

# Impacts of Agricultural Migration on Natural Resources in the Bougouni Region

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**Abstract**— For more than a decade, farmers from the Koutiala and Yorosso districts have been heading towards Bougouni and Yanfolila in search of farmland. The departure areas, which once hosted victims of the 1970s and 1980s droughts, are becoming repulsive. With this massive influx, the host areas are suffering negative environmental impacts in turn. The main objective is to analyze the impacts of this migration on natural resources in the host areas. The mixed method is adopted. A questionnaire is sent to 240 heads of Agricultural Production Units (UPA) selected at random, and 15 semi-structured interviews are conducted with resource persons and heads of indigenous families in a reasoned manner. In fact, this research reveals several negative impacts on the receiving environments of agricultural migrants. Thus, 48.8% of respondents report land degradation. As a result, non-natives rarely practice fallow land given their precarious status as foreigners. According to the migrants' logic, the loaned fields are used to ensure the subsistence of their families; therefore, it is difficult to apply fallow land under these conditions. In addition, cotton cultivation is the preferred speculation of non-natives, which also requires the use of fertilizers and other inputs. These chemicals are also harmful to the soil and, consequently, the environment. Furthermore, the decline in yields and land pressure represent 11.7% and 09.2% respectively. In addition, excessive logging is the most cited impact, with 50.8% of respondents, or more than half, citing it. This is partly due to the clearing of new fields, which leads to the degradation of wooded areas by migrants for agricultural purposes. Furthermore, bushfires constitute 34.2% of the sample. All these practices also contribute to the disappearance of fauna and flora, the loss of land quality, erosion, and air pollution, among other effects. Furthermore, this migratory dynamic has positive impacts on local development. These include increased cotton production, increased membership in village associations, the construction of social infrastructure (markets, schools, wells, etc.), the emergence of microfinance, and the introduction of new agricultural practices by agricultural migrants in host areas. However, these negative impacts exacerbate tensions between non-natives and natives. Consequently, their guardians have instituted measures to restrict access to land and withdraw fields.

**Keywords**— Impacts, agricultural migration, non-natives, natives, natural resources.

## I. INTRODUCTION

In terms of rural migration, natural resources are a determining factor in the choice of arrival areas. However, the sustainable management of these resources by migrants raises questions. In a context of worsening climate conditions, the environmental impacts of agricultural migration are becoming a concern in receiving areas. The environmental and socio-economic situation of the Sahel in general and Niger in particular is becoming a primary challenge for actors and policymakers. The economy is based on agriculture, which is continually deteriorating due to climate change and anthropogenic impacts on natural resources (Aboubacar, 2021).

However, the settlement of agricultural migrants contributes to the host area's economic dynamics. All of which would lead to land saturation and a scarcity of fertile land. As noted by Tuo et al. (2018) in Côte d'Ivoire, following the integration of immigrants into the Dianra department, agricultural activities experienced remarkable growth, with immigrants predominating in both plant and animal production. Opting for extensive farming, they gradually led to the "end of arable land" and with it, the grazing areas. This phenomenon is a source of competition and rivalry over natural resources. Over the decades, land pressure has increased, generating conflicts and strategies to occupy the still "free" spaces with planted trees, markers of land. Thus, the sons and grandsons of immigrants hastily plant rubber trees to defend their lands against the attempts of the second generation of natives to reclaim them. (Ruf et al. 2019).

For more than a decade, farmers from the Koutiala and Yorosso circles have been heading towards the Bougouni and Yanfolila areas in search of agricultural land. The departure areas are becoming repulsive, which once welcomed victims of the droughts of the 70s and 80s. With this massive influx, these localities are experiencing the impacts of this migration. Indeed, the host areas (Bougouni and Yanfolila) have natural resources and favourable climatic conditions for practicing agriculture, which is the main activity of these agricultural migrants. As Nana (2018) says in Burkina Faso, "Migration movements generally start from poor, disadvantaged, and rural areas towards those that are more favorable, with higher agricultural yields, or towards the cities. From this geographical mobility often arises both upward social mobility, that is, an improvement in socio-economic living conditions through the opportunities provided by the environment: a shift from less productive agriculture (subsistence and slash-and-burn farming) to more productive agriculture (commercial or cash crops, mechanised farming, etc.), from the primary sector to the secondary sector."

Agricultural migrants are perceived as actors who cause environmental damage with unorthodox practices. Previous studies comparing the practices of migrants and locals in the forest-savanna transition zone depict migrants as aggressive and environmentally destructive. Indigenous farmers are portrayed as "heroes" who conserve, or even enhance, vegetation cover (Geest 2010). As this author Camara (2008) explains: "conflicts in southern Mali in general are related to the scarcity of land and the pressure on natural resources due to the intensive cultivation of cotton and the increase in population." Following the repatriation of thousands of Malian migrants from Côte d'Ivoire, the pressure on natural resources

has increased. What are the impacts of agricultural migration on the natural resources of the host areas? The main objective of this article is to analyse the impacts of agricultural migration on the natural resources of the Bougouni and Yanfolila districts.

