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Socio-Economic Impacts of the Protection of Natural Resources on the Population, Case of Marojejy National Park

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Abstract:- Madagascar has more than 90% of endemic animal and plant species. Unfortunately, animals and plants are threatened with extinction due to anthropogenic pressures. Consequently, actions have been taken for the survival of these species, among other things, the classification of certain areas as protected areas, including national parks. This work attempts to assess the socio-economic impacts of natural resource conservation action on the local population of Marojejy National Park. According to the bibliographical analysis and the results of the field survey in the three villages of Mandena, Manantenina and Ambohimananina, the result of the study shows that despite the food insufficiency and low income which push the local residents to exploit the natural resources, they are aware of the importance of the conservation of the park insofar as this improves their quality of life and ensures their survival on the ecological, economic and socio-cultural level. It is then with the aim of discovering the shortcomings and proposing alternatives that we decided to carry out such a study.

Keywords:- Endemic Species, Socio-Economic Impacts, Marojejy National Park, Local Populations, Natural Resources.

I. INTRODUCTION

➤ Context

Faced with various environmental problems today, such as global warming, the loss of human life through the appearance of diseases and epidemics, the loss and threat of extinction of terrestrial and aquatic animal and plant species, the stakes are considerable. This is why we think it would also be interesting to see, observe and understand this way

of life of man in relation to his environment. Social science researchers are embarking on this study through the anthropology of nature, which always wants to place man before his rights and obligations over nature.

Located in the northeastern part of Madagascar between the cities of Andapa and Sambava, the Marojejy massif is "A wonder of nature" according to Professor Henri Humbert in 1948, and it is the most prestigious on the island. Whole at the same time by its grandiose aspect, its floristic richness and especially by its intact state on almost the totality of its extent.

➤ Problem

This article, which is entitled "Socio-economic impacts of the protection of natural resources on the population, case of the National Park of Marojejy" plans to answer the question on the activities that must be undertaken, and activities likely to generate socio-economic impacts on the living conditions of the population and on the inclusive process of safeguarding the environment.

Do the benefits provided by the protection of natural resources in the Marojejy National Park meet the socio-economic needs of the local population?

➤ Goals :

The objective of the study is to take stock of the situation in the three villages bordering the park in order to provide recommendations for future conservation and development projects in the Marojejy region.

➤ *Hypotheses :*

- Food insufficiency and low income push local residents to exploit natural resources;
- The farmers are aware of the importance of conserving the park insofar as it improves their quality of life and ensures their survival.

➤ *Structure:*

- *Outline of the Article.*

Our study is divided into four complementary parts. The first deals with the theoretical framework of the study. The second deals with the method used. The third summarizes the results. Finally, the last part is devoted to interpreting the results and proposing guidelines for local development and environmental conservation.

II. DEVELOPMENT

A. Theoretical Framework

Marojejy National Park is located in the Province of Antsiranana, SAVA¹ Region. It is located in the northeastern part of Madagascar, 60 kilometers from the District of Sambava and 40 kilometers from the District of Andapa. It covers an area of 55,500 ha and is centered in the mountain range known as the Marojejy Massif which culminates at an altitude of 2,132 m. Its center is at longitude 14° 26' 06" South and latitude 49° 42' 22" East[56], between the valley of the Andronga river to the North and that of Lokoho to the South, the basin of Andapa in the west and the coastal plains and foothills in the east.

