to the community if these rules are violated. The following sanctuaries can be found in the Agusan Marsh:

- Kalaw (tarictic) sanctuary
- Bat sanctuary in Caimpungan Forest and Lake Panlabuhan
- Crocodile sanctuaries in La Paz and Bunawan
- Fish sanctuaries in Lake Panlabuhan


Agusan Marsh Wildlife Sanctuary
Topographic overview
Legend
Municipality
Barangay
CADT
AMWS
SPZ/Sanctuary
0 2 4 km
Data Sources
Settlements....GIZ IP4BioDiv
CADT....NCIP
AMWS & SPZ....DENR
Barangay & Municipality Boundaries, ...PhilGIS
Roads....PhilGIS
Hydrography....PhilGIS, DENR, GIZ
Background....Shuttle Radar Topography Mission (SRTM)
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Processing and cartography: Franz-Fabian Bellot, GIZ, July 2017
Agusan Marsh Wildlife Sanctuary
Crocodile Sanctuary Desamparados & La Flora
SPZ Peatland
Lake Kasawangan
Lake Tugno
CADT 077
SPZ Novele Forest
CADT 142
SPZ Mambagongon
Lake Boyod
Kalaw Sanctuary
SPZ San Marcos
Lake Panlabuhan
Bat Sanctuary Loreto
CADT 090
CADT 136
Crocodile Sanctuary Bunawan
SPZ Nueva Era
SAN FRANCISCO
TALACOGON
LA PAZ
LORETO
ROSARIO
BUNAWAN
VERUELA
Talacogon
La Flora
La Paz
Loreto
San Francisco
Rosario
Bunawan
Rizal
Borbon
Tagapua
Santa Ana
Barangay 5
Karaus
San Isidro
Culi
Zamora
San Nicolas
San Isidro
Labnig
Balucan
Ladgadan
Ormaca
Bayugan 2
Zillovia
San Agustin
Del Monte
Causwagan
Maharlika
Ebro
Mate
Lapinigan
Buenagracia
La Flora
Marbon
Desamparados
Sabang Gibung
New Visayas
Pasta
Maligaya
Libuac
Caimpugan
Poblacion
Buenasuerte
Tagbayagan
Novele
Santa Cruz
Comota
Cabawan
Wasi-An
Bayugan 3
Sabang Adgawan
Poblacion
Osmeña, Sr.
Langasian
San Patricio
Halapitan
Sagunto
Villa Paz
San Marcos
Consuelo
Panagangan
Magaud
Katipunan
Mambalili
San Andres
Violanta
Loreto
Poblacion
Nueva Era
Poblacion
Bunawan
Bunawan Brook
San Teodoro
Nueva Gracia
Santa Emelia
Pag-Asa
Don Mateo
Bacay II
San Gabriel
Johnson
Lucac
Pisa-An
Hubang
Barangay 2
Alegria
Barangay 3
Barangay 4
Bitan-Agan

The most common sanctuaries are related to the protection of aquatic life. The Manobos subsist from the lakes system and certain regulations have become part of their life. At present, three types of conservation practices can be found in Agusan Marsh:

1. Areas where access is temporarily restricted

In areas considered breeding grounds (usually larger lakes upstream), fishing is prohibited from February to April when the water levels in the Agusan Marsh are low. This is the time when fish move to deep-water parts of the lake for spawning. Once the water levels rise, the fish have reached a certain size and, by the growing volume of water, are brought to different areas in the Marsh. This is the time when fishing is allowed again. The reason for such a practice is economical. Elders teach their children that it is important not to disturb the fish during breeding season in order to continue having enough in the future.

The Manobos, however, have recently observed changes in the pattern of spawning. Due to increasing external pressures, it has become more difficult to define clear spawning seasons. The areas and the size and age of spawning fish has reduced. The change can be attributed to mining and pesticide contamination. Endosulfan, for example, is known to cause abnormality in the reproductive system of animals and fish. Cyanide also affects their growth. Both of these can be found in the Agusan Marsh.

2. Areas where access is restricted all year round

In the past, the Manobo policies were communicated by the elders via word of mouth. Penalties were induced by the spirits in the form of sickness, lightning or storm. Today, the higher levels of external threats have made written local policies necessary for the indigenous communities to counterbalance the increasing number of introduced practices and modern equipment.

