



Mangrove
reforestation
© MNP

OUR PROTECTED AREAS ARE VITAL TO OUR DEVELOPMENT

White Paper resulting from the study on the economic value of protected areas in Madagascar, August 2022

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INTRODUCTION

In Madagascar, the economic and social importance of protected areas is generally unknown and greatly underestimated by much of the population. This lack of knowledge frequently leads to questions about their usefulness for much-needed economic growth. Should we maintain our protected areas? If so, for what reasons?

This White Paper, a synthesis of the study entitled *The Economic Contribution of Madagascar's Protected Areas - A review of the evidence*, provides answers on the importance of protected areas. The study evaluated a selection of the essential services and products provided by nature within Madagascar's protected areas at the local, national and global levels.

This document, entitled «*Our protected areas are vital to our development*», is intended for the nation's leadership who hold the fate of the population in their hands: national and local authorities, civil society, church leaders, media, intellectuals, youth, etc. It is designed to help them better consider and integrate the value of protected areas into political and financial decision making. It is time for protected areas to progressively be placed at the center of national and local decisions to ensure sustainable economic and social growth.

Findings from the study show that sustainable economic development in Madagascar will depend also on the further development of its protected areas system. Maintaining all the existing ecosystem services of protected areas will be far more advantageous than intensive exploitation, for short term gain, the resources they contain.

1

WHAT TO KNOW ABOUT MADAGASCAR'S PROTECTED AREAS

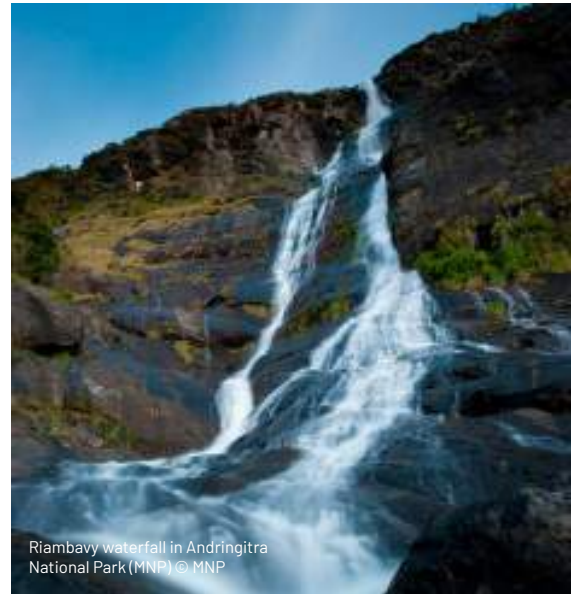
Protected areas are delimited territories, terrestrial or aquatic, which have an important biological and economic value and which require, for the common interest, preservation.

Protected areas include:

- National and natural parks,
- Special reserves, integral nature reserves, and natural resource reserves,
- Natural monuments,
- Protected harmonious landscapes.

Terrestrial protected areas include mainly forests (wet, dry or thorny), wetlands and savannahs. Often, these forest areas contain important water bodies such as lakes and rivers. They are usually surrounded by community managed forests forming «green belts» around them.

Marine protected areas consist mainly of coastal marine waters, coral reefs, mangroves and beaches with associated fishing areas, often integrated or contiguous with Locally (Community) Managed Marine Areas (LMMAs).



ECOSYSTEM SERVICES OF PROTECTED AREAS

Ecosystem services are the benefits humans derive from nature, which are classified into three categories: provisioning, regulating and cultural. Provided for free by nature, these services are commonly assumed to be inexhaustible. Unfortunately, that is not the case.

In fact, their value is considerable, and intensive exploitation will limit their availability. To understand the value of these ecosystem services, experts have made monetary estimates. The results are summarized in the following sections of the paper.

Provisioning services

are products provided by nature, such as drinking water, food, fuel, wood, or medicine;



Cultural services

are non-material contributions of nature, such as aesthetic, spiritual, recreational, tourism and educational aspects;



Regulating services

are ecosystem benefits such as climate regulation, flood mitigation, prevention of soil erosion, protection of coastlines from cyclones, pollination in agriculture or disease reduction;

Madagascar has¹:



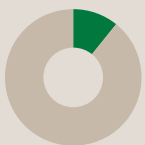
101
terrestrial
protected areas

22
marine
protected areas

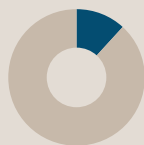


6,233,317
ha of protected
land surfaces

1,379,029
ha protected
marine and
intertidal surfaces



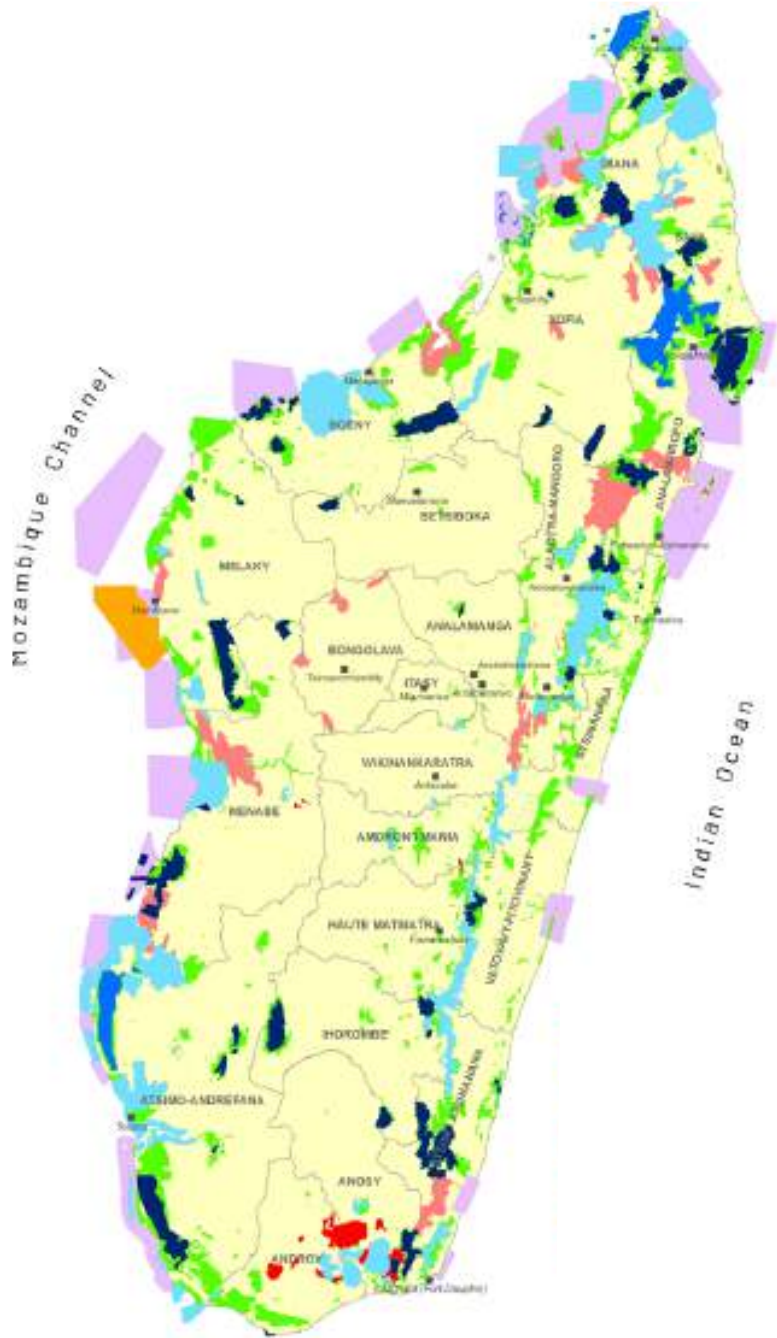
covering
10.8%
of the land
territory



covering
11.8%
of the coastal
seas

¹ SAPM data from 2017

Map of Madagascar's Protected Areas in 2022



- PA before 2003
- PA between 2003 and 2014
- PA in 2015
- Orphan PA
- NPA in progress (Barren island)
- Priority site to be PA
- Potential site to be marine and coastal PA
- Potential site for PA
- Region border