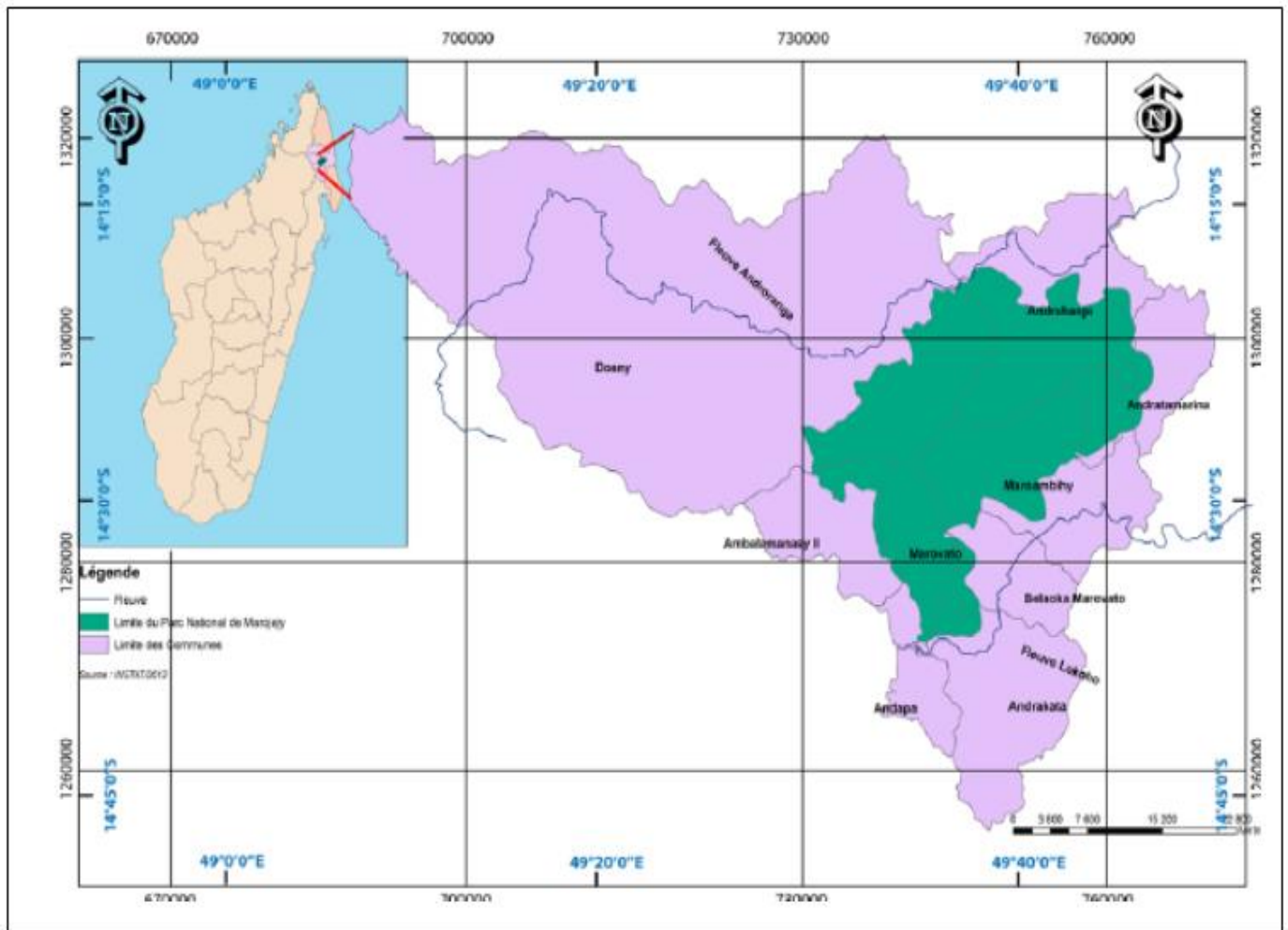


Fig1 Presentation of Communes Around Marojejy National Park

¹Ministry of Environment, Waters and Forests/ANGAP; 2003. Conservation Management Plan - Marojejy; 81 p

B. Methodology

On the one hand, the socio-anthropological approach will be deepened in order to better understand the knowledge, attitudes and usual practices of the local population vis-à-vis their relationship with nature. The main objective being the search for ways and means allowing them to know the new behaviors to adopt. For this type of method, participant observations will be prioritized to better understand the lifestyles of the population in order to be able to analyze the relationship between man and nature².

On the other hand, it turned out to be essential to know what data is available on the study area and the subject, and to clearly identify the latter. This required the consultation of numerous documents from various organizations and documentation center. Books, reviews, reports, etc. were the subject of bibliographic collections after having defined the theme. These not only make it possible to refine the problem, but also to specify the socio-economic impact of the protection of natural resources. The available data were provided by Madagascar National Parks, the “Ecole Supérieure des Sciences Agronomiques”, the library of the University of Antananarivo, the National Office for the Environment (ONE) to name a few. Cite just a few. Also, surfing the Internet helped a lot to find information likely to support the study. These bibliographic works make it possible to complete the information collected in the field. Research has mainly focused on the impacts of the creation of PAs on local communities, the state of environmental conservation, and the behaviors of communities bordering PAs, management planning and the conservation strategy of PAs. of Madagascar, the sustainable development of local PA communities and in particular information on Marojejy. In addition, the monographic, economic, social, cultural and environmental aspects have been taken into account in the field of study.

Surveys were carried out with target audiences made up of households, community leaders and the Tangalamena is communities in the peripheral area of the PA, to collect information about the realities on the spot. This information focuses on the historical context of the study sites, the characteristics of the household and the habitat, the level of education of the population, the use of the land, the economy, the dependence on the resources of the National Park, the perception of the local population vis-à-vis the Marojejy National Park and the conservation of its natural resources. The survey is a way of searching, observing, collecting, perceiving the basic data that we would like to study. This is the most important step which results in an objective study necessary for the realization of this dissertation.

The study in question concerns the Municipality of Maroambihy where the option was focused on three localities, namely: Mandena which is the village closest to the entrance to the park, that is to say at 2, 9 km from it; Manantenina which is a village located 2,7 km from

Mandena, Ambohimananarina, a village located 1,5 km from Manantenina.

The surveys were carried out at the level of the first two villages because they border the ecotourism zone of the park. Indeed, the track that leads to the entrance of the park crosses Manantenina and Mandena. Thanks to this infrastructure, many tourists and researchers pass through it and these two villages derive socio-economic benefits, including the employment of the local population in the service of the park (guide, porter, cook, etc.) and the development of trade. In addition, the Park Visitor Center is located in Manantenina. The village of Ambohimananarina is on the national road closest to the two villages mentioned above. Therefore, we believe that it also benefits from the socio-economic benefits coming from the park. That's why we chose it. In addition, the duration of the field trip was relatively short and these sites are the only ones accessible on foot while the others are too far.