Breeding in Lake Kilubidan (Rosario)

Lake Kilubidan (approx. 300 ha), which contains water the whole year round, is especially protected during breeding season because certain fish breeds such as haluan, gurami, giant gurami, puyo, cabuay, pungok, sihi, and tambilaka spawn in this area. Because of this, the lake is not very disturbed compared to adjacent smaller ones. The surroundings of the lake are dominated by small trees thriving in inundated areas, and water tolerant plants like bangiba. At present, the threat of invasive species like water hyacinth is low since it only survives at the outlet of the lake and is washed out when the water is high. The dense flora around the lake and at its outlet makes access difficult thereby providing an additional protection to the ecosystem.

Based on a 2013 study of the Caraga State University, the aquatic plant and fish diversity in Kilubidan is one of the highest in Agusan Marsh (comparing 12 lakes). The sedimentation rate ranges from 0.4 to 0.45 g/cm2/day- contributing to the murky appearance of its water.

Local Policies for the Loreto Lake Systems

One example is the local policy established by the indigenous communities in Kanimbaylan and Panlabuhan Bukogon Lake systems, where the use of introduced practices and modern equipment, such as motorboats, is prohibited. Violations to this policy would incur payment of a fee and the prohibition of future entry. These restrictions help stabilize the aquatic fauna population size, breeding, and food sources.

3. Areas where water lilies (*takuy*) dominate.

Areas dominated by water lilies are protected all year round due to their function as both shelter for fish or fry and food for fish, birds and humans. The Manobos have high regard for water lilies, as they believe that the takuy serve as food for their ancestors during war times. Disrespect to the takuy -- a plant believed to survive despite difficult conditions -- will cause gaba, which means one will have a difficult life. Spirits only allow harvest of takuy for food during flooding season which corresponds to the lean months and when roots are floating, indicating that the plant is fully grown.

Higher fish populations and diversity can be observed in areas with water lilies. Scientifically, this can be drawn back to the fact that water lilies provide shelter from predators, including humans – as these plants make the use of fishing equipment difficult. Moreover, these areas serve as habitat for detritus and other invertebrates, which is beneficial to local and migratory wildlife, thus increasing the areas' heterogeneity and structural complexity [10]. The better water quality in areas dominated by water lilies results from the fact that vascular aquatic plants have the ability to absorb and accumulate heavy metals, serve as biological filters by removing and improving the contamination of aquatic ecosystems, and stabilize hydrosol.[11]

On the downside, the decrease in phytoplankton can reduce dissolved oxygen (DO) concentrations, negatively affecting the abundance of planktivorous fish.

Different water quality assessments show different levels of DO levels for the Agusan Marsh Wildlife Sanctuary. A study conducted by Mindanao State University (MSU)[12] reported an average DO level of 2-2.5 mg/l for 11 stations. This was under the required levels of 5-6 mg/l for growth and activity of most aquatic organisms.

Meanwhile, a study conducted by the Caraga State University (CSU)[13] in ten lakes showed their levels either within or higher than the recommended.

[10] Curtis ,2009.
[11] Onke and Juvarkar, 1996.
[12] MSU Naawan-Foundation for Science and Technology Development, Inc. (August 2013), unpublished.
[13] CSU Aquatic Plants in Agusan Marsh and their Role (2013), unpublished.

Burial Grounds

Burial grounds are sacred to the Manobos, as these are believed to be inhabited by their ancestors' spirits. Each Manobo community has protected the burial grounds of their ancestors over time.

Old coffins were found in the areas of Sabang Gibong in Talacogon, and Buyod in between La Paz and Loreto, which are protected by the IPs and entry to these sacred burial grounds is prohibited. It has been observed that outsiders have been extracting antiques and other treasures from the area, violating not only the Manobos' regulatory system but also affecting the area's natural ecosystem.

The Burial Grounds of Buyod

Buyod – located between La Paz and Loreto – is one of the primary burial grounds of the Manobos. It has already been protected even before it was declared as such under NIPAS. The island is said to be carved out from the adjacent area (now Kalanitan Lake) by a powerful spirit to serve as sanctuary for the ancestors' spirits as well as for plants and land animals, especially during flooding. The area is said to have never been flooded and the Manobos believe that Buyod even floats a little when the water is too high in order to protect the remains of their ancestors.

The flora and fauna in this area used to be especially abundant and diverse. Buyod is further characterized by its salt water springs which emit inflammable gas and natural ponds bubbling with salty water and fumes, which especially attract birds who drink the special water (sisiman).