Sources: SAPM; BD 500 FTM
Realization: WCS ReBioMa
Edition: February 2022



ECOSYSTEM SERVICES OF PROTECTED AREAS AND THEIR ECONOMIC CONTRIBUTION

- Provisioning Services
- Cultural services
- Regulating services

Biodiversity and genetic resources

Materials for building, households goods, fuelwood and other biomass for energy

Tourist attractions and leisure

Scientific research and discovery

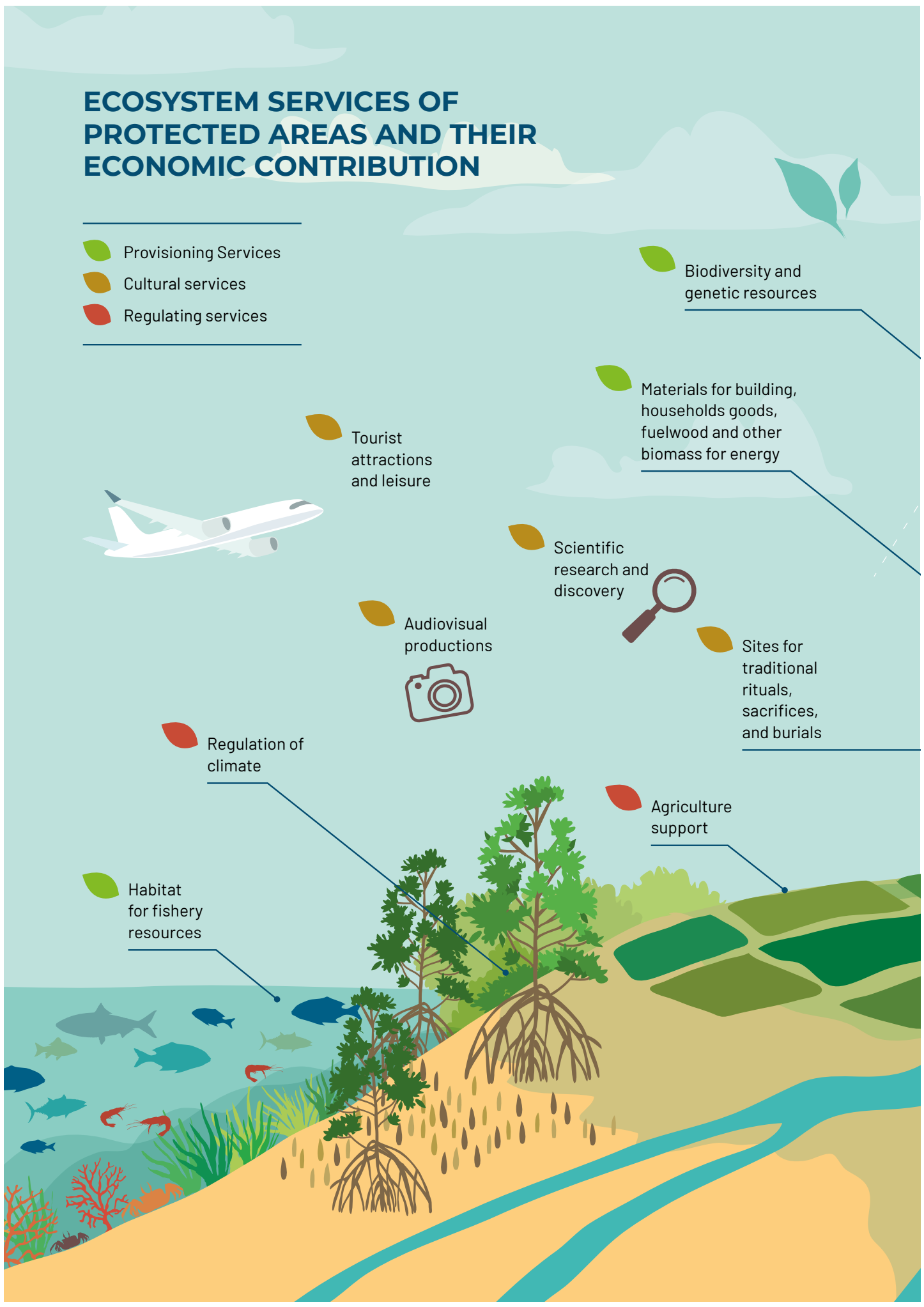
Audiovisual productions

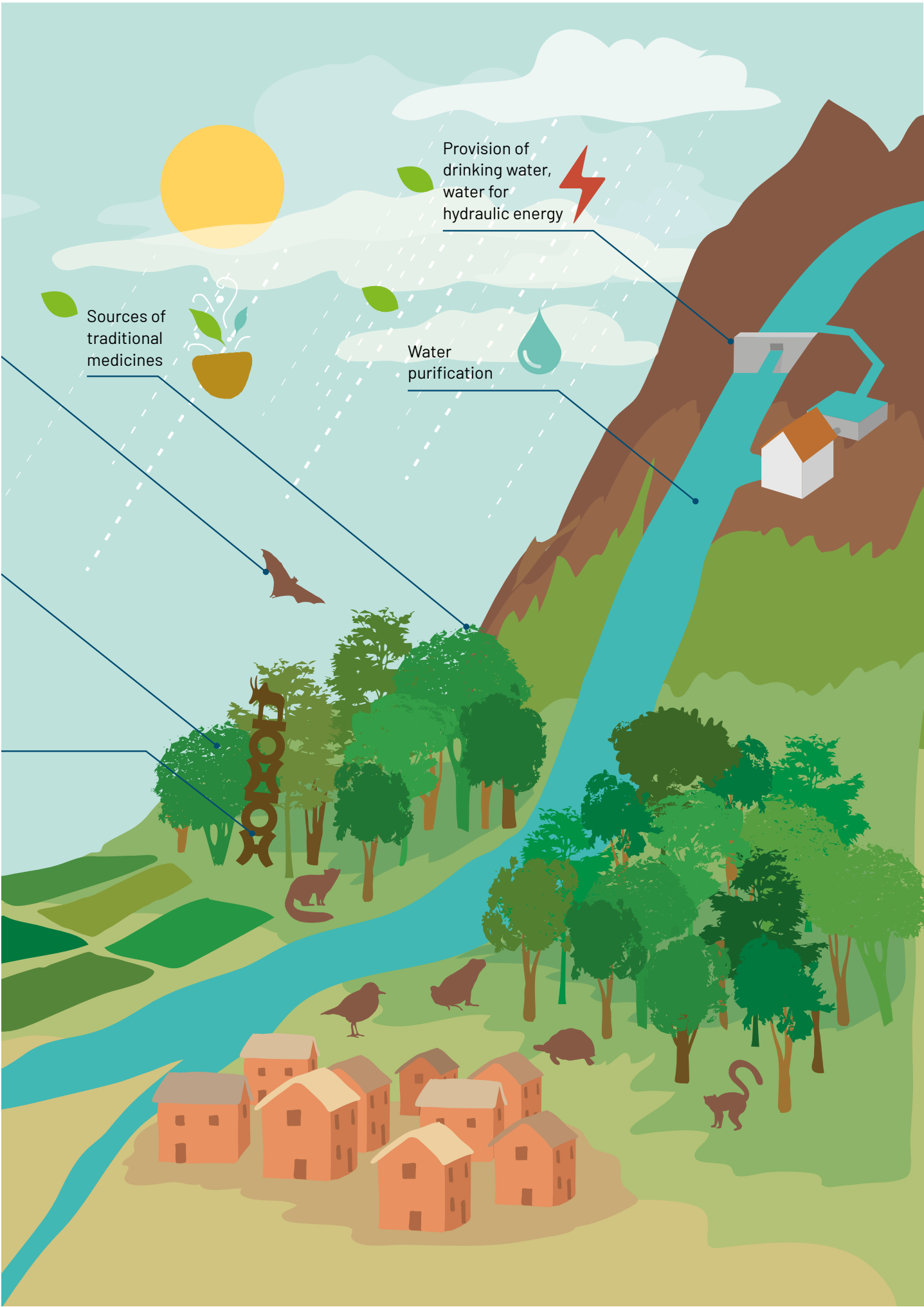
Sites for traditional rituals, sacrifices, and burials

Regulation of climate

Agriculture support

Habitat for fishery resources








Sources of traditional medicines

Provision of drinking water, water for hydraulic energy

Water purification

2 SUMMARY OF THE WHITE PAPER

The economic contributions of biodiversity and ecosystem services from existing protected areas in Madagascar described in the study can be estimated at the local (for communities living around protected areas), national (for the entire Malagasy population) and global (for humanity) levels. These estimates are summarized in the following table:

	Level	Ecosystem services	Economic contributions (USD ² /year)
	Local	Tourism, beekeeping, fishing, raffia handicraft, etc.	444 - 579 million ³
	Terrestrial national	Drinking water, agriculture, animal husbandry, hydroelectric power, tourism, carbon storage, scientific research, biodiversity conservation, audiovisual productions	215 - 329 million ⁴
	Maritime national	Fisheries products, carbon storage, mariculture, mangroves, tourism	195 - 199 million ⁵
	Global	Climate regulation, biodiversity conservation, genetic resources, tourism, scientific research, film production	3,67 - 17,27 billion ⁶



Local level: Protected areas are essential to local people's lives and well-being.

The local economic contribution of Madagascar's protected areas is estimated at about USD 500 million per year⁷. This represents an average of USD 66/ha/year⁸.

The water that communities drink and that irrigates their fields, the food they eat, the firewood/cooking fuel they use, and the traditional medicines used to treat illness all come directly or indirectly from protected areas and contiguous ecosystems. Natural ecosystems thus preserve and generate much-needed natural resources for local communities. In addition, protected areas provide health benefits to the local population and are keepers of traditions by hosting many cultural and religious sites.



National level: Protected areas contribute to key national economic sectors.

The national economic contribution of protected areas in Madagascar represents about USD 450 million per year⁹, or an average of USD 59/ha/year¹⁰.

Of the essential inputs that support economies, a remarkably high number come from protected areas. The important circular economic sectors of tourism, energy, environment, health, agriculture, livestock and fisheries benefit at many levels from Madagascar's protected area network:

- **Water:** Hydraulic sources from protected areas supply drinking water to local communities as well as to the populations in big cities;
- **Energy:** Protected areas secure springs and watersheds near hydropower stations from silting and drying up;

2 Exchange rate : 1 USD 2021 = 3,975 MGA
 3 MGA 1,760 billion to 2,300 billion
 4 MGA 850 billion to 1 310 billion
 5 MGA 780 billion to 790 billion
 6 MGA 14,500 billion to 68,500 billion
 7 MGA 1,990 billion
 8 MGA 260,000

9 MGA 1,790 billion
 10 MGA 230,000

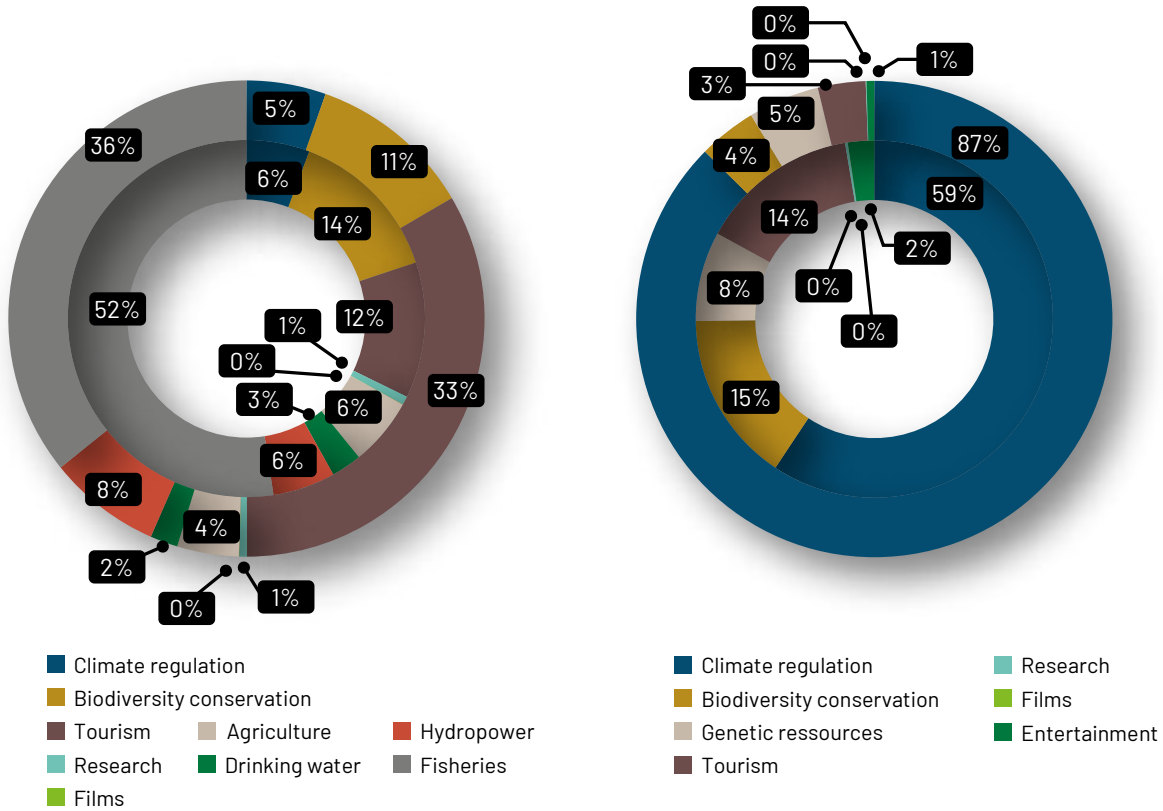
- **Tourism:** Ecotourism in protected areas promotes creation of both direct and indirect green jobs and contributes to foreign exchange earnings;
- **Agriculture:** protected areas support agricultural resilience in various forms, such as seed or seedling distribution, agricultural irrigation, soil erosion control and crop pollination;
- **Fisheries:** MPAs, lakes and reservoirs within protected wetlands contribute to the sustainability of fisheries yield and the development of the blue economy;
- **Environment and climate:** Protected areas capture and store a considerable amount of carbon that could be sold on the international carbon market and become a significant source of financing and employment, through ecosystem conservation activities.



