

Main Factors Affecting the Condition of the Classified Forests of Faya, Mali

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Abstract: Mali is a landlocked country in West Africa and part of the region known as the Sahel. Currently, 90% of the population lives on 30% of the country's territory. Most of its forested areas — covering 37,741,231 hectares, or 8% of all land — are located in the southern part of the country and are managed by the National Directorate of Forests and Water Management [23].

In recent decades, Mali's forests have been subjected to immense anthropogenic pressure. The country's forest resources experience numerous stresses, including land clearing for agricultural purposes, consumption of firewood and charcoal, timber harvesting, livestock grazing, hunting, and forest fires, which destroy more than 100,000 hectares annually.

This study aims to understand and analyze the main factors affecting the Faya in Mali. The study finds its interest in the fact that it will make it possible to determine the constraints of protection, preservation, conservation in the and the pressures on forest resources but also the profitability of this activity by the populations and the measures to make it sustainable while preserving the forest.

The methodology was based on carrying out documentary collections and analysis, cartographic analyzes, data processing and analysis. The study revealed to us that the fragility of the resources of the Faya in the face of this phenomenon but also the scarcity of water points due to climate change and the lack of maintenance and protection of water sources in the Faya to the increased dependence of the riparian communities on the resources of the Faya although the right of use allows them to do pastoralism, we have seen that it is abused and that other people far from the Faya, say from Bamako and that in complicity with some communities of the Faya, they add their herds to have access to the scarce resources for their animals. Taking these realities into account will make it possible to find means and solutions to reduce anthropogenic pressures on this forest massif and to restore this forest through inclusive, rigorous policies and support for communities. at the end, currently, the forest like all others in Mali are used by army groups.

Based on the research, it can be summarized that due to communities' (rural and urban) dependence on wood, firewood, tree bark for traditional medicine, livestock grazing, intensive agriculture, the absence of alternative income-generating activities, large-scale chaotic urbanization, and finally, rapid population growth, all attempts by policymakers to restore the Faya forests have failed.

Key words: Main factors, natural resources, Faya, conditions, Mali

1. Introduction

Mali is a continental country in West Africa that is part of the area called the Sahel. Currently 90% of the population lives on 30% of the national territory, in the southern part of the country considered as sheltering most of the forest formations estimated at 37,741,231 ha or 8% of the area [1].

Malian forest resources are subject to several pressures, including: agricultural clearing, increased

consumption of wood and charcoal, removal of timber and service timber, bush fires (early and late) which devastate more than 100,000 ha per year and harvesting for traditional medicine [2].

The basic needs of Malian communities are met by forest products. Among them the use of wood as energy (90% of needs), service wood, sawn wood, pharmacopoeia, socio-cultural needs.

It should be noted that in Mali, the National Program for Setting Land Degradation Neutrality Targets has serious shortcomings in terms of management. Mali's forest resources are subjected to numerous pressures,

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including, among others: deforestation to clear land for agricultural crops, increased consumption of wood and charcoal, harvesting of medicinal plants, and forest fires (both early and late), which devastate more than 100,000 hectares per year. Faced with these threats to forest resources, the authorities of Mali have increased the number of forests and protected areas, which currently total 113 and cover an area of 1,338,991 hectares, or 1% of the country's total territory [3].

The first classified forest in Mali which is Faya, is the largest among many others, covering an area of 79947 ha 40 km from the capital Bamako on the RN6, has been the subject of several studies approaches and strategies for its preservation by the different authorities: colonial and postcolonial. Called "Green lung" of Bamako due to its proximity which threatens it from elsewhere and by the 17 neighboring villages, this forest is increasingly threatened [4]. Since its date of classification in 1943, 17 years before the independence of Mali, several operations have been carried out for various reasons. The area was erected as a classified forest and entrusted to the forest management which exploited it excessively and created some plantations of *Tectona grandis* and *Gmelina* in 1966 [2].

From 1972 to 1995, the Operation Development and Forest Productions (OAPF) was created with the mission of managing the classified forest of Faya then the Forest Management Unit (UGF) by law 96-016 of February 13, 1996 in collaboration with the private operator BEAGGES Sarl followed by the Forest Inventory Management Project (PGDIF) and finally since 2013 with the last development plan, the TAM Voyage Company of the operator Mamadou Sinsin Coulibaly becomes the new concessionaire de la Faya with the new policy of ecotourism and vision tourism [5].