The sampling was done in such a way as to have a reduced reference frame representative of the population. In this study, the survey unit chosen is the household. The sample size is 300 households for the 3 Fokontany which are the subject of the study. Household sampling is random while trying to find a good representation of the whole. We took a sample of 100 households per Fokontany.

These data will then provide the data for the construction of a database on the households surveyed (data matrix) for statistical analyzes using XLSTAT software.

C. Presentation of Results:

➤ Status of the Management of Marojejy National Park

• Historical

Marojejy was discovered in 1948 by Professor Henri Humbert, an eminent botanist from the Museum of Natural History in Paris who, after traveling through many African mountain ranges, arrived in Madagascar (ATKINSON P. and MATHIEU E, 2008). In this regard, a waterfall in the park bears his name. Between November 1948 and November 1950, he spent five months collecting a herbarium of 4,039 samples for study. After his intense field efforts and his analyzes of the specimens, he published the book "A Wonder of Nature" in 1955 in which he described the massif as being "the most impressive of all Madagascar both in size and in the diversity of its flores and its totally pristine state"³. As soon as he returned from the field, Humbert redoubled his efforts to defend Marojejy and have him classified. The massif became the twelfth and last Malagasy Integral Nature Reserve in 1952. Under this status, the reserve was prohibited from any visit except for duly authorized scientific expeditions. In doing so, it undoubtedly enabled the massif to survive population growth and the multiple anthropogenic pressures in this area. In 1998, Marojejy became the thirteenth National Park

²<http://www.marojejy.com/Pdf/2008WelcomeFr.pdf>
(26/09/2021)

³<http://www.marojejy.com/Pdf/2008WelcomeEn.pdf>
(26/09/2021)

of the island to finally allow its visit to the public. Several missions have confirmed the biological interest of the Marojejy reserve (PAULIAN, 1975) where three of the four major types of Malagasy forest ecosystems are represented: low altitude rainforest in the eastern Malagasy domain, rainforest in the Malagasy center and plant formations of the High Malagasy Mountains area. These last two formations only exist in five localities of Madagascar and it is in Marojejy that they are the most extensive and the most intact (NICOLL, LANGRAND, 1990, WWF, 1990). The massif is recognized as unique, with one of the richest biodiversity on the island. In 2007, Marojejy, within the Humid Forests of the Atsinanana, was registered on the UNESCO World Heritage List⁴ (United Nations Educational, Scientific and Cultural Organization). Due to illegal logging and trafficking of precious woods, especially after the start of the political crisis in 2009, the Humid Forests of the Atsinanana were placed on the list of World Heritage in Danger in 2010.

• *Organizations That have Managed the Park Since its Creation*

Marojejy National Park is part of the national network of Protected Areas of Madagascar, managed by MNP. According to Decree No. 66-242 of June 1, 1966, Marojejy was classified as an Integral Nature Reserve under the management of the Waters and Forests Department, through the Head of the Reserve. Its status was changed to National Park⁵ on May 19, 1998 by Decree No. 98-375. The park touches the Urban Commune of Andapa and 8 other Rural Communes, namely Andrahanjo and Andratamarina in the North, Maroambihy, Belaoka Marovato and Andrakata in the East, Doany, Ambalamanasy II and Marovato in the West⁶. The peripheral zone of the park has 64 Fokontany, belonging to 8 Rural Communes to which must be added those of the Urban Commune of Andapa.

• *The Botanical and Biological Specificity of the Park*
Floristically, Marojejy National Park contains:

- ✓ 305 species of pteridophytes, 6 of which are endemic, have been inventoried on the eastern slope of the Marojejy massif. This places the park at the forefront of Malagasy Protected Areas by its specific richness in pteridophytes⁷.
- ✓ More than 50 palm species have been inventoried, some of which are endangered and have extremely low populations. They are particularly abundant in lowland forests but remain present up to the summit⁸.

⁴<https://whc.unesco.org/fr/list/> (29/09/2021)

⁵<http://www.marojejy.com/Pdf/2008WelcomeFr.pdf> (26/09/2021)

⁶Ministry of Environment, Waters and Forests/ANGAP; 2003. *Conservation Management Plan - Marojejy* ; 81 p.

⁷<http://www.marojejy.com/Pdf/2008WelcomeFr.pdf> (26/09/2021)

⁸Op Cit (26/09/2021)

There are 4 fundamental types of forest on the whole massif (GARREAU JM.; 1997):

- ✓ Dense moist evergreen forest at low altitude (less than 800 m):
- ✓ Tropical montane rainforest (between 800 m and 1,400 m):
- ✓ High mountain dense sclerophyllous forest (between 1,400 m and 1,800 m):
- ✓ Montagnard thicket or ericoid bush (more than 1,800 m):

The richness of species of mammals, birds, reptiles and amphibians shows the singularity of the biodiversity of the Marojejy National Park (Ministry of the Environment, Waters and Forests/ANGAP; 2003):

Mammals: Marojejy harbors many species of mammals including:

- ✓ 25 species of non-flying micromammals including 14 Lipotyphla and 11 Rodentia, with 1 endemic species of the Voalavo gymnocaudus massif⁹;
- ✓ 11 species of lemurs¹⁰ including the Silky Sifaka called Simpona malandy which is endemic to the region of Marojejy and Anjanaharibe-Sud;
- ✓ 15 species related to tenrecs;
- ✓ 7 endemic species of rodents, including the fossa (Cryptoproctaferox).