Global level: Protected areas mitigate global warming.

The global economic contribution of Madagascar's protected area network, if managed sustainably, is around USD 7.74 billion¹¹ per year, or USD 1,017/ha/year¹².

In terms of climate regulation alone, the capacity of protected areas to capture and store carbon would generate an added value of around USD 6.25 billion/year¹³ or about USD 821/ha/year¹⁴. With the high rate of their biodiversity endemicy, Madagascar's protected areas contribute to the conservation of world heritage and genetic resources, which could be exploited for medical, cosmetic, or other solutions. There are also cultural benefits that include the contribution of our protected areas to scientific research, the rise of international tourism and the development of creative industries by inspiring films, animations and documentaries.



11 MGA 30,000 billion
 12 MGA 4,040,000
 13 MGA 20,000 billion
 14 MGA 3,260,000



Ecotourism in Andringitra National Park (MNP) © MNP

AS OUR PROTECTED AREAS GENERATE VALUE, WE MUST ACT TO CONSERVE AND VALUE THEM.

Biodiversity conserved within Madagascar’s protected areas is a valuable natural capital that has a strong potential to support the country’s sustainable economic growth. Therefore, we need to:

<p>Maintain and develop Madagascar’s protected area network:</p>	<p>Implement sustainable financing solutions for the effective operation of the protected area system:</p>	<p>Act in the best interests of local communities:</p>
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- | | | |
|--|---|---|
| <ul style="list-style-type: none"> • Protect key biodiversity areas (KBAs); • Develop an ambitious strategy for Madagascar’s Protected Areas System (SAPM); and • Strengthen advocacy with the nation’s leaders and other important major stakeholders. | <ul style="list-style-type: none"> • Subsidizing the operation of protected areas; • Mobilize global sustainable financing initiatives and major donors; and • Adopt innovative financial solutions. | <ul style="list-style-type: none"> • Set up mechanisms to equitably redistribute benefits to communities; • Include the private sector, a key success factor for value chains; • Strengthen the capacity of communities to manage protected areas. |
|--|---|---|

3 CONTRIBUTIONS OF OUR PROTECTED AREAS AT THE LOCAL LEVEL

Using case-studies of 7 protected areas (Ankarafantsika, Mahavavy-Kinkony, Antrema, Ranomafana, Makira, Mantadia and Nosy Tanikely), the study evaluated the avoided costs and the income earned by the communities living near these protected areas.

Economic contribution (USD)

<p>Ankarafantsika 133,000¹⁵</p>	<p>CMK [24 to 26 million]¹⁷</p>	<p>Mantadia [229,000 to 2 million]²⁰</p>
<p>Ranomafana [14 to 22 million]¹⁶</p>	<p>Antrema 282,000¹⁸</p>	<p>Nosy Tanikely 2 million²¹</p>
<p>Makira 4 million¹⁹</p>		

15 MGA 529 million
16 [MGA 60 billion - 90 billion]
17 MGA 100 billion
18 MGA 1.12 billion
19 MGA 20 billion
20 [MGA 910 million - 10 billion]
21 MGA 10 billion

The following two cases illustrate the economic contribution to the local population:

1. RANOMAFANA NATIONAL PARK

Created in 1991, Ranomafana National Park, covering an area of 40,556 ha, contains many of the country's flagship species. To list just a few: more than 80 species of orchids, 124 species of birds, and 14 species of lemurs. The National Park is listed as a Unesco World Heritage Site as part of the Atsinanana eastern rainforests.

The National Park is a true microcosm of ecotourism with: 27,338 visitors in 2019. The number of hotels increased from 1 hotel in 1991 to over 30 in 2019 and the number of guides increased from 33 in 2001 to 52 in 2011. Revenues from tourism totaled **about USD 2.22 million/year**²² in 2019, equivalent to USD 55/ha/year, redistributed locally and nationally.

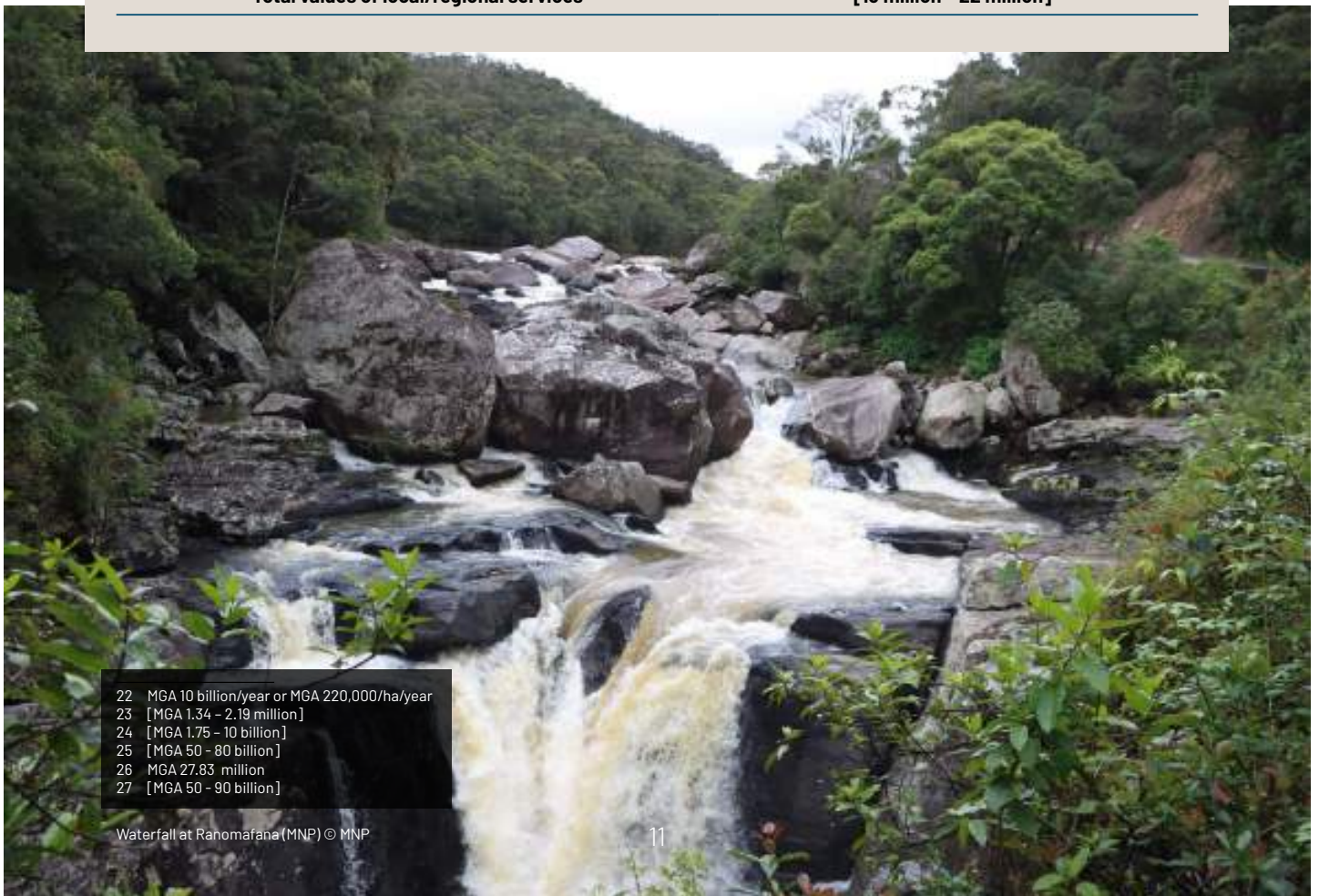
Adding Ranomafana's significant contribution to generating hydroelectricity at the regional level, as well as its contributions to agriculture through irrigation and erosion control, the site is one of the most valuable terrestrial protected areas in Madagascar with a contribution of **USD 338-550/ha/year**²³.



Local and regional economic contribution of Ranomafana National Park (USD/year)

Ecotourism (entrance fees, lodging, etc.)	[444,000 – 2,000,000] ²⁴
Hydroelectricity	[13 million – 20 million] ²⁵
Water protection (willingness to pay)(local)	7,000 ²⁶
Total values of local/regional services	[13 million – 22 million]²⁷

Touristes à Ranomafana (MNP) © MNP



22 MGA 10 billion/year or MGA 220,000/ha/year
 23 [MGA 1.34 – 2.19 million]
 24 [MGA 1.75 – 10 billion]
 25 [MGA 50 – 80 billion]
 26 MGA 27.83 million
 27 [MGA 50 – 90 billion]

2. ANTREMA BIOCULTURAL SITE

Antrema Biocultural Site²⁸ is located in the northwest coast of Madagascar, rural commune of Katsepy, district of Mitsinjo, Boeny region. The protected area covers 20,620 ha, including 1,000 ha of marine habitats, notably mangroves, and 19,620 ha of terrestrial habitats, notably inland wetlands and forests.

In Antrema, mangroves, lakes and water reservoirs are major sources of fishery provisioning services, or habitats, which support the fishing communities, the main economic activity of the area.