II. METHODS

In the context of this work, a mixed approach (qualitative and quantitative) was favoured. As for the quantitative approach, the main targets are the heads of agricultural production units (APUs) or their representatives from the allochthonous population. The criteria for selecting villages also included identifying those that host significant internal migrants and those experiencing a resurgence of socio-land tensions between allochthons and autochthons. Increasingly, it is the extreme South of these circles, towards the North of Côte d'Ivoire, that attracts migrants seeking natural resources. Thus, two villages were targeted in a reasoned manner, based on the importance of the migratory flow and the level of socio-land tensions.

To do this, 240 heads of UPA were surveyed using simple random sampling from eight villages across four communes, two per commune. As for the qualitative method, 15 semi-structured interviews were conducted with resource persons and heads of indigenous families, following a structured approach. It allowed for triangulation with the quantitative data collected through the questionnaire.

TABLE 1: Investigated Areas

Zones	Circles	Communes	Villages
Reception areas	Bougouni	Sibirila	Ouogona et Kodonoun
		Yinindougou	Manfala et Solakoroni
	Yanfolila	Gouanan	Kokoun et Guélékétiguila
		Koussan	Sandougoula et Kouralamini

Source: Field data, 2019

Regarding the analysis of quantitative data, SPSS Statistics version 23 software was used. It involved conducting a statistical analysis in order to create graphs, tables allowing for the comparison of variables, cross-tabulations, and flat sorting. While the qualitative data, the transcripts of the verbatim speeches, were subjected to discourse analysis techniques by grouping the recurring themes.

III. RESULTS

3-1- Impacts on Agricultural Lands

The table below analyses the impacts of newcomers' practices and actions on agricultural lands.

TABLE 2: Impacts on Agricultural Land

Impacts	Frequency	Percentage
Poor soil quality	117	48,8
Land pressure	22	9,2
Declining yields	28	11,7
Other	73	30,4
Total	240	100

Source: Field data, 2019

At the level of the host localities, this anthropogenic pressure is not without consequences on natural resources, as shown by the data in this table. The poverty of the allocated lands constitutes 48.8%. This migratory dynamic dates back at

least 15 years; the first lands granted to migrants are beginning to degrade. As a result, allochthons rarely practice fallow land because they are non-titular landholders. In the migrants' logic, the lent fields are used to ensure their families' subsistence, making it difficult to foresee fallow periods under these conditions. As for the landowners, they are depleting the soil's fertility due to the high pressure from the migrants on the land. According to them, the newcomers are in a logic of wealth accumulation, hence the absence of fallow land. Chemical fertilisers and pesticides are used, which contribute to soil degradation. Cotton cultivation is the preferred speculation of allochthons, which also requires the use of fertilisers and other inputs. These chemicals are cited as harmful to the soil and, by extension, to the environment.

And then, the decline in yields and land pressure account for 11.7% and 9.2%, respectively. These low rates can be explained by the fact that the respondents through the questionnaire are essentially newcomers. First, in relation to their places of origin, the yields here are higher. Next, regarding land pressure, it is mentioned as a result of this mobility. That said, yields have declined compared to their early years of work. There is obviously a correlation between the decline in yields and soil poverty. They also attribute it to poor soil quality. Others point to the lack of resources, such as agricultural equipment, the difficulty of accessing agricultural credit, and the quality of the land given to migrants. Some are left with already eroded lands or marginal lands provided to them. The effects of climate change are also cited as a cause of soil degradation. In this regard, they cite the irregularity of rainfall, flooding, and strong winds.

Like any traditional society, others see it as a divine curse, as illustrated by the words of this outsider, Y.B: "I arrived in the area in 2006, the yield is declining due to the disagreement between our guardians and us, God is punishing us." Even though this shortcut is not plausible enough to explain this phenomenon. There are growing disputes over land, given the stakes involved in these strategic resources. This leads the most fatalistic to invoke God's wrath. This cited excerpt is also an invitation to peace, to understanding among the different protagonists to abandon the strife that especially harms the newcomers. It is also diminished by the massive influx of migrants, which puts pressure on land. The cultivated areas per person are also diminishing due to this migratory phenomenon.

Finally, the "other" option received 30.4% of the respondents' opinions. This high rate is justified by the fact that "other" has given several meanings at this level. First, those who have not observed negative effects on agricultural lands. One must partly see it as a strategy on their part to obscure the issue