However, the desecration of the area by armed treasure hunters has destroyed the pristine and sacred area, leaving the Manobos unable to stop them. Pits dug by these hunters, planks of the broken coffins, and some bone are all that remains. In the digging process, the vegetation was denuded to reach the coffins underneath.

Water Sources

Sources of drinking water all over the Agusan Marsh are protected, due to their importance for the survival of the communities' residents.

Clean water from Little Bokogon

One lake in Loreto, Little Bokogon is protected by the Manobos because it serves as a source of clean water for the community. Similarly, areas around it are kept in their pristine condition by regulating entry. Taking or simply cutting parts of plants around the lake are prohibited. The informants said that there is a natural spring underneath this small lake, making it cleaner than other lakes in the province. This was validated by MSU when it conducted a study of the lake. Water analysis have shown that mercury and other heavy metal levels are relatively lower in Little Bokogon than in other lakes.

Protection of species in vulnerable life stages

In general, harvesting, hunting or fishing of species, in vulnerable life stages is restricted. Species are considered vulnerable during breeding, while they are still in the juvenile stage, and during periods where they have to seek refuge.

Aquatic

In addition to the indigenous conservation mechanisms that limit access to breeding grounds of fishes in the Agusan Marsh, the Manobos have been strict about disallowing the catching of fries. This is reflected in the Manobos' traditional fishing methods which are designed to capture only larger fishes. These methods include:

- Panikop: the use of bare hand
- Paniangat: bow and arrow
- Tabon: box trap with big slats
- Bobo: bamboo made tubular basket trap
- Pangawil/Pangawad: a hook and line attached to the stick planted on the ground. The bait is just above the water so only the big fish can jump to it.

Even though the above-mentioned fishing practices allow fish populations to remain stable, this is difficult to prove, since new methods and fishing gear (e.g. smaller meshed nets, pukot), which do catch young fish, are increasingly being introduced. For this reason, stricter access regulations have been established for some lakes, as previously mentioned. Additionally, modern fishing gears and destructive electrofishing have been banned by both the community and barangay leaders.

The Manobos also closely observe the life cycle of the large Asiatic apple snail (kambuays, Pila ampullacea). Only fully-grown snails –which usually float on the lake, while the young usually creep on the ground—are harvested for food. Further, the lime of the powdered shells is used for chewing betel nut and therefore forms an important part of the rituals (pang-apog).

Since the snails serve both nutritional and spiritual purposes, maintaining these snails' population is especially important to the Manobos.

Scientifically, this specie's conservation status is of least concern and was found in several research sites[14] while being rare in most other habitats. Despite the Manobo practice, Pila ampullancea's population is declining because of the introduction of the Golden Apple Snail which compete for the same habitat and food.[15]

[14] CSU (2015): Manabilid Creek (La Flora, Talacogon) and Kanembaylan Centre (Panlabuhan, Loreto)
[15] Vivian C Peligro, Joycelyn C Jumawan (2015): Aquatic Macroinvertebrates Diversity and Riparian Channel and Environmental Inventory in Gibong River, Philippines. In: Journal of Entomology and Zoology Studies

Terrestrial

The Manobos also extend the same protection to terrestrial species when such species are found to be vulnerable. For example, when their habitats are threatened by floods, terrestrial species naturally seek refuge on higher grounds. During such time, hunting of monkeys, bats, wild boar, and rodents is not allowed. This is borne from the Manobos' belief that the mababaja, as well as the spirits, prohibit the killing of anything that is in the process of seeking safety. When violated, extreme storm and diseases are expected to befall the community.

Identified refuge areas during flooding are the burial grounds of Buyod, areas close to Kasawangan, and portions around Benoni Lake and Yutob, which are close to Poblacion Loreto. According to the Manobos, protecting these refuge areas has helped maintain the population of the fauna in the Agusan Marsh over the centuries.

From a scientific standpoint, these refuge sites are deemed very important for animals that seek protection and food. The Manobos' respect of such natural occurrence is an example of reciprocal and regulatory behavior. However, it is difficult to prove this correlation, since the number of animal refuges dwindled over the years due to habitat destruction by timber poachers and flooding of areas formerly used as safe havens due to desecration and sedimentation caused by the extractive industries.

Further, the Manobos do not allow hunting in the areas where migratory birds forage – usually from October to December. Such birds are considered 'visitors' who need to be fed. If this is not respected, the Manobos believe the spirits will be angry and will bring harm to the offenders.