Forests, including mangrove forests, also contribute significantly to other local income generating activities such as beekeeping and crafts made from raffia and satrana. They also provide useful wood products for construction.

The value of ecosystem services from Antrema Biocultural Site is estimated at USD 282,317/year, based on estimated services provided by 6,428 ha (about 30% of the protected area), or USD 43.92/ha/year on average²⁹.

Due to lack of data, the contribution of water (lake and groundwater) to agriculture and other sectors was not considered. Since ecotourism is still in its early stages, it was not included either. As ecotourism develops, the value of the protected area will again increase.

Contribution of Antrema to the surrounding communities per year

		MGA	USD	
Dry forest	Honey	2,654,668	668	
	Lambo (wild boar)	1,327,334	334	13,649
	Raffia	1,567,913	394	
	Satrana	48,704,860	12,253	
Lakes & Reservoirs	Fishing	255,528,900	64,284	64,284
	Honey	2,116,636	532	
	Wood	64,001,635	16,101	
Mangroves	Shrimp	352,724,476	88,736	204,384
	Crabs	93,404,569	23,498	
	Fish	300,179,083	75,517	
Total				282,317

Craftswoman in the protected area of Antrema (MNHIN) © FAPBM

4 CONTRIBUTIONS OF OUR PROTECTED AREAS AT THE NATIONAL LEVEL

The contribution of protected areas at the national level totals USD 410 to 528 million/year³⁰. What exactly do they contribute?

Landscape of Masoala National Park (MNP) © MNP

28 Commune rurale de Katsepy, district de Mitsinjo, région de Boeny

29 MGA 1.12 billion/year or MGA 170,000/ha/year

30 [MGA 1,630 – 2,100 billion]

1. OUR PROTECTED AREAS SUPPORT OUR AGRICULTURE

Contribution of terrestrial protected areas to the agricultural sector

→ Ecosystem services

Crop irrigation
 Maintenance of the water table (subsoil water)
 Protection of soil against erosion
 Maintenance of soil fertility (through biomass)
 Pollination of plants by bees and other fauna
 Mitigating the impacts of extreme weather events

→ National economic contribution

**USD 23 million/year³¹,
 or USD 22/ha/year for the 15 MNP national parks³²**

→ Beneficiaries

Farmers in the vicinity of protected areas



Farmers from Andranomena (MNP) © MNP

80% of the Malagasy people live from agriculture, very often on a small scale. Basic food crops (notably rice) and cash crops (vanilla, cocoa, cloves, sugar cane, etc.) often benefit from nearby protected areas.

Their forest ecosystems maintain the water table (subsoil water) by preserving springs and water reservoirs that irrigate downstream and surrounding crop areas. Protected areas help stabilize the soil and local climate by mitigating the impacts of extreme weather events. They also maintain soil fertility. Biodiversity in protected areas helps to ensure plant pollination by bees and other insects.

Preserving protected areas thus contributes significantly to agricultural production, both in quality and quantity.



Rice field in the district of Marovoay near the protected area of Ankarafantsika (MNP) © FAPBM

FOCUS 1. TERRESTRIAL PROTECTED AREA OF ANKARAFANTSIKA

Marovoay and Ankarafantsika, water and rice

Ankarafantsika National Park illustrates the importance of protected areas for the agricultural sector. Through the ecosystem services of soil stabilization, the national park prevents sedimentation of Marovoay, one of the largest rice plains in Madagascar, which covers nearly 38,000 ha of cultivable area.

A recent study showed that due to the onset of sedimentation in the vicinity of the park, the Marovoay plain has lost on average 2% to 4% of its cultivable area annually, equivalent to a production of MGA 3 billion/year (USD 858,000). Effective preservation and restoration of the protected area will help to maintain and increase rice production.

³¹ MGA 90 billion/year or MGA 90,000/ha/year - Update of Carret and Loyer 2004 estimates - includes only 19 of the protected areas, thus a conservative estimate

³² Basis of calculation: Costs saved through rice field irrigation and sedimentation control by farmers in 15 MNP national parks (1,102,949 ha) upstream of rice fields. It should be noted that the estimate is very conservative as it does not take into account new protected areas created since 2003

2. OUR PROTECTED AREAS ARE SUSTAINABLE SOURCES OF FISHERIES PRODUCTS

Contribution of marine protected areas to the fisheries sector

→ Ecosystem services

Conservation of biodiversity including flagship species and underwater landscapes (mangroves, coral reef, marine turtles, etc.)
Contribution to fish and shellfish breeding and growth

→ Contribution to national economy

USD 182 million/year³³, or USD 125/ha/year of income earned from fishing in marine protected areas

USD 10 million/year³⁴, or USD 135/ha/year of income earned from fishing in mangroves

→ Beneficiaries

Communities, local fishermen, their families
Collectors and exporters
Fish product consumers



Fishing activity in the protected area of Ambodivahibe (CI) © CI

Continental and maritime fishing is a substantial source of income for Madagascar (7% of GDP).

Madagascar has 21 protected areas which included wetlands listed under Ramsar Convention, including four of the country's largest lakes: Ihotry, Kinkony, Tsimembo, and Mandrozo. Through conservation actions in lake ecosystems (lakes, watersheds, surrounding forests, etc.), protected areas help to ensure the availability of fish and other fishery products. Many protected areas thus represent important opportunities for continental fishing. In addition, Madagascar has 22 MPAs as well as marine and terrestrial protected areas encompassing about 1.38 million ha of protected marine ecosystems. These MPAs are home to about 30% of the coral reefs and mangroves of Madagascar, in which significant marine biodiversity is found. They are complemented by LMMAs.

The challenge to divert users from the temptation of short-term gains and to manage marine resources sustainably. Marine protected areas are a mechanism that prevents overconsumption through the imposition of multiple sustainable fishing practices: use of legal fishing gears, limitation of the fishing season, maintaining closed areas in certain seasons to allow stock regeneration, etc.

FOCUS 2. AMBODIVAHIBE MARINE PROTECTED AREA

Community-based sustainable management of fisheries resources

Little known and yet close to Ramena beach (extreme North of Madagascar), Ambodivahibe bay is rich in fish resources, which benefit the fishermen of the rural communes of Ramena and Mahavanona.

This idyllic picture is however marred by the signs of the effects of climate change in recent years. The trade winds or *varatraza*, which used to flow over the region 6 months a year, now blow for to 8 months, limiting the activities of fishermen. This evolving constraint is compounded by unsustainable fishing practices.

To ensure sustainability of resources in this marine protected area, and reduce pressures on resources, the protected area managers developed alternatives to the fishing value chain³⁵.

The creation of the marine reserve was initiated in 2009 in parallel with the implementation of an LMMA. Managed by the communities, the establishment of areas reserved for fishing help ensure that production is renewed every year. Other subsistence activities have been identified and implemented with the villagers, including: poultry farming, ecotourism, beekeeping and sheep and goat husbandry...

All of these efforts have contributed to a significant decrease in the economic vulnerability of the communities. 60 fishermen now have a motorized vessel to market their products in remote villages. Active participation of the communities in conservation activities has helped to reduce pressure and improve the health of marine resources.

³³ MGA 720 billion/year or MGA 500,000/ha/year

³⁴ MGA 40 billion/year or MGA 540,000/ha/year

³⁵ A value chain is made up of links with different stakeholders/beneficiaries, from the production of inputs (seeds, seedlings, etc.) to the sale of products on the market. Therefore, developing business plans, including an economic model, is very important for the sustainability of the activity.



3. OUR PROTECTED AREAS ENSURE ACCESS TO CLEAN WATER FOR DRINKING AND HYDROPOWER

Contribution of forest protected areas to the water and energy sectors

→ Ecosystem services

- Securing water sources
- Protection of watersources against drought
- Supply of drinking water
- Supply of clean water to hydroelectric dams

→ National economic contribution

Hydroelectricity : USD 21 million/year (existing dams)
Each hectare of forest preserved helps to save USD 43³⁶ on the annual cost of electricity production

Protected areas near hydroelectric dams:

- Ranomafana National Park for the Namorona dam
- The NPA (New Protected Area) Ankeniheny-Zahamena Forest Corridor or CAZ for the Andekaleka dam and the future Volobe dam
- The NPA Tsinjoarivo-Ambalaomby for the future Sahofika dam

Drinking water: 10 million USD/year or 9.14 USD/ha/year³⁷

MNP protected areas only

→ Beneficiaries

15% of the Malagasy population, through JIRAMA

→ Potential for network expansion

Large dams in Sahofika and Volobe (under development)
 A potential of 98 micro hydroelectric dams at local community level near protected areas



Andekaleka Dam © 2424.mg

Nearly 50% of Madagascar’s electricity is supplied by hydroelectric dams. Five hydroelectric stations supply households and industries. These stations are themselves dependent on upstream water sources. This is also the case for fresh water necessary for our hygiene and our food preparation.

Many of the rivers supplying water for hydropower stations or human populations originate from protected areas, or are protected by adjacent protected areas. The water from rivers is provided for free by nature, but it does not mean that it has no value. This value can be estimated based on the market value of the water or by the avoided cost of restoring water sources following deforestation.

Conservation of forest ecosystems near dams and water sources is essential to prevent the risk of river depletion. With the expansion of hydropower in Madagascar, the value of protected areas will continue to increase.



Andranomitsangana waterfall in the protected area of Zahamena (MNP) © MNP

³⁶ MGA 80 billion/year or 170,000MGA/ha/an
³⁷ 40 billion/year or 40,000 MGA/ha/year

FOCUS 3. THE "ANKENIHENY-ZAHAMENA FOREST CORRIDOR" PROTECTED AREA

The linked fates of the Andekaleka Dam and the "Ankeniheny-Zahamena Forest Corridor" (CAZ) protected area

The Andekaleka hydroelectric dam provides power to Antananarivo, Moramanga and Andasibe. It is also connected to the Toamasina electricity grid, providing access to energy along an axis serving agro-industrial, mining and port activities. Built in 1981 with an investment of 142.1 million USD³⁸, the dam is fed by the Vohitra River which is fed by tributaries from a nearby forest watershed. This forest zone keeps the river's flow from the risks of drought while favoring rainfall. Part of this forest to the east of the river was made a protected area in 2015: the Forest Corridor Ankeniheny-Zahamena or CAZ (360,266 ha).

When it was built, Andekaleka had a capacity to produce 100 MW of electricity. However, this capacity has decreased progressively over the last 30 years and is now around 22 MW (a decrease of 78%). This accounts for the frequent load shedding and contributes to the more frequent power outages in Antananarivo.