The Faya Classified Forest, has not escaped this destruction. The Faya Forest, designated as a protected area long before independence, in 1943, is the largest among the other forest massifs and covers an area of

nearly 80,000 hectares. It serves as a source of timber for Bamako (the capital and largest city of Mali, with a population of 2.71 million), located 40 km from the forest, as well as for nearby communities that include 17 villages. The demographic boom, large-scale urbanization, and high demand for wood leave this forest with little chance of resisting human pressure. The main needs of Malian communities are met through forest products. These include the use of wood as an energy source (90% of needs), the production of lumber, and its use in the pharmaceutical industry and for socio-cultural purposes.

2. Materials and Methods

We carried out the study of the research site (Faya), the documentary research and the interview survey

Study sites

The classified forest of Faya was classified according to Order No. 4054 SE of November 27, 1943 of the Governor General of French West Africa ('AOF). Covering an area of 79947 hectares, the main purpose of the classification was to constitute a reserve of wood for the supply of Bamako and wooden rails. It is located on the right bank of the Niger river about 40 km south-east of Bamako. It is bounded by the parallels 12°36 North and the meridians 8°7 West and 8°15 East (Fig. 1) [6].



Fig. 1 Faya location.

2.1 Documentary Collections

We looked for documentary collections in the various structures in charge of Faya such as: The Regional Directorate of Water and Forests of Koulikoro, at the level of the Kassela and Kati posts, the Directorate of Forest Information System (SIFOR), activity reports but also general and specific works to better understand in order to make a deep analysis of the situation.

2.2 Qualitative Surveys

This led us to meet and talk with the resource persons in charge of the Faya but also in general with a certain number of the senior executives of water and forests. The departments and managers below were the subject of our approach:

Regional Director of Water and Forests of Koulikoro, Director of SIFOR, Head of SIFOR Databases, Head of Posts of Kassela and Kati, Director of GEDEFORE, Technical Director of TAM VOYAGE.

The interviews with these resource people allowed us to clearly identify the different factors of degradation of Faya resources: natural and anthropic as well as the prospects for its management.

3. Results and Discussions

The collection of forest texts of the Republic of Mali in its section 2 of the 2015 edition, describes in significant detail the rights of riparian communities in the forest areas of the State. Note that since the concession of Faya in 2013 to the company TAM VOYAGE accompanied by a development plan, any exploitation outside the right of use is prohibited.

The classified forest estate is free from all rights relating to the forest soil including any prospecting, mining, drilling, any excavation and any other form of exploitation.

However, temporary authorization can be given by the service responsible for its management as part of a cultivation contract with local populations. The forest classification act authorizes the establishment of crops

on deforested land intended to be enriched with protected forest species or having economic value exclusively for residents of the Faya. The contract has a maximum duration of 3 years and cannot under any circumstances be considered permanent. At the end of the contract, the interested party loses to the benefit of the State or the local authority as the case may be, any infrastructure, any tree plantation or other investment built on the land (article 41) [7].

Under article 42 of the collection, in the classified forest area, usage rights are exclusively reserved for communities bordering the forest in accordance with the provisions of the classification law and relate to the grazing of domestic livestock from neighboring villages, cutting and collecting dead wood, heating straw and fruits and products from the natural forest, namely: picking ripe products, flowers, gums, resins, plants or parts of food plants and medicinal, provided that the gatherers do not destroy the producing plants [8].

Hunting and fishing is not considered a right of use in classified forests except in the cases provided for in their management plan. The use of pastures will be carried out exclusively by the herds themselves (article 45) and the right to care for the animals is exercised without human intervention and is done without even temporary installation of the shepherd or his family within the perimeter class. Traffic on foot or by vehicle within a protected area is prohibited outside areas open for the exercise of usage rights, routes recognized as having economic and social utility and within 10 meters on each side of the road (article 47) [7].

Article 48 specifies that “the organization of ecotourism and tourist tourism as well as scientific research is authorized within the perimeter classified by the administration in charge of forests.