It is only in January or February, when the birds have already been well-fed and considered to have had enough stay in the area that the traditional hunting season starts. Since this coincides with the departure of migratory birds, those birds which are left behind are perceived to be too fat to fly—indicating that the spirit is providing such birds as food for their good meat.

Scientifically, it has been proven, that migratory birds that become an overstaying resident in an area can be harmful to the diversity of the place by disturbing the natural food chain.

Promotion of diversity and fallow periods for regeneration in livelihood activities

The Manobos of the Agusan Marsh have a variety of livelihood sources and a wide range of cultivation methods to choose from, allowing them to compensate for certain activities that are restricted either temporarily or only for specific sites. Diversification has not only been proven to be economically feasible, but is also an important adaptation mechanism for seasonally changing environmental conditions.

Terrestrial

Pamuayas is the Manobo system of cultivation (awang), which is usually integrated into multi-canopy farms, allowing sunlight for all crops.

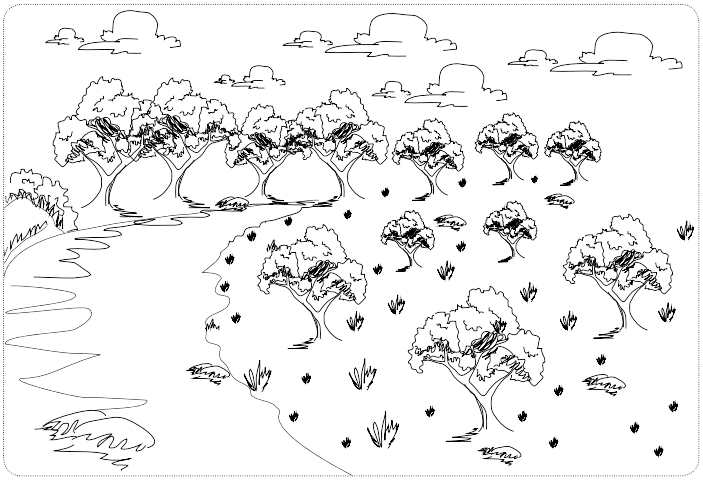
Before any cultivation activities are done, the baylan or elder asks the spirits, through a ritual (timaya), to allow them to use the land. The spirits communicate to the Manobos through the white-eared brown dove (alimokon, phapitreron leucotis [refer to the image on page 19]). The Manobos believe that the direction from which the call comes indicates whether the spirits allow cultivation. The land is only cleared if they are given permission, otherwise the Manobos transfer to another area. If permission is not granted after three requests, the person who made the requests will not be able to cultivate for a year and would turn to other livelihood activities or help relatives cultivate their land.

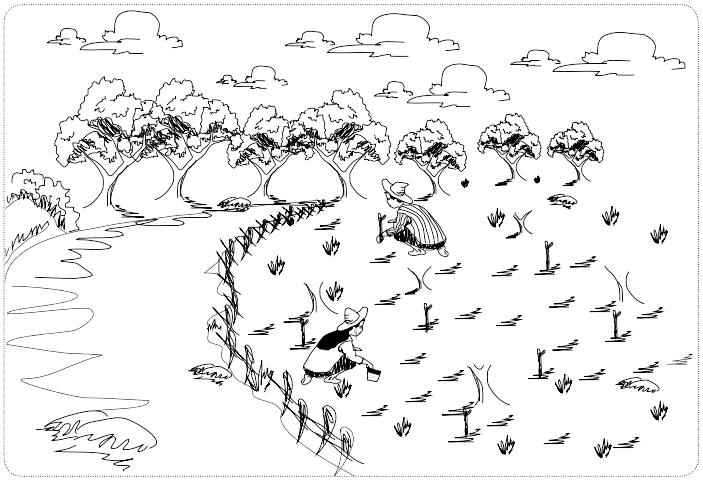
The Manobos also read the stars (pamituon) and observe the position of the moon to time the clearing of the fields and propagation. Further, the lunar system helps define the optimal alignment of the fields, taking into consideration the wind and sun movement throughout the year.