This loss of capacity is a direct result of the degradation and deforestation of the watersheds, including part of the CAZ protected area. In 30 years, 23,675 ha of forest have been lost, depleting the Vohitra River and reducing the annual flow of the dam from 76.4 m³/s between 1980 and 1990 to 42.3 m³/s between 1990 and 2000.

In addition to causing economic losses to consumers, the drop in the dam's production has also resulted in a colossal loss of revenue for the national electricity company: USD 2,057,900/year³⁹.



4. OUR PROTECTED AREAS CONTRIBUTE TO THE FIGHT AGAINST CLIMATE CHANGE

Contribution of protected areas to the fight against climate change

→ Ecosystem services

Carbon uptake and storage by protected wet and dry forests (3,389,324 ha) and mangroves in marine protected areas (73,072 ha)

→ National economic contribution

USD 21-29 million/year⁴⁰ in expected revenues from the national REDD+ program

USD 47 million/year⁴¹ of total potential revenues (if all remaining forests are brought into the REDD+ program)

USD 5/t/year⁴² of potential revenue from the sale of carbon credits to countries and companies

→ Beneficiaries

15,500 animal breeders and 69,200 farmers near protected areas, benefiting from additional income
The Government of Madagascar



Mangroves in the Mahavavy-Kinkony Complex (Asity) © FAPBM

38 MGA 560 billion
39 MGA 8.129 billion

40 From FCPF - 110 - 120 billion
41 MGA 190 billion
42 MGA 20,000



Rainforest of the protected area of Maromizaha (GERP) © FAPBM

FOCUS 4. EASTERN RAINFORESTS - THE LUNGS OF MADAGASCAR

The REDD+ mechanism and the Eastern rainforests

- Relevant regions: SAVA, Sofia, Analanjirifo, Atsinanana and Alaotra-Mangoro
- 10 million tons of potential CO2 emission reductions from 6 235 720 ha of forested landscapes.
- Expected USD 50 million⁴³ over 5 years under the sales contract with FCPF (Forest Carbon Partnership Facility) i.e. USD 1.60/ha/year⁴⁴
- 2020 to 2024, i.e. a 4-year project

Eastern rainforests are huge carbon sinks for Madagascar, contributing to global climate regulation. Implemented by the Malagasy government, the REDD+ Project "Atiala Atsinanana", or Eastern Rainforests, coordinates the sale of carbon credits. 6,235,720 ha of forested landscapes are covered by the program.

Carbon emission reduction in the "Eastern rainforests" zone involves several measures: improved management of forest areas, expansion of intervention zones in areas of no activity, optimization of various production systems and agricultural and livestock infrastructures, as well as improved wood energy production through improved cooking stoves and promotion of renewable energy. The promotion of reforestation and the restoration of degraded forest areas with the development of agroforestry is also a lever for increasing the carbon stock in the program.

The initiative contributes to the country's commitment to the Paris Agreement through the Nationally Determined Contributions (NDCs) through a 14% emission reduction target for the forestry sector.

Generated by our modern way of life, global greenhouse gas (GHG) emissions (including carbon dioxide or CO2) associated with fuel consumption and massive forest degradation, are causing global climate disruption. Some phenomena are becoming more and more frequent: heat waves, fires, torrential rains followed by floods and cyclones, and drought.

Protected areas with healthy forests remain a natural solution to capture dioxide and store carbon.

Mangroves, peatlands, seabeds, reefs, seagrass beds, wetlands, and moist and dry forests all have the capacity to absorb and store carbon and are preserved in protected areas.

⁴³ USD 200 billion
⁴⁴ MGA 10,000

The carbon market makes it possible to monetize this forest storage capacity in the form of carbon credits for purchase by polluting entities/countries through the REDD+ (Reducing Emissions from Deforestation and Forest Degradation - Phase 2) mechanism.

If protected areas are properly preserved from deforestation and the national REDD+ program is fully developed, the 3.4 million hectares of forest in these areas could generate significant funding for development projects benefiting the local communities in return for their support to protected areas.



5. OUR PROTECTED AREAS, SANCTUARIES OF SACRED SITES IN MADAGASCAR

Many sacred and historic sites are found and preserved in protected areas. Unfortunately, not all culturally important places benefit from the protection of a protected area.

Inestimable in monetary terms, the cultural values of protected areas is certainly among the values most cherished by the Malagasy people.

Sacred links between Malagasy ethnic groups and protected areas, some examples

Antrema Protected Area (North-East Madagascar) was created in response to a request from the local population, including the royal family, to protect the lemur *Propithecus coronatus*, considered by the Sakalava Marambintsy ethnic group as the reincarnation of their ancestors.

One of the caves of **Ankarana** protected area (North of Madagascar) was used as a tomb for the royal family of the Antakarana tribe. This tribe had taken refuge in the heart of the mountainous massif to flee the attacks of those in the highlands in the 19th century. Ceremonies and festivals are still held there periodically.

Last residence of the Bara, the sacred forests of **Analavelona** and **Zombitse-Vohibasia** protected areas still host funeral rites.

Marojejy National Park (eastern Madagascar) continues to host traditional rituals (Joro, the turning of the bones, etc.) and burial sites. Marojejy means «many spirits,» as the ancestors of the inhabitants believed that the mountain range is populated by the souls of the dead.



Traditional Bara coffin in the protected area of Isalo (MNP) © MNP

6. OUR PROTECTED AREAS PROVIDE PLANTS FOR TRADITIONAL MEDICINE

Protected areas contribute significantly to the well-being and especially the health of local populations. In contrast, destruction of natural ecosystems puts people and livestock at risk of disease.



Healthy environment

It is well-known that Protected areas provide better health for children living nearby. Children living in the peripheral zones of protected areas typically have growth indicators, including height-to-age ratios, that are close to normal. A study⁴⁵ conducted in 35 countries, including Madagascar, found that natural ecosystems in protected areas provide better living conditions for people: clean air, clean water and micronutrient-rich food.

Source of remedies

Protected areas are a source of remedies for the Malagasy people. They shelter plants whose medicinal virtues are transmitted from one generation to another. For example, infusions based on endemic aromatic plants are prescribed against fatigue or muscular pains like katrafay (*Cedrelopsis grevei*). In case of gastritis, ulcers or superficial wounds, people use the antioxidant properties of aloes, including vahona (*Aloe macroclada*) sold at street corners in many towns. The populations near the protected areas are privileged, because they have easier access to these medicinal resources.

⁴⁵ Herrera D, Ellis A., Fisher B, Golden C D, Johnson K, Mulligan M, Pfaff A, Treuer T, Ricketts T H (2017). Upstream watershed condition predicts rural children's health across 35 developing countries. Nature Communications. DOI-10.1038/s41457-017-0075-2.

Zoonotic Disease Risk Prevention

Deforestation leads wild animals to leave their natural habitats and move closer to communities. This proximity between wildlife and humans tends to increase the occurrence of zoonotic diseases, i.e. the risk of diseases transmitted from animals to humans. Malaria and respiratory diseases as well as epidemics/pandemics such as dengue fever or plague are all examples. Covid-19, the latest example, is believed to originate from wild animals. By preserving forests, protected areas help prevent the spread of parasites, bacteria and viruses to human communities and their livestock.





7. OUR PROTECTED AREAS ATTRACT A SIGNIFICANT NUMBER OF TOURISTS TO MADAGASCAR

Contribution of protected areas of Madagascar to the tourism sector

→ Ecosystem services

Conservation of biodiversity, including flagship species of fauna and flora

Terrestrial Protected Areas Biodiversity conservation

Lemurs, other mammals, birds, reptiles, amphibians, flora

Marine Protected Areas Biodiversity conservation

Coral reefs, reef fish, whales, whale sharks, sea turtles, mangroves

→ National economic contribution

**USD 42-174 million/year, or
USD 38-156/ha/year⁴⁶**

USD 5.3 million/year⁴⁷
Contribution of coral reefs in marine protected areas to tourism

→ Beneficiaries

2,000 direct and indirect jobs related to the management of the 34 protected areas of tourist importance managed by MNP in 2019
Local tourism stakeholders (restaurant owners, hotel operators, guides, transporters, etc.)
Malagasy state (taxes)



Coral reef in the protected area of Nosy Tanikely (MNP) © World Bank



Local tourism inside Andasibe protected area © MNP

Tourism contributes about 13% to the GDP of the country. As a source of foreign currency and job creation, the tourism sector, especially ecotourism, is vital for the country's economy. A 2012 survey found that 68% of foreign tourists aim to visit at least one protected area to discover the endemic and exceptional fauna and flora found on the island. Biodiversity is thus the major attraction of international tourism in Madagascar.

Marine and terrestrial protected areas, as refuges for native species, offer tourists the unique experience of seeing them in their natural habitats. Although ecotourism is currently focused on 15 of the 43 sites in the MNP network, the new protected areas and community reserves have real potential to add a community and cultural dimension to the ecological experience.

Developing our protected areas is a source of growth for the local communities, but also for the entire national economy.

⁴⁶ MGA 170 - 690 billion/year or MGA 150,000 - 620,000/ha/year - Basis of calculation: 68% of tourists visit at least one protected area; Income generated by jobs created; direct income from ecotourism and park visits (taxes, entrance fees, guides, etc.) for the 15 most popular protected areas in MNP covering 1,113,981 ha and receiving about 227,000 visits/year; expenditure in the national economy during the visits; investment in the creation of tourist reception structures

⁴⁷ MGA 20 billion - Basis of calculation: revenues related to protected area coral reef tourism; daily expenditures of tourists visiting the Ankarea site to see sharks; tourism revenues generated by Nosy Tanikely

FOCUS 5. NOSY TANIKELY MARINE PROTECTED AREA

Small marine gem with an exceptionally high economic value

Marine protected areas are as important economically as terrestrial protected areas. Coral reefs, white sand beaches and underwater biodiversity, among other things, attract ecotourists to these areas. Among the 14 marine protected areas managed for tourism, the most popular is Nosy Tanikely, a small island near Nosy-Be, with up to 50,000 visitors per year.

In 1968, Nosy Tanikely became the first marine reserve of Madagascar entrusted to the Ministry of Transport and Equipment, because of the lighthouse located on the island. In 1995, a municipal decree set its area at 100 ha. In 2008, Nosy Tanikely was integrated into the national system of protected areas with a total area of 341 ha, define as circle with a radius of 1 km around the lighthouse.