In terms of tourist tourism and ecotourism, this authorization may be the subject of a concession to natural or legal persons approved for this purpose by the competent authorities for a fixed period, subject to the payment of fees in accordance with the provisions of the force texts.

The terms of use of the perimeter are defined in a contract and specifications, the model of which is set by order of the minister responsible for forests. In accordance with this last provision, the TAM VOYAGE company of the president of Mali employers Mr. Mamadou Sinsin Coulibaly benefited from the concession of the classified forest of Faya for a period of 30 years for vision tourism and ecotourism. Despite its classification, its abuses are visible and real. What explains it? The abusive exploitation of the right of use by communities? The laxity or corruption of the water and forestry agents in charge of Faya? The incivism of all the actors? Or finally, the application of article 44 of the code which opens the exploitation of the State forest domain which specifies that: "Any exploitation of forest products in the classified area is subject to prior authorization issued by the service responsible for the management of the area concerned".

The delivery of this authorization gives rise to the collection of fees in accordance with the provisions of the texts in force. Free access is only granted if the products are intended either for individual or family consumption, or for a scientific research organization.

The services offered by the Faya Forest yesterday and today are the same. These include: timber, utility wood, firewood, non-timber products, hunting, aerated fodder, etc. Everything indicates that this forest is overexploited, hence the constant bitter reduction in the area of woody resources between 1990 and 2020 to 3832 ha [9].

Wood energy: the wood requirement can be calculated on the basis of: $0.83 \text{ m}^3/\text{inhabitant}/\text{year}$ taking into account the natural growth rate of 3% of the population. The current wood energy needs of villages bordering the Faya are estimated on the basis of $0.83 \text{ m}^3/\text{inhabitant}/\text{year}$. This criterion is very important because it makes it possible to assess the village's pressure on woody resources. It deserves to be taken into account in the projections of pressure parameters on the Faya classified forest for the search for sustainable solutions [10].

Wood is a product in high demand, particularly for domestic energy where it covers 90% of national needs. Wood covers 100% of the needs for cooking food, heating in the cool season, food manufacturing, certain lighting and crafts in rural areas. Where this is rare, millet stalks and cow dung replace wood. Annual domestic consumption is increasing.

The impact of energy wood consumption on forest formations is enormous and as proof, the supply of the Bamako District alone which concentrates 12.46% of the total energy wood consumption for the year 2016 required 1095070.33 steres or a clear cut of 21901.40 ha 6 of one plant. So it was necessary to deforest the equivalent of approximately 22 000 ha to meet the fuelwood needs of the Bamako District during the period 2016-2017 [11].

These woods come not only from classified forests around Bamako but also very far from Bamako to satisfy the capital which has never experienced a shortage of wood, hence the degradation of distant forests from Bamako by rural communities in order to satisfy their needs. vitals and accessories.

However, only the collection of dead wood is part of their right of use, which they abuse in complicity with certain agents of the water and forestry service. The volumes of wood present on the local markets of neighboring villages and Bamako are a striking illustration of this. There has never been a wood breakage in Bamako.

Service wood: is intended for the manufacture of musical instruments, statuettes and many other objects of art and agricultural tools such as hoe handles, Dabas and pickaxes etc. it is more of interest to the modern sector of furniture manufacturing and is limited to cabinetry, joinery, formwork and industrial wood [12].

Lumber: is intended for the manufacture of musical instruments, statuettes and many other objects of art and agricultural tools such as hoe handles, Dabas and pickaxes etc. it is more of interest to the modern sector of furniture manufacturing and is limited to cabinetry, joinery, formwork and industrial wood.

On these map and table, we can observe the degradation of Faya forest within 30 years. It can be explaining by anthropogenic and natural factors although the anthropogenic is so huge. The shrub savannah dominates the forest formation.

Charcoal: The consumption of wood and charcoal is estimated at 459 kg per person per year and at the economic level, forests remain the main source of domestic energy through the wood and charcoal used by almost all of the Malian households, most of which do not have access to alternative energies (gas and electricity). That being said, the exploitation of wood forest products is the most important forest economic activity in terms of volume and income. It generated approximately 1146584211 F.CFA in average income per year from 2014 to 2017 [13].