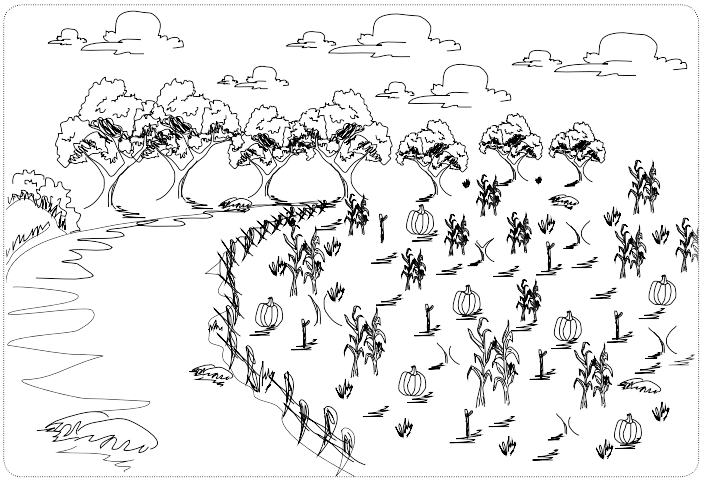
Once permission is granted by the spirits and the lunar system has been analyzed, the Manobos can start preparing the land. Depending on the soil's moisture, the vegetation is either burned (for dry areas) or cut and piled upstream to help protect the field against flooding (for wet areas). The cuttings from vegetation are chopped to facilitate decomposition.

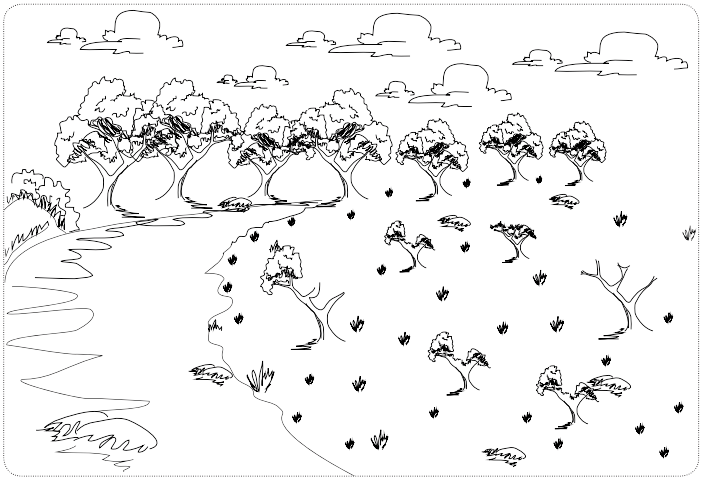
After about two months, the men prick the ground using sticks, while the women fill the holes with seeds. By pricking instead of plowing the soil, the land is not turned or pulverized and underground roots remain intact, preventing erosion. Sowing is usually not done in rows but randomly to reduce the spreading of pests such as the borer family, and consequently addressing the vulnerability of the crops. In the past, Manobo women kept hundreds of native rice varieties which have been replaced by hybrid varieties brought in by migrants and the government. At present, it has been validated that 11 native rice varieties can still be found in the Agusan Marsh.

The fields are taken care of by the Manobo women for approximately four months. They weed and plant cover crops such as sweet potatoes, antimon (squash), watermelon, and peanuts. This integral farming system enhances the agro-biodiversity, as different varieties of the main crop as well as intercrops are planted.









The cover crops serve several purposes:

1. As secondary crops which provide produce for the community's subsistence;
2. As instrument for soil conservation by maintaining moisture and nutrients in the soil and preventing erosion through various rooting systems of crops; Simple comparisons between the soil of adjacent plowed fields and the Manobos' awang show that the plowed field are harder and drier while the awang are able to maintain moisture better.
3. As pest control because through inter-cropping, pests are diverted from the main crop.

Since the use of pesticides is not allowed due to the belief that these would kill life and poison the spirits, the Manobos keep their traditional awang free from chemicals.

Besides intercropping, the Manobos have developed a variety of ways to manage pests:

- Respecting indications from the lunar system allows for precise timing of the crops' fruiting period, i.e. when pests are 'dormant';
- Seeking the direction from the spirits to ensure that the awang that does not lie in a pest infested area (pandahalan);
- Maintaining buffer zones in the cultivated area to prevent easy spread of pests;
- Performing rituals such as kujab, where black chicken is offered to the diwata[16] to protect the crops from any pests or insects;
- Hanging dead animals, snails or other smelly matter a few meters away from the crops to ward-off pests and expose them to other predators such as birds; and,
- Placing corn bran, sweet potato peelings, and other food strategically around the cultivated areas –similar to inter-cropping—to divert pests from the crops.