Its terrestrial component is covered with forests, of about 10 ha. The coral reefs that surround it are spread over about 50 ha. An exceptional diversity consisting of over 110 species of corals and over 154 species of fish is found there. Nosy Tanikely was identified in 2002 as one of the richest sites in marine biodiversity in northwestern Madagascar.

Nosy Tanikely is the number one tourist attraction in Nosy Be which, according to MNP data, recorded 38,472 foreign tourists and 13,813 nationals in 2019. Apart from the entrance fee, the island plays an important role in the tourist economy of the island. Assuming that each visitor spends at least one night in Nosy Be, with a local daily expenditure per tourist of at least USD 55⁴⁸ per day, Nosy Tanikely directly generates at least USD 2.42 million⁴⁹ in revenue per year for the local and national economy. This translates into an annual yield of approximately USD 7,088⁵⁰ per hectare, the highest value per hectare of all the protected areas in Madagascar.

48 MGA 220,000

49 MGA 10 billion

50 MGA 28.17 million

8. OUR PROTECTED AREAS GENERATE ADDITIONAL INCOME FOR LOCAL COMMUNITIES

Contribution of protected areas to the conservation economy

→ Ecosystem services

Biodiversity conservation

→ Economic contribution at the national level

USD 52-60 million/year⁵¹

→ Beneficiaries

Civil society organizations (CSOs) and communities
Government of Madagascar

Biodiversity conservation funding that flows into Madagascar supports an entire economic sector. For example, conservation, restoration and monitoring activities contribute to job creation.



Nursery farmers in the protected area of Agnalazaha (MBG) © MBG

51 MGA 210-240 billion - Basis of calculation: Total of actual investments in biodiversity conservation in Madagascar (international public funding including GEF7, PADAP, NGOs and FAPBM, government expenditures, bioprospecting revenues)



9. OUR PROTECTED AREAS HAVE GLOBALLY UNIQUE SPECIES AND GENETIC DIVERSITY

Contribution of protected areas to the conservation of genetic resources

→ Ecosystem services

Conservation of genetic resources

→ Economic contribution at the national level

USD 284 million/year⁵⁴

according to a World Bank estimate in 2010

USD 460,000 actually earned over 5 years according to a recent study⁵⁵

→ Beneficiaries

Malagasy State and communities



Use of medicinal plants in Agnalazaha (MBG) © Volana Razafimanantsoa

Biodiversity itself can have a measurable economic value as a source of bioactive compounds (genes, molecules, etc.). Bioprospecting consists in conducting research on these natural active compounds to develop pharmaceutical, cosmetic, hygiene products, etc. One third of the pharmaceutical products used in the world have been found by bioprospecting plants or natural substances⁵². Derived from the rosy periwinkle of Madagascar, the anti-cancer drugs vincristine and vinblastine have been used since the 1960s⁵³. Marine and terrestrial protected areas, as a reservoir of flora and fauna, host bioprospecting centers.

Bioprospecting in protected areas generates income in many ways. On the one hand, the research carried out in the field directly benefits local communities through services related to the bioprospecting research, but above all by monetizing traditional knowledge on the natural properties of the plants. On the other hand, these same communities, and the country as a whole, could potentially claim royalties from the production of derived products.

While the revenue generated by bioprospecting may seem modest, the real cost avoided by conserving protected areas is the loss of genetic resources. This loss will be detrimental to future generations and will require them to deploy more resources to develop solutions.



Landscape of the protected area of Tsimanampetsotse (MNP) © MNP

54 MGA 1,130 billion WB estimate: USD 400 million with an assumption of 71% in the PAs - Ollivier T and Giraud PN 2010. Costs of Environmental Degradation and the Sustainability of Madagascar's Development Pathway. Antananarivo : World Bank. MGA 1.83 billion - Jones

55 JPG, Rakotonarivo OS and Razafimanahaka JH, in press. Terrestrial conservation in Madagascar: past, present and future. In: Goodman in press. Princeton University Press.

52 Ollivier T and Giraud PN 2010. Costs of Environmental Degradation and the Sustainability of Madagascar's Development Pathway. Antananarivo : World Bank.

53 Ollivier T and Giraud PN 2010. Costs of Environmental Degradation and the Sustainability of Madagascar's Development Pathway. Antananarivo : World Bank.



Landscape of the protected area of Ranomafana (MNP) © MNP

FOCUS 6. RANOMAFANA NATIONAL PARK

Bioprospecting in Ranomafana⁵⁶

A bioprospecting contract was signed in 2005 for Ranomafana Park between the International Cooperative Biodiversity Group (ICBG), several national technical institutions and two local associations. The contract amount is USD 260,000⁵⁷ over 4 years for investments as well as in-kind benefits.

«The various local partners, including the local communities, have enjoyed direct benefits, in addition to the sharing plan developed in consultation with all stakeholders. Under this plan, the communities are paid royalties in the same proportion as the other local partners, in exchange for their contribution in providing traditional knowledge about the plants. Immediate benefits of the Ranomafana contract are more of a socio-economic nature, but also involve ecological aspects. Local biodiversity conservation projects have been carried out in collaboration with local communities, through the funding of bioprospectors [which amounted to USD 260,000 over 4 years]. If the conditions for equitable sharing are respected and if the monetary benefits are really allocated to the financing of community projects, the ICBG-Ranomafana contract should eventually be an exemplary bioprospecting agreement,» according to RAHARINIRINA Baomiatotse Vahinala in her PhD dissertation.

56 PhD dissertation by RAHARINIRINA Baomiatotse Vahinala in 2009, Economic valuation of biodiversity through bioprospecting contracts and the essential oils sector: The case of Madagascar, 2009.

57 MGA 1.03 billion



10. OUR PROTECTED AREAS PROJECT A POSITIVE IMAGE OF MADAGASCAR

The unique biodiversity of the island inspires and arouses major names in cinema, whether for documentaries or fictional films. The protected areas regularly welcome photographers and filmmakers from all over the world. These film or photographic productions contribute to the economy in two ways: through the expenses incurred locally during filming and through the promotion of the destination abroad. If the first is quantifiable, part of the direct revenues generated by the films are still not paid back to Madagascar. Moreover, the effective contributions of audiovisual productions to the promotion of tourism are not yet measurable.



Floating bridge in Bemaraha National Park MNP © MNP

FOCUS 7. AUDIOVISUAL PRODUCTIONS IN MADAGASCAR

BBC nature documentaries

The BBC and its partners, through the BBC's Natural History Film Unit, and other leading filmmakers have devoted 70 documentary films to Madagascar's biodiversity since 1961 (66 since 1980, or 1.65 films/year). The median production cost has been estimated by BBC experts at USD 250,000/documentary⁵⁸, of which about 25% is spent in Madagascar during filming (USD 103,125⁵⁹/year on average).

58 MGA 993.75 million
59 MGA 409 billion



5 CONTRIBUTIONS OF OUR PROTECTED AREAS AT THE GLOBAL LEVEL

Landscape of the protected area of Tsimanampetsotse (MNP) © MNP



1. OUR PROTECTED AREAS HELP REGULATE GLOBAL CLIMATE

Protected areas contribute significantly to the fight against climate change. **Natural forests are up to 40 times more effective than plantations and six times more efficient than agroforestry in absorbing and storing carbon. Mangroves have the capacity to absorb up to four times more carbon dioxide per hectare than terrestrial upland forests because of the very high carbon accumulation in mangrove soil⁶⁰.** In the vicinity of protected areas, reforestation and agroforestry could provide additional income and sources of weed for local people while helping to protect the natural forests.

The overall value of Madagascar's protected area network for climate regulation through terrestrial forests is estimated at USD 5.9 billion annually⁶¹, mainly through rainforests. The contribution of mangroves is estimated at USD 312 million/year⁶². The estimates are also based on the key assumption that Madagascar will successfully prevent deforestation in its protected areas. On average, deforestation rates are much lower in protected areas than outside them but are not yet zero.



2. OUR PROTECTED AREAS CONSERVE GENETIC WEALTH

The global value of the genetic resources conserved in Madagascar's protected areas is estimated at USD 299-809 million/year⁶³.

Extracts alone (vinblastine and vincristine) from the Madagascar rosy periwinkle *Catharanthus roseus* generate about USD 100 million⁶⁴ per year. More Malagasy species with bioactives remain to be discovered.



3. OUR PROTECTED AREAS CONSERVE WORLD HERITAGE

With at least 3% of the world's biodiversity, Madagascar's protected areas has significant potential to reduce the risk of global species extinction for birds, mammals and amphibians.

With 71% of the KBAs in the SAPM⁶⁵ network, protected areas contribute to more than 50% of the STAR⁶⁶ indicator rating for the country⁶⁷.

The global economic contribution of Madagascar's protected areas to biodiversity conservation is estimated at between USD 572 and 660 million/year⁶⁸.

60 Donato et al 2011 ; Hua et al 2022
 61 MGA 20,000 billion
 62 MGA 1,240 billion
 63 MGA 1,190 - 3,220 billion
 64 MGA 400 billion

65 Neugarten et al 2020
 66 Species Threat Abatement and Restoration indicator: Percentage of total population of a species at the site of interest (P) × IUCN Red List category weighting of species (W) × relative contribution of each pressure (R)
 67 Mair et al 2021
 68 MGA 2,270 and 2,620 billion

This figure assumes a willingness on the part of the international community to devote 0.4%⁶⁹ of current global spending on biodiversity conservation (which currently ranges from USD 124 to 143 billion/year⁷⁰) to Madagascar's protected areas.

4. OUR PROTECTED AREAS CONTRIBUTE TO GLOBAL ECOTOURISM

The biodiversity conserved in the SAPM generates extra consumption by ecotourists worldwide. In addition, the entire upstream global ecotourism value chain (airlines, tour operators, advertisements, etc.) benefits from Madagascar's ecotourism.

Total foreign spending upstream or downstream of stays in Madagascar is estimated at between USD 538 and 548 million/year⁷¹. A significant portion of this value comes from terrestrial protected areas and endemic species such as lemurs and birds, that tourists come to see.