Logging: From the point of view of logging, the forest is exploited by communities in order to ensure self-consumption and meet the needs of populations living in urban centers. The northern part of the forest is characterized by the production of fuelwood and the southern part tends to be distinguished by massive production of charcoal. It is the main lucrative activity of the villages bordering the Faya and also of all the towns and villages in the southern part of the South where all the forestry formations are concentrated.

It appears as a compensation solution for the loss of income generated by the effect of climate change on agricultural activities (agriculture, livestock and fishing).

Four years before the concession and the current development plan, there were 10530 loggers in the 16 villages bordering the Faya classified forest. The number of operators per product is as follows: firewood: 3212; timber: 43; service wood: 2014; charcoal: 1233. Most of the products produced in Faya are transported to Bamako and other supply locations such as the few weekly markets in the area (Kasséla, Mounzoun, Zantiguila and Markakoungo) etc.

3.1 Pastoralism in the Faya

The Faya is highly coveted by sedentary pastoralists

(herds from neighboring villages) as well as transhumants who thus exert very strong pressure on the forest. In natural formations, this pressure is much more evident in the northeastern parts of the forest. It is also found in the south-eastern part of the forest. The areas concerned are 20,133 ha. These areas are fairly frequented by sedentary livestock for reasons largely linked to their proximity to permanent water sources, especially on the Niger River, which is the main watering point for livestock during low water periods. In these areas, there is great pressure on aerial forages [31].

Added to this direct pastoral pressure is the fairly significant effect of the commercial exploitation of aerial fodder (*Pterocarpus erinaceus*) to supply the markets of Bamako. This pressure is the work of bicycle operators to Kassela (village of Faya on the RN6 road) and then of public transport vehicles to Bamako.

We have noted that strong pressures are exerted in the northern part where the Niger River is located, the main source of water for wintering animals, which is dry in the dry season. With the exception of the Niger River, all water points are semi-permanent or temporary.

3.2 Security Challenges

The security challenges in Mali's forests are a sad reality affecting all segments of society: from rural to urban communities, economic operators, transporters, and so on. The forests serve as havens for armed terrorist groups in this vast, landlocked country. Examples include the Baoulé and Wagadou forests, as well as those along the Ivorian border. The protected forest remains a major strategic refuge for armed groups who cut off roads and attack, to the point that new alternative measures have been implemented to avoid across National Route 6 (RN6). Drone attacks by the army are frequent, as are the rare but risky military patrols.

It is worth remembering that Faya is located a few kilometers from Bamako, which is already threatened by armed groups.

3.3 Weakness of the State and Institutional Constraints

To date, the number of water and forestry agents of all bodies, of all ranks, across the entire national territory does not reach 1000 people even though there are 113 classified forests, perimeters and protected areas, Ramsar sites, etc. The lack of staff and logistical means are enormous challenges in the context of forest protection, including that of FAYA. Corruption and incivism are evils that affect forest protection.

3.4 Natural Factors

About Faya forest as we mentioned in chapter 2, the Niger river which serves the Faya forest in its northern part and feeds the Faya river, is experiencing a drop in its flow. This causes drought and the drying up of permanent water points and the erasure of temporary water points. This can be explained by the effects of climate change [14].

Also, water and wind erosion are part of the natural factors although there is caused also by anthropogenic factors by animals grazing.

4. Conclusion

This forest has been classified, that is to say protected since the colonial period in order to constitute a reserve of wood for the supply of Bamako and wooden rails attracts all the greed of the neighboring communities to the number of 17 villages but also of Bamako which is located 40 km from this forest. Faced with the dependence of communities (rural and urban) on timber, firewood, tree bark for traditional therapy, animal husbandry, intensive agriculture, the absence of other generative activities income, insecurity and conflicts, large-scale anarchic urbanization and finally the population explosion, all attempts, all efforts to restore the Faya by politicians have failed. Through the

new public-private partnership contract tested several times for its preservation in the name of ecotourism and participation, without the implementation of a strategy of dependence on forest resources through a strong energy transition, nothing is not possible indicates the success of this strategy. The gigantic measure that must be implemented is the fencing of this forest, the endowment of forest services with modern technological tools such as the drone to facilitate its surveillance and rapid intervention actions, the creation of income-generating activities for local communities, awareness and ecotourism.

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