After harvesting the main crop, a big ritual is held to give thanks to the spirits and symbolically close the use of the land. While left to grow at the fallow, the cover crops spread and are able to continue providing

fruit for another one to two years. Pioneer tree species start growing and once they become tall enough, the shade they cast causes the cover crops to die and the climax vegetation to emerge. Fields are traditionally left at fallow for 15-20 years, having a positive impact on biodiversity in terms of renaturation. However, due to population pressure, the fallow time has been reduced and some awang are being converted to conventional, permanent farms, adversely impacting the biodiversity since its capacity to regenerate is reduced. The Manobos try to address this threat by leaving natural patches between their farms so that established trees and a diverse flora will be maintained adjacent to the area cultivated. Examples of these natural patches can be found in Benoni, Kasawangan and Tugno.

Aquatic

The traditional practice of allocating different fishing grounds each season (handuga) was discontinued in the Agusan Marsh, with the reduced number of fishes no longer providing for the communities' subsistence. However, some communities, such as Panlabuhan in Loreto, are reintroducing a rotational system, which alternately allocates lakes for fishing and protection. The system also designates who is allowed to conduct which activities during a certain time frame.

The mainstream local conservation group, Bantay Danao, has been trained and mandated to support the implementation of this system.

Protection of specific species

Mindanao Tarictic Hornbill (Kalaw, *Penelopides affinis*)

The hornbill, especially its nests, is under complete protection by the Manobos. This means that no activities are allowed within a certain radius, e.g. 25 ha. in Loreto, of the nests. The protection of the kalaw is taught to the Manobo children at an early age. Calling at 6 A.M. and 6 P.M., the hornbill functions as a clock to the Manobo. Additionally, it is known for its capacity to 'tell' the fisher folk where they can get plenty of fish.

Scientifically, the endemic Mindanao Tarictic Hornbill is of least conservation concern. However, its presence is considered an indicator of a healthy forest because of the hornbill's complex dietary requirement all-year round. This means that if the kalaw is abundant, a large area of vegetation with a high variety of fruiting plants as well as insects and lizards, must be intact. Therefore, the Agusan Marsh has kept a kalaw sanctuary which is a special protection zone. Sightings are rare, but the CSU recorded in 2013, four sightings as did Sucaldito-Salibad/Nuneza in 2014.

[16] A deity or spirit

White-Eared Brown Dove (Alimokon, *Phapitreron leucotis*)

The alimokon is the omen bird for the Manobos. They believe that the spirits communicate with them through the dove, specifically warning them of impending danger. Prior to going to an important event, the Manobos would communicate with the spirits and listen to alimokon for a reply. The direction from which the dove can be heard is significant. A sound from the left, means danger and the plan should be postponed. If heard from behind on the right side, pursuing the endeavor is not dangerous but achieving the goal may be difficult. When the alimokon calls from the front, especially from front right, the signs are very good and the person can expect a fruitful and safe trip. The alimokon also communicates with the Manobos during the selection of a site for cultivation, fishing or any other livelihood activities.

From a scientific perspective, the White-Eared Brown Dove is of least concern when it comes to conservation. It is endemic to the Philippines. The CSU recorded 15 sightings in 2013 while the Sucaldito-Salibad/ Nuneza reported sightings in 2014. The dove has been very helpful in dispersing seeds thus increasing the propagation of plant species.

Flying Fox (Kabug, *Acerodon jubatus*)

The Manobos conserve the roosting site of kabug because of these animals' unusual features. They are amazed at how these animals that look like rats can fly, but are not birds. The Manobos believe that the kabug is an animal of tagbanwa, the feared spirit, and thus, the kabug cannot be eaten.

Furthermore, the Manobos observe that the waters around the kabug's roosting site correlate with high fish populations. This has further reinforced their decision to conserve the kabug's roosting areas, not just to align with their beliefs but also for economic reasons.

From a scientific standpoint, the flying foxes are prolific seed propagators and pollinators. Thus, they play an important role in maintaining ecological balance in the area. The Agusan Marsh is home to 15 species of flying fox, six of which are endemic to the Philippines and have been listed as endangered species. The CSU recorded two sightings in 2013. Sucaldito-Salibad/Nuneza also reported sightings in 2014. Flying fox roosts can be found in Loreto, Talacogon, Caimpungan, and Panlabuhan.