5. OUR PROTECTED AREAS CONTRIBUTE TO SCIENTIFIC RESEARCH

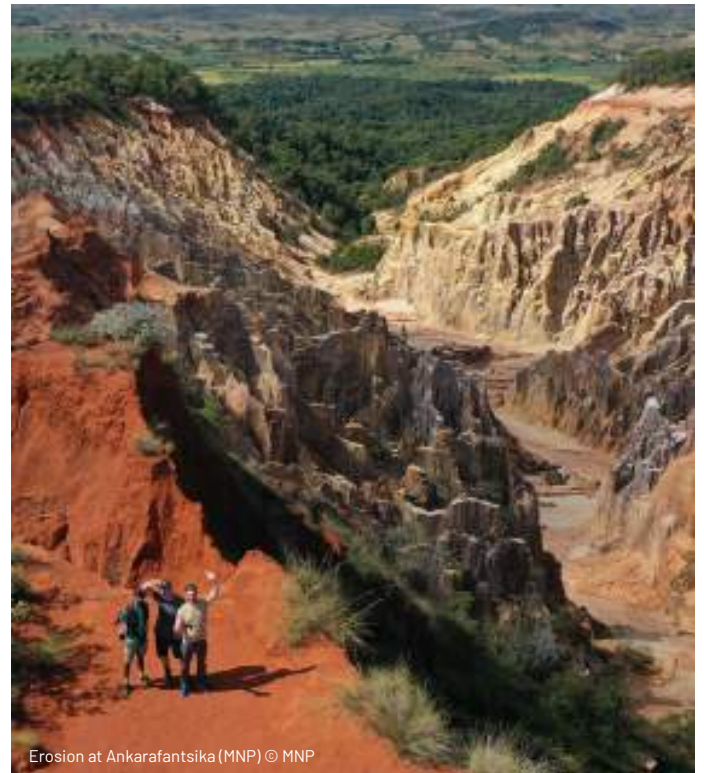
There have been more than 25,866 scientific publications on Madagascar's biodiversity since 1990. With an estimated investment of USD 10,000⁷² per publication, the total investment is USD 252 million⁷³, or USD 8.34 million per year.

This is only a rough estimate, as it does not take into account the research grants awarded, which can reach hundreds of thousands of dollars. There is no doubt, however, that the biodiversity of Madagascar's protected areas generates significant economic contributions in the research sector.

6. OUR PROTECTED AREAS INSPIRE AUDIOVISUAL PRODUCTIONS

Natural history filmmaking in Madagascar involves estimated international expenditures of USD 412,500⁷⁴ per year, assuming an average production cost of USD 250,000 per production and 1.65 films per year. This figure is conservative, as it only includes films made by the BBC Natural History Film Unit or BBC associated groups.

Media productions inspired by the biodiversity of Madagascar's protected area network generate an estimated USD 88 million⁷⁵ per year, based on the Dreamworks animated series *Madagascar* alone.



Erosion at Ankarafantsika (MNP) © MNP

69 Basis of calculation: Global biodiversity expenditure x 3% share of global biodiversity located in Madagascar x 71% of this biodiversity found in protected areas globally x 20% of actual and needed biodiversity expenditure generally spent on protected areas.

70 MGA 490,000 to 570,000 billion

71 MGA 2,140 and 2,180 billion

72 MGA 39.75 million

73 MGA 1,000 billion, or 30 billion/year

74 MGA 1.64 billion - average production cost of MGA 993.75 million

75 MGA 350 billion

6

COSTS AND RESOURCES REQUIRED TO OPERATE OUR PROTECTED AREAS

1. MANAGEMENT COSTS VS. ECONOMIC CONTRIBUTION

Creating protected areas is not enough, it is important to find the material, human and financial means to ensure sustainable management.

Management costs of protected areas include administrative expenses, conservation activities and financial sustainability of the overall protected areas network, excluding community development activities which are essential in an economically impoverished such as Madagascar.

Total management costs of the network are estimated at nearly USD 76 million/year⁷⁶ for the 123 protected areas of Madagascar. This cost of USD 76 million/year compared with the national economic benefits estimated between USD 410 and 528 million/year⁷⁷, make protected areas a very good investment.

MPA management costs vary, but are often less expensive than terrestrial areas. This is likely due to the large size of MPAs (100,000 ha on average) and the type of management that focuses on sustainable resource use rather than strict conservation.

How much does it cost to manage protected areas?

All protected areas:

- USD **6.06**/ha/year⁷⁸ according to the World Bank estimate (2015 cost projection)⁷⁹
- USD **10**/ha/year⁸⁰ according to the study's estimate based on FAPBM and MNP data (2021)

Marine protected areas:

- USD **0.46 to 2.26**/ha/year⁸¹ of MPA management costs globally in 2004
- USD **4.54 to 8.72**/ha/year⁸² of MPA management costs in Madagascar in 2017



2. POTENTIAL FINANCIAL RESOURCES TO BE MOBILIZED

Aware of Madagascar's biological wealth, countries and organizations actively involved in conservation are multiplying funding for biodiversity in Madagascar. Madagascar's commitments to various global international conventions (Ramsar 1971, CITES 1973, Bonn 1979, Rio conventions 1992, etc.) or regional conventions (Africa Convention 1968, Nairobi convention of 1985) have also favored investments in protected areas. Respecting and complying with these international commitments helps to mobilize more international funding.

The study on the economic values of Madagascar's protected areas shows that Madagascar receives **between USD 52 and 60 million⁸³** annually for biodiversity conservation including protected areas. Yet, their maintenance represents a global contribution of **USD 572 to 660 million/year⁸⁴** through the conservation of global biodiversity.

76 MGA 300 billion

77 MGA 1,630 and 2,100 billion

78 MGA 20,000

79 Agreco 2012

80 MGA 40,000

81 MGA 1,828 to 10,000 - Balmford A, Gravestock P, Hockley N, McClean C & Roberts C, 2004. The worldwide costs of marine protected areas. Proceedings of the National Academy of Sciences 101(26):9694-7. DOI: 10.1073/pnas.0403239101.

82 MGA 20,000 - 30,000 - Lyer 2017

83 MGA 210 - 240 billion

84 MGA 2,270 - 2,620 billion

7

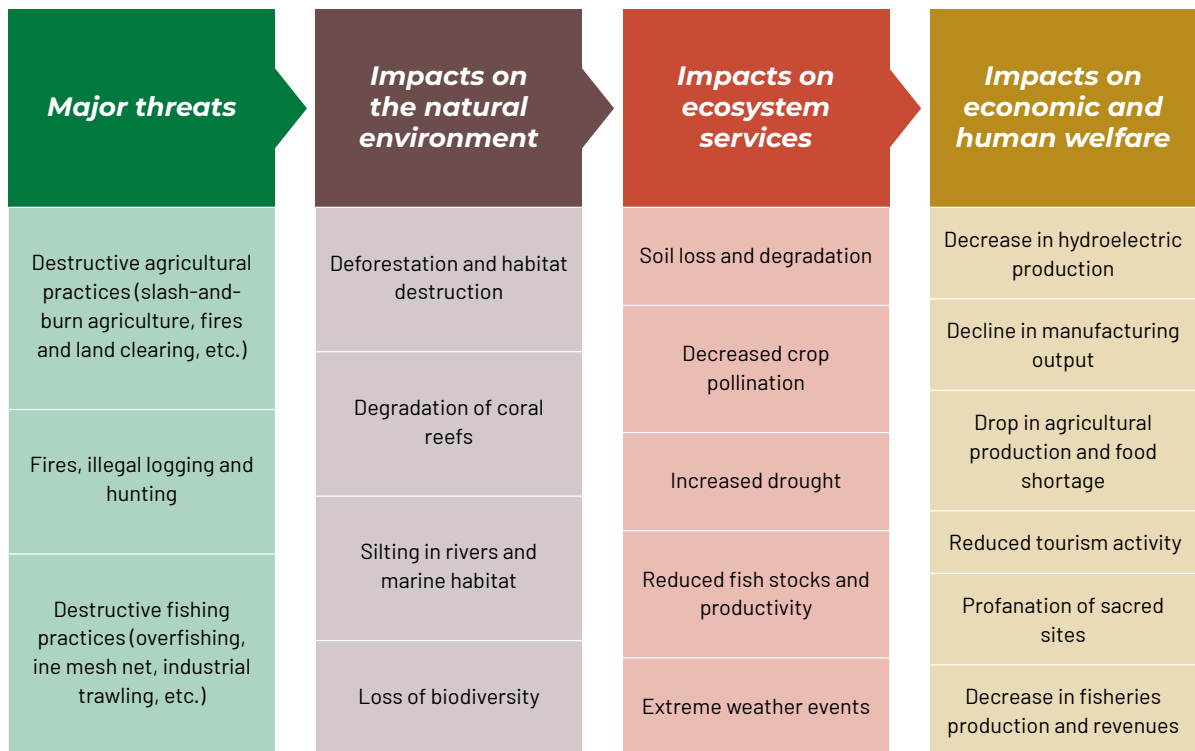
RECOMMENDATIONS FOR MAKING THE MOST OF OUR PROTECTED AREAS

Based on 2018 data, a recent World Bank study estimates that the current rate of nature loss in Madagascar will result in an annual GDP loss of 19.9 percent by 2030. The loss of natural areas would reduce the output of ecosystem-dependent sectors by 23%, including agricultural production by up to 33%, and completely reverse GDP growth.

Our call to action is ambitious but it is essential to lay the foundation for a government recognition of, and subsequent implementation of conservation strategies for maintaining, the economic and social benefits of protected areas.

Declines in these ecosystem-dependent sectors will result in losses of 55% in manufacturing and 19% in services.

What actions can we take to ensure that Madagascar's unique biodiversity continues to be protected and benefit present and future generations?