Birds: The inventory of its avifauna has identified 118 species of birds including the Eurycère de Prévost called Siketribe which is the emblem of the park. Of these listed species, 75 (64%) are forest species. All of these forest-dependent birds are endemic species to Madagascar and they use the forest for part of their life cycle. One of these bird species is the Madagascan serpent eagle (Eutriorchisastur). It is a species of diurnal raptor, endemic and very threatened.

Reptiles, Amphibians: The diversity of reptiles and amphibians in Marojejy is rich, much more than that of the other Protected Areas of Madagascar. Marojejy alone contains 33% of the species known throughout the island. A total of 148 species of reptiles have been inventoried, of which 17 are found only in the massif, notably Brookesiakarchei and Callumnapeyrieran, which are two of the many species of chameleons. There is also the panther chameleon (Furciferpardalis), the uroplates, strange flat-tailed geckos (Uroplatus spp.). More than 60 species of amphibians have been identified, including typically northern or localized species such as Mantellamanery or Gephyromantistandroka and G. rivicola, but also species of Stumpfia or Boophis.

⁹Ibid (26/09/2021)

¹⁰Ministry of Environment, Waters and Forests/ANGAP; 2003. *Conservation Management Plan - Marojejy* ; 81 p.

➤ *Socio-Economic and Ecological Impact of Marojejy National Park*

In this part, we will see from the survey data whether the establishment of the park, that is to say the protection of the environment, has any influence on the socio-economic level in the life of the local population. The socio-economic problems faced by the local population create a strong dependence on the resources of the park. This dependence is expressed in different ways, including:

- ✓ Work in the park which, carried out as a secondary activity, can contribute to increasing the household income.
- ✓ Illegal exploitation of park resources for agriculture, food and energy, even if practiced by very few people, can cause significant damage to the park.

However, the majority of the population (97.3%) affirms that the park provides them with various advantages: ecologically, economically, socially and culturally.

This figure allows us to say that the local population is aware of the importance of the park in improving their quality of life on the condition of strengthening awareness in this area.

• *Ecological Benefits*

The population of the three Fokontany recognized the importance of the park on the ecological level and cited the main advantages provided by the latter for the surrounding regions, including rain, water to drink, clean air, water for agriculture and cool climate. These ecological values of the park were mentioned by 66.7%, 35.3%, 18.7%, 16.3% and 2% of the population respectively.

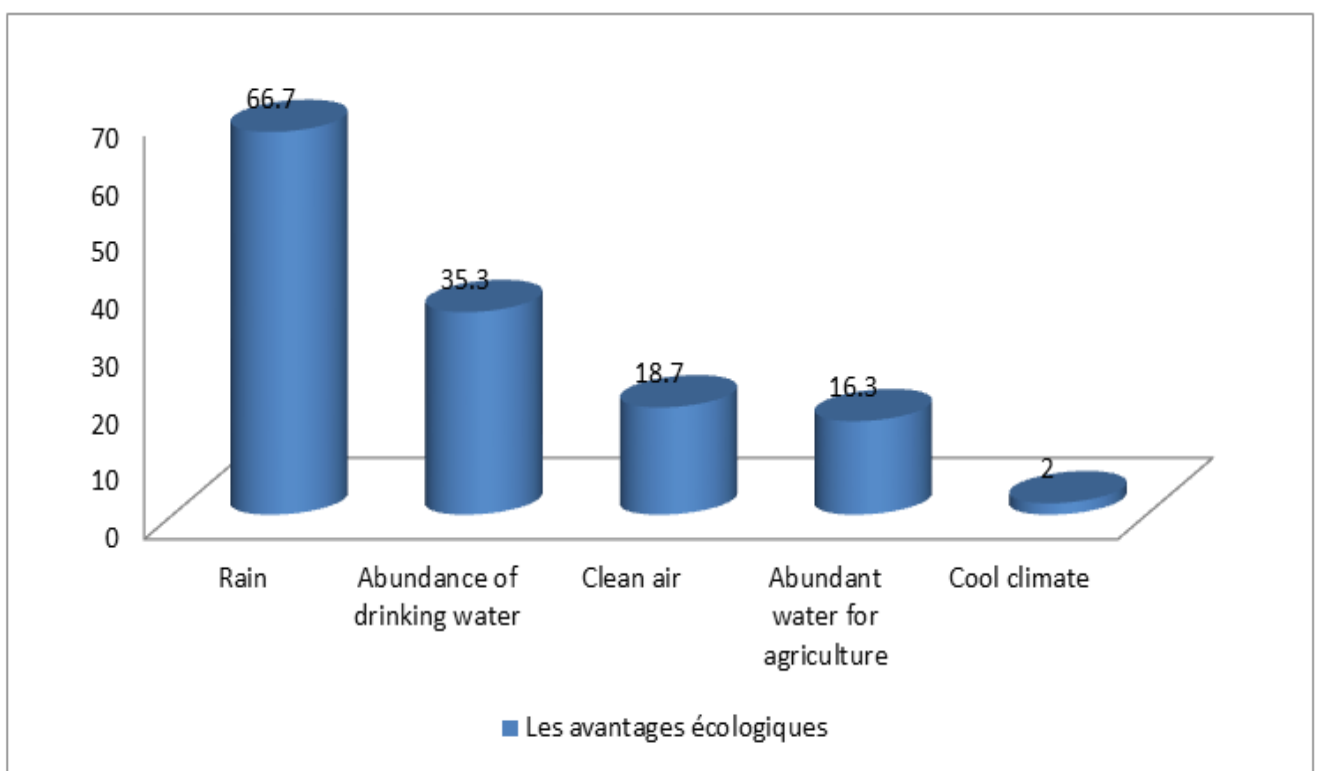


Fig 2 Distribution of Ecological Benefits Received by Households Thanks to the Park
Source: Field survey, 2021

• *Economic Benefits*

Apart from the ecological benefits, local people have claimed that the park also plays a crucial role economically. Here are the economic advantages provided by it:

- ✓ Work for women's associations, guides, porters, cooks, which was cited by approximately 49% of the population.
- ✓ Income generation cited by about 24% of the population.
- ✓ The prosperity of commercial activity cited by 15.4% of the local population.
- ✓ The development of tourism by 12% of the population.

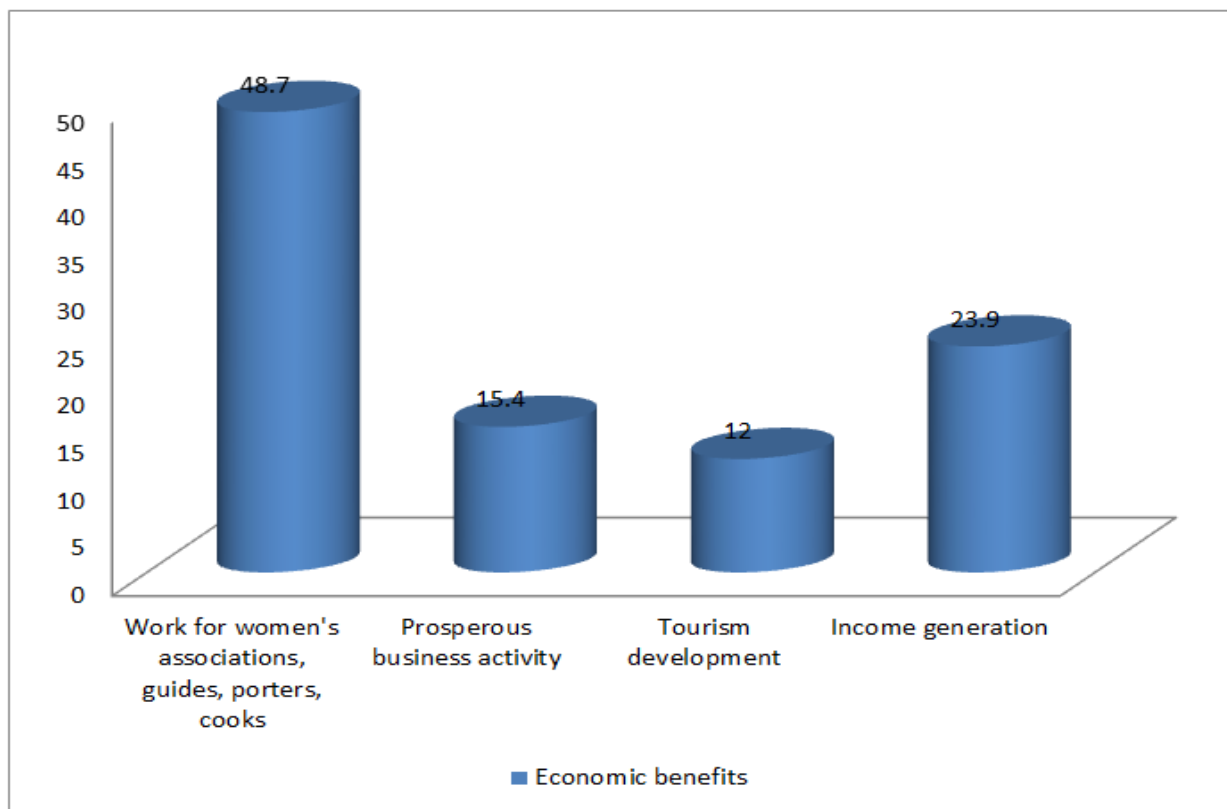


Fig 3 Distribution of Economic Benefits Received by Households Thanks to the Park
Source: Field survey, 2021

From the statistics we have collected in the field, it is clear that people who have a main activity and who also work in the park have a significantly higher income compared to those who do not work there. For example, households engaged in a commercial activity, working in the park and earning an income of less than Ar 300 000,00 per year represent only 0.3% of the total sample, whereas households engaged in a commercial activity, work in the park and earn an income between 300 000,00 and 500 000,00 Ar per year represent 1% of the total sample. Similarly, households that practice agriculture and livestock, work in the park and earn an annual income of less than Ar 300 000,00 represent only 6.7% of the total sample, while those that practice agriculture and livestock, work in the park and earn an annual income between 300 000,00 and 500 000,00 Ar represent 7.3% of the total sample. Thus we can observe from the table below that those who practice a main activity and work at the same time in the park are more numerous in the category of those who earn an income between 300,000 and 500,000 Ar per year and not in the category of annual income below 300,000 Ar.

Table 1 Impact of Park Work on Household Income

Annual revenue Ariary	Commercial activity	Commercial activity + Work in the park	Agriculture / Livestock	Agriculture/ Livestock + Work in the park	Others	employee	Health	Technician	Total
Less than 300 000,00	3,0	0,3	53,7	6,7	1,0	0,7	0,0	0,3	65,7
Between 300 000,00 and 500 000,00	0,3	1,0	9,0	7,3	0,7	2,0	0,0	0,3	20,7
Greater than 500 000,00	0,7	0,3	8,0	1,3	0,3	2,7	0,3	0,0	12,7
Total	4,0	1,7	70,7	15,3	2,0	5,3	0,3	0,7	100

Source: Field survey, 2021

Households with a member working in the park make up 17% of the total sample. These people work in the park as cooks, guides, porters or others (those who did not specify their activity within the park). In the following table, we will do a comparative study to see which of the three earns the most income per year.

Thus, within the framework of the study, we will take only the guides, cooks and porters who constitute 12.0% of the total sample. First, we noticed that porters are more likely than cooks and guides to work in the park. They represent 58.3% of those who work in the park compared to 22.2% for cooks and 19.4% for guides. According to Table XVI, we see that it is the guides and the porters who earn the most income compared to the cooks. In addition, guides are less numerous in the category of income below Ar 300 000,00 while porters are more numerous in the category of income below Ar 300 000,00 and those above Ar 500 000,00. This phenomenon is not surprising. Because guides and porters sometimes receive tips from tourists.

Economic activities in the 3 Fokontany focus mainly on agriculture and livestock which occupy 86% of the total population. Commerce occupies about 6% of the population. Employees represent 5.3% of the population. Technicians and those working in the health sector represent a total of 1% of the population. For a comparison by Fokontany, we see that there are fewer farmers in Ambohimananina. However, technicians, health personnel and employees are more numerous there. This situation seems obvious from the fact that this Fokontany is on the National Road and is rather favorable to this kind of activity.

Cash crops hold an important place in the economic life of the population of this region. In this regard, according to the latest yearbook of agricultural statistics, the SAVA Region produced approximately 3,915 T of vanilla and 6,005 T of coffee in 2008[14], which respectively represent approximately 99% and 45% of production at the level of the Province of Antsiranana. Coffee production in the region is still very low because according to the results of the survey, 81.6% of households only harvest a quantity of coffee of less than 20 kg. Households that harvest coffees over 100 kg represent only 1%.

Similarly, vanilla production for 66.3% of households is still low because it only reaches a quantity of less than 50 kg. 97.3% of households produce less than 300 kg of vanilla per year. This situation has a negative impact on the annual household income; we will analyze this situation later.

Tourism-related activities play an important role in the economy of the Fokontany surrounding the park. They are exercised by some villagers as a secondary activity. In this case, they help to increase household income, so much so that the local population demands that the number of people working in the park as guides, porters and cooks be increased. A study of the impact of the practice of tourism on household income will be conducted in the section dealing with the population's dependence on the park.

- *Socio-Cultural Impact of Marojejy National Park*
According to the local population, the park also has socio-cultural and environmental advantages:

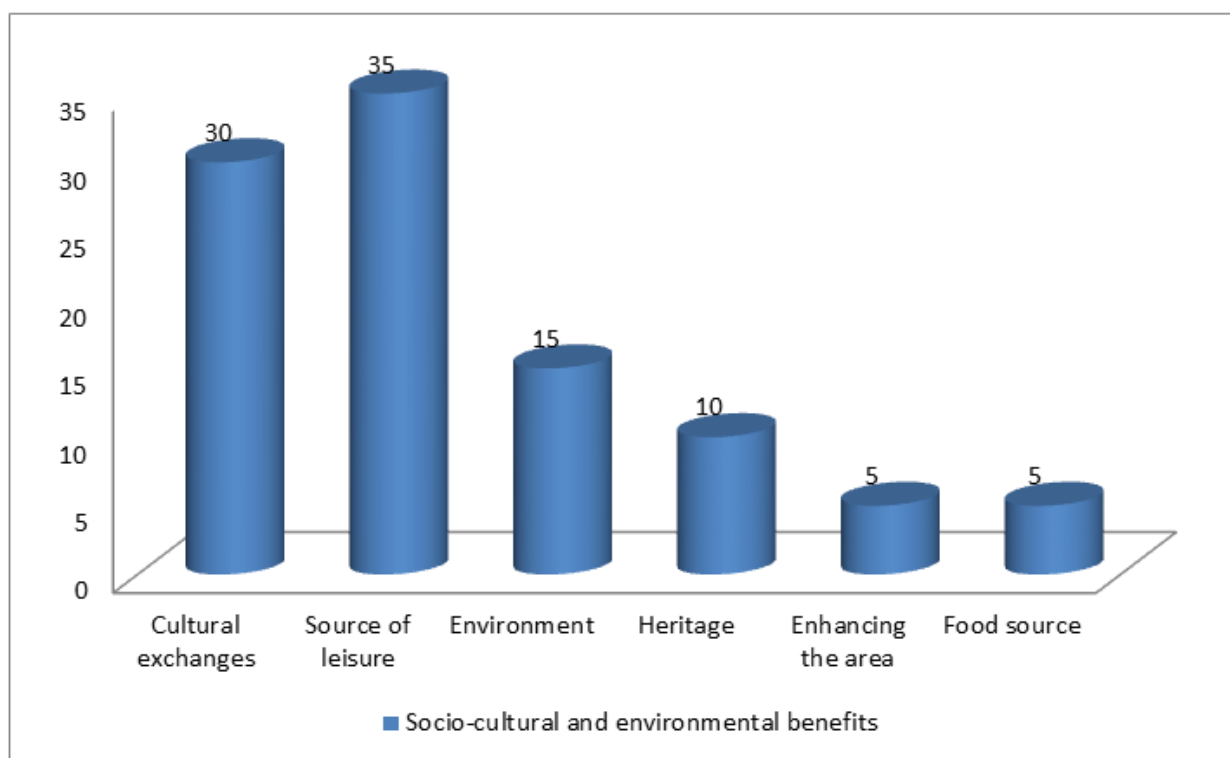


fig 4 Distribution of Socio-Cultural and Environmental Benefits Received by Households Thanks to the Park. Source: Field survey, 2021

Visiting the park is a source of leisure for 35% of the population; for 30%, it is a place of cultural exchange with tourists (for some people, meeting tourists has enabled them to see sophisticated cameras, learn foreign languages, take a plane trip in the company of tourists); for 15%, it plays an important role in the quality of the environment in the surrounding regions; for 10%, it is a legacy for future generations; for 5%, it enhances Madagascar and is also a source of food, as the river that runs through it is very rich in fish.

In summary, 97.3% of the local population claims that they receive benefits from the park's existence. These benefits are mainly rain, which is abundant in the region, work for women's associations, guides, porters and cooks, the construction of infrastructure from the percentages collected from the park entrance fee, and finally leisure through visits to the park's exceptional ecosystem.

➤ *Problems of Natural Resource Management*

• *Wildfires and Tavy*

Clearing, which is linked to the extension of slash-and-burn agriculture, the "tavy"¹¹. The establishment of the population, even temporary, in the immediate vicinity of the boundary of the park is difficult to control and always carries the threat of removals in the Protected Area as well as the extension of poorly controlled fires. By avoiding building a firewall or mismanaging their fire, those who practice "tavy" allow the fire to spread and destroy a portion of forest adjacent to their plot of rice. Cultivable land is increasingly scarce and is continually depleted due to the repetition of burning without respecting fallow times.

• *Hunting and Gathering*

Gathering and exploitation of forest products since the population exploits the products of the forest and makes use of them in all areas of practical life such as building materials for wooden or bamboo houses, sheet roofs ravinala. The trunks are also cut for firewood and for local crafts: tables, chairs, etc. In addition, the bark of bilahy (*Allophantsp.*) is the most coveted because it is used to ferment cane juice. Sugar to get the betsabetsa.

The hunt for large lemurs including Silky Sifakas and Eulemurs, which are the most targeted by poachers¹². According to the Tsimihety ethnic group, the practice of hunting is a usual thing and at each festivity, the meat of lemurs is always considered a high quality delicacy. Therefore, it is highly sought after by wealthy people, especially around the holidays. Thus, hunting these animals

¹¹This is a slash-and-burn practice that aims to set fire to forests in order to later replant rice paddies. Fire is used as the means of creating the field

¹² Andriamboavoavonjy zohasina, 2013, Ecological evaluation of the goods and services provided by the Marojejy National Park through the socio-economic development of the local population of the three villages: Mandena, Manantenina and Ambohiminarina, Memory of CAPEN, University of Antananarivo, 133p

is a source of income for poor families. This type of activity affects the lemur population¹³.

• *Illegal Exploitation of Precious Woods and Stones*

Unfortunately, the villagers seek only to meet their immediate needs even at the risk of compromising the future of natural resources¹⁴. The major problems are:

Illegal logging and exploitation of precious woods, such as rosewood and "palisandre", which also pose a threat to the park's ecosystem. Indeed, the high demand for precious wood in the region is clearly one of the biggest causes of the cuts for a population seduced by the relative ease of an income allowing them to make up for the meager gain from subsistence farming (Andriamboavoavonjy, 2013).. The severely threatened rainforest promotes the spread of invasive species and the destruction of habitat, decreases genetic diversity, participates in openings and further deforestation, not to mention the violation of many taboos and local traditions. Rosewood is cut illegally within the boundaries of Marojejy by a very well organized mafia, causing devastating damage and involving serious consequences. Logging activities are carried out in extreme and often dangerous conditions; they call on an impoverished local workforce. The villagers are threatened and exploited for derisory sums and exhausting and risky work. Only the authorities who facilitate this traffic benefit from it.

The search for semi-precious stones like amethyst still persists within the park boundaries. The attraction of a large and rapid gain always pushes certain sections of the local population or outside the region to exploit semi-precious stones in the Protected Area.

All of these pressures destroy the ecosystem and reduce its ability to regenerate. They continue and intensify with the increase in the local population.

D. Interpretation of Results:

• *Dependence of the Local Population on the Park:*

In the previous section, we saw that the main economic activity of the majority of the population, which is concentrated in agriculture and animal husbandry, is still underdeveloped. Consequently, household income is still low, which leads to a strong dependence on the resources of the park.

During the survey, we asked the population if there are illegal intrusions and exploitation of natural resources inside the park. From the response obtained, we can demonstrate

¹³Ministry of Environment, Waters and Forests/ANGAP; 2003. *Conservation Management Plan - Marojejy* ; 81 p.

¹⁴Andriamboavoavonjy zohasina, 2013, Ecological evaluation of the goods and services provided by the Marojejy National Park through the socio-economic development of the local population of the three villages: Mandena, Manantenina and Ambohiminarina, Memory of CAPEN, University of Antananarivo, 133p

the dependence of the local population on the resources of the park. To this end, 82.3% of the population says that no one enters the park. This figure is still alarming because a little less than 1/5 of the households affirm that there is an intrusion in the park or an illicit exploitation of its resources.

- *Impoverishment of the Local Population*

Despite the benefits, the local population faces various problems including:

Lack of agricultural land, especially rice paddies. However, the local population, which for the most part lives on agriculture, cannot extend the area to be exploited for agriculture because of the region's overly rugged terrain and the application of the park's protection measures. The impoverishment of the soil and the lack of an adequate irrigation system also limit the possibility of extending agricultural land. Similarly, failure to use appropriate inputs for agriculture weakens agricultural yield. These phenomena lead to the food shortage that is rampant in the peripheral areas of the park. This has negative impacts on the protection of the park. At the same time, livestock farming remains underdeveloped since it is practiced extensively and is limited to meeting the food needs of the household.

Low production of cash crops. They are no longer profitable because of the fluctuating price on the local and international market. This results in low household income.

- *The Difficulty of Access to Social Services Such as Education and Health.*

Thus, conservation of Marojejy National Park will not be effective or efficient unless it is accompanied by measures for the economic and social development of the villages in the peripheral zone, ensuring them a better quality of life. These measures include combating food insufficiency by intensifying agriculture and livestock farming, increasing household income by diversifying income-generating activities (popularizing beekeeping and fish farming,...), the promotion of ecotourism leading to job creation (guides, porters, shopkeepers, craftsmen, etc.), the satisfaction of local communities' daily wood needs, the securing of land tenure and the creation of basic social infrastructures such as schools and hospitals. In addition, it is necessary to intensify awareness-raising among local communities, strengthen surveillance within the Protected Area and set up a rigorous control system. The aim is to integrate the local population into the park's conservation process.

III. CONCLUSION

Natural resources such as water, forest, soil, fauna and flora, bring benefits in several ways both to the Malagasy population and to the rest of the world. However, they are threatened because of the degradation of the environment by the harmful action of the anthropic activities which do not cease perpetrating themselves in time and in space. Thus, the conservation of Protected Areas proves useful in remedying this problem. National Parks, among others, deserve special attention. The profusion of animal and plant

species and their endemic nature make these "Protected Areas" unique territories that are not equaled in the world. Marojejy National Park, located in the northeastern part of Madagascar, is marked by the incredible density of its forests, the excessive exuberance of its escarpments, its high cliffs, its evanescent mists, and its incomparable flora and fauna richness. . Being the most prestigious massif of the whole island, Marojejy has already been preserved since 1952. However, since that time it has not escaped the problems related to its conservation for various reasons: the hunting of large lemurs, illegal cutting and the exploitation of precious wood, the extension of slash-and-burn cultivation, the exploitation of forest products, and the search for semi-precious stones. According to the survey, local people are aware of the importance of the park as it provides them with: rain which is needed for agriculture and daily needs; the construction of infrastructure in the village (bridge, track, road, dam, houses for teachers, etc.); 50% of entry fees from park visitors; the rehabilitation of school infrastructure in their villages; work for guides, porters, cooks and women's associations; income from the sale of local products to tourists; the distribution of school kits for students and PPN for the elderly. In addition, tourism leads to the development of commercial activity in the peripheral zone of the park. What approach should be taken to establish a sustainable development policy capable of effectively managing natural resources with a view to their sustainability?

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