Despite threats like the introduction of kite hunting, a study made in 2016 indicated a stable population of flying foxes. It also pointed to the imperative that protection of the roosting sites and large trees is imperative to the survival of the flying foxes in the Agusan Marsh.

Giant scops owl (Ukang, *Mimizuku gurneyi*)

The Manobos do not hunt the ukang due to the belief that it watches over the Manobos cultivation. The owl also helps control rodents and other farm pests without killing domesticated animals such as chicken. The Giant Scops Owl is endemic to the Philippines and has been listed as a vulnerable species by the International Union for Conservation of Nature (IUCN) in 2016. Deforestation has been the main culprit. The CSU recorded only one sighting in 2013, which was confirmed by Sucaldito-Salibad/Nuneza in 2014.

Black-faced Coucal (*Centropus melanops*) and Philippine Coucal (*Centropus viridis*) (Ubon-Ubon)

The Manobos consider the ubon-ubon bad omen. They believe that the bird's call is a portent of an impending negative event. In fact, they do not touch the coucals due to fear of death in the family.

Both the Black-faced coucal and the Philippine coucal are endemic to the Agusan Marsh and are of least concern to conversation. In 2013, CSU recorded 24 Black-faced Coucal and 48 Philippine Coucal sightings. In 2014, both species were sighted by Sucaldito-Salibad/Nuneza and were validated to be abundant in the Agusan Marsh.

Medicinal Plants

There is a wide variety of medicinal plants in the Agusan Marsh, which are considered an important gift of the magbabaya. Communal access is ensured even if the plants grow within one clan's land. Some are common and picked by everyone, while others are only known to mothers or healers, who were taught as worthy holders of this knowledge.

It is believed that if medicinal plants die, they will not be effective or can even become harmful. Therefore the collector must promise to the spirit that only the needed amount is picked and that no harm is done to the plant. This means that even if the roots are needed, the collector must ensure that enough is left for the plant to survive. If medicinal species are plentiful, the Manobos protect the whole area in order to maintain their supply. Out of respect and in anticipation of a healing experience, the Manobos care for the plant that save them. This practice reflects the Manobos' mindset of reciprocity. In the Agusan Marsh, many patches of forest are protected due to the medicinal plants that grow in them. These areas, such as Lake Tugno, are usually diverse and intact.

Out of respect for the Manobos' intellectual property rights, the names and uses of specific species cannot be provided in this paper.

Sago Palm (*lumbia, Metroxylon sagu*)

Apo Sandae, an ancestor of the Manobos, planted many sago palms around La Paz and Talacogon. Apo Sandae predicted that sago will save the Manobos from hunger. During World War II, this prophecy came true as the Manobos subsisted on sago starch, saving them from starvation. Since then, sago has become a food for the Manobos during lean months and is only allowed to be extracted when other food sources are scarce. In order not to enter the sago forests, the Manobos have developed a method of harvesting floating sago. Areas where sago palms grow are therefore pristine and serve as refuge for several fauna species.

Conclusion

The Manobos of the Agusan Marsh treat as sacred the natural resources that abound in their communities. They are prudent in their practices and have imposed strict norms to ensure a respectful relationship between humans and the natural environment.

The research was able to identify and describe the indigenous regulatory mechanisms that have allowed the Manobos to use their natural resources within the ecosystem's organic limits. These mechanisms help explain the high biological diversity of these ancestral domains.

In line with the methodology's objective of integrating IPs and their practices into a more holistic and reality-based resource governance and management, the research contributes to increasing both the IPs' and government agencies' recognition of the importance of some indigenous practices, and their positive effects on conservation.

The IPs are reviving some of their lost traditional practices and are consciously imparting their ecological knowledge to their children. The DENR, for its part, has adopted some IP practices, like tree-planting methods, in its major programs such as the National Greening Program. Meanwhile, the Protected Area Management Board (PAMB) has passed a resolution disallowing the use of destructive fishing gear, while promoting traditional fishing practices and tools.

At the same time, the research was confronted with the fact that indigenous knowledge and practices have partially been lost and replaced by contemporary conventional knowledge. This makes it difficult to provide figures on linkages between individual activities and their effect on biodiversity. Moreover, external, often destructive influences have further aggravated the situation.

It is worth noting that by using an integrative approach, the research process empowered the IPs, building their confidence and lines of reasoning in standing up for their right to manage and protect their ancestral lands. Ideally, this knowledge will inform the planning processes of local and national governments, on management and policy-setting for the ancestral domains and protected areas.

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