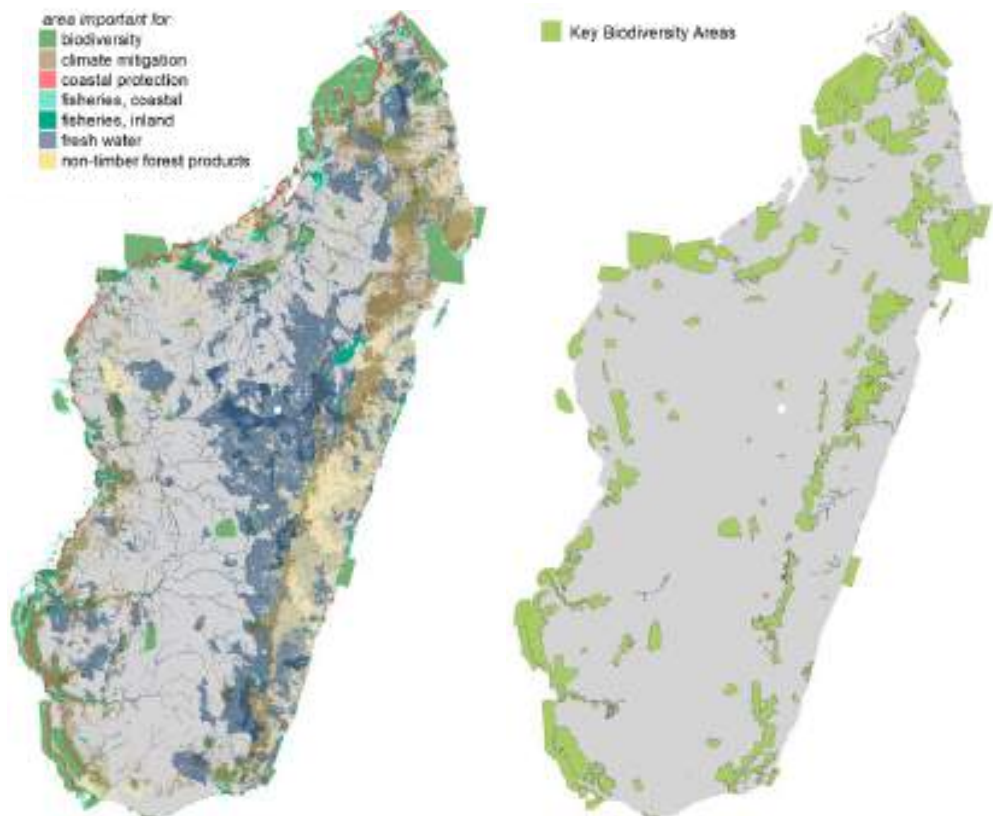


1. MAINTAINING AND STRENGTHENING OUR PROTECTED AREAS

Protecting Key Biodiversity Areas (KBAs): Wherever nature provides vital services for development, it must be protected. There are currently 233 KBAs identified by the International Union for the Conservation of Nature (IUCN) and its partners. Extending the SAPM to include more of these KBAs would help preserve these sites from pressures and threats while helping to maintain the provision of ecosystem services to the neighboring populations.

Madagascar's important natural capital, and KBAs and potential for expanding protected areas

(Source: Neugarten et al 2015)



Developing an ambitious strategy for the SAPM: The evolving national strategy for the protected area system defines Madagascar's national vision and perspectives for biodiversity protection, outlining the challenges of biodiversity depletion at the local, national and global levels. It will guide the priorities of national sector stakeholders and set the country's position on international priorities: protecting 30% of the planet, restoring ecosystems, and building community leadership. The strategy should take into account:

- **Integrating the economic contribution of protected areas into national accounting** to enable decision makers to (i) understand the risks of biodiversity depletion on the private sector and social welfare; (ii) make informed decisions on long-term sector strategies;

- **Developing a multisectoral strategy by improving existing intersectoral agreements** (such as Mining-Environment, Fisheries-Environment, Tourism-Environment) and taking into account the new sectors to be integrated;
- **The setting up of an environmental and local management framework for protected areas:** All protected areas should have a standard environmental and social management system to ensure that conservation activities do no harm and ensure adequate compensation, for losses suffered by local communities.

Strengthening advocacy with the Nation's major actors: Raising awareness of the importance of our protected areas as well as promotion of sustainable practices that nourish harmony between humans and nature remains a challenge in Madagascar. Information, Education and Communication (IEC) activities on the values of protected areas should be strengthened. In speaking to the outside world, Madagascar should highlight and capitalize on its success stories.

Call to action for various sectors - key strategies for consideration

Water • Maintaining wetlands through ecological restoration activities and including major water use users in the conservation of ecosystem services; and Encouraging the integration of priority wetland sites into the SAPM.

Energy • Promoting sustainable charcoal production techniques, advocating for community-based incentives for watershed preservation; and partnering with the private sector to institute an insurance scheme for farmers, including cover for supporting landscape restoration focusing on reforestation and climate-smart agriculture.

Land use planning • Integrating ecosystem services of protected areas into communal and regional plans to ensure proper allocation of protected area zones and boundaries with full awareness of the issues at stake.

Mining • Reducing the impacts of extractive exploration and exploitation on natural habitats, in order to achieve at least a net-zero negative impact and preferably a positive impact on social welfare and biodiversity; and Developing financial mechanisms to transform non-renewable extractive resources into funds for sustainable development and biodiversity conservation.

Food & Agriculture • Designing policies that encourage sustainable land use and protect land cover, such as payment for ecosystem services; engaging in holistic land management plans that provide space for wildlife, allow for pasture regeneration, and accumulate grass to mitigate drought; and engaging in reforestation activities that prevent landslides.

Fishing • Securing sustainable fishing partnership agreements in favor of small-scale fishermen.

Tourism • Adopting a sustainable tourism model; Implementing income redistribution guidelines for community conservation activities; advocating for improved status of protected areas; and participating in efforts to integrate small-scale farmers into the tourism sector in order to open new markets for their products.

Economy & Industry

- Supporting strategies related to payments for ecosystem services; and Ensuring responsible provisioning, production and consumption, tracking the traceability of raw materials and finished products to ensure that natural resources in protected areas are free from illegal trafficking.

Justice and defense

- Appropriate enforcement of environmental laws by ensuring the necessary means to (i) carry out monitoring, control and all forms of intervention; (ii) to fight corruption, apply the laws, serve justice, and denounce pressures and threats to ecosystem services.



Peak of Ivohibe (MNP) © MNP



2. IMPLEMENTING SUSTAINABLE FUNDING SOLUTIONS

Subsidizing the operation of protected areas: The government should send a strong signal of its commitment to the protection of biodiversity by providing annual subsidies for the operation of protected areas, within its budget. These subsidies would complement the support provided by FAPBM, and various donors, to finance the operating expenses of part of the protected areas in the Madagascar National Parks network and the NPAs.

Engaging more strongly with global sustainable financing initiatives and major donors: The global value of Madagascar's biodiversity is well established and the capacity of protected areas, if properly managed, to address global priorities is easily demonstrated. Madagascar ranks with Mexico and Costa Rica in terms of biodiversity wealth. In these countries, protected areas are strongly supported by international funds, as the structures put in place ensure effective impacts. The Malagasy government and all stakeholders (trust funds, NGOs, protected area managers) must therefore develop large-scale, relevant programs and projects, in a collaborative spirit, in order to establish partnerships and respond to international calls for proposals.

Madagascar's sustained presence and voice in global forums could provide stronger advocacy for an increased international contribution that is proportional to the global benefits that Madagascar's protected area network brings. Madagascar has the capacity to mobilize greater international private and mixed funding given the high returns in extinction risk reduction that it can offer.

Adopting innovative financial solutions: Innovative solutions exist to address the challenges of sustainable financing of protected areas. Here are some examples from other countries that Madagascar could adapt to its context:



3. ACTING FOR THE BENEFIT OF LOCAL COMMUNITIES

Setting up mechanisms to equitably redistribute benefits to communities: Equitable redistribution of the benefits generated by conservation, despite the undeniably insufficient revenues from protected areas, is essential to gain community support for conservation. In MNP areas, a portion of the entrance fee is dedicated to supporting community-based activities. Unfortunately, there are constraints that sometimes prevent this from happening. Reforestation and restoration activities around protected areas can also provide employment opportunities and additional income for communities.

Engaging the private sector - a key success factor for value chains: Partnership with the private sector is essential to ensure the sustainability of the business model for income-generating activities and value chains. This means involving the private sector, from product production, to design, and to marketing.

This helps strengthen communities' productive capacity and gives companies the opportunity to benefit from products made through sustainable practices while contributing to the protection of the environment. The ultimate goal is a sustainable improvement in people's living conditions.

Building community capacity to manage protected areas: As direct beneficiaries of protected areas, it is essential to empower and involve local communities in managing them through good governance. This means supporting local people to develop their capacities and motivation to become spokespersons and primary advocates for ecosystem services. The successful models of community protected areas (LMMAs, community forest reserves) in technical and financial terms deserve to be scaled up.

Examples of innovative financial solutions

Payments for ecosystem services •

In Costa Rica, users of ecosystem services reward landowners for keeping their land in good condition. For example, water bill charges are paid to landowners for not using forests near watersheds for agriculture and livestock.

Incentive taxation •

In European countries, governments have often developed an incentive tax policy in favor of biodiversity protection e.g by not taxing donations to environmental NGOs.

Green tax • A green tax can be levied on the most polluting or environmentally damaging industries. The revenue from this tax could fund the operating expenses of protected areas.

Biodiversity Offset Funds •

Offset funding can be systematized as a last resort after the necessary avoidance, mitigation, and remediation of polluting industries has been undertaken.

Debt-for-nature swaps

• Madagascar's creditors can trade debt for a donation to fund conservation programs.

Carbon credits •

Protected areas can monetize the amount of carbon their forests capture or store to companies that wish to offset their greenhouse gas (GHG) emissions; the REDD+ program would therefore benefit from being extended to the entire SAPM in order to support forest conservation efforts. Each protected area will thus be able to mobilize carbon revenues from its conservation activities.

Climate funds • Bilateral, multilateral, public and private initiatives are funding the implementation of nature-based solutions to tackle the impacts of climate change (Green Climate Fund, Legacy Landscapes Fund, Leaders' Summit on Climate, The Land Accelerator, UN Decade on Ecosystem Restoration (2021-2030)).

Royalties in the forestry sector •

Taxes, fees, royalties and other charges should extend to the extraction, transport and/or use of wood and non-wood forest products and forestry activities (e.g., stumpage fees, concession fees, royalties based on the volume/value of wood harvested). Revenues can be used for biodiversity conservation/restoration.

Private sector funding

• Through sponsorship, CSR or environmental protection mechanisms, mandatory/voluntary private sector investments can be directed towards protected area conservation.

Specialized funds (trust and non-trust) •

In the United States, Lion Share Fund collects funds from advertisers for each use of animal images/sequences in commercials to fund conservation of wildlife, their habitats and nature in general.



Labor-intensive work to clear a canal in Krisiasy for a rice-growing infrastructure, near the protected area of Marolambo (c) MNP



Created in 2005, FAPBM is a private Malagasy trust fund dedicated to the conservation of Madagascar's biodiversity. Its mission is to support biodiversity conservation and ecosystem services by promoting and financing the expansion, creation, protection and improvement of the System of Protected Areas of Madagascar (SAPM).



MNP is a registered association under Malagasy law recognized as serving the public good. In 1991, it was mandated by the Government to manage the 43 Protected Areas of Madagascar existing at the time. MNP's mission is to create, conserve and sustainably manage a national network of Parks and Reserves, representative of Madagascar's biological diversity and natural heritage.

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This document and the main study are available on www.fapbm.org and www.parc-madagascar.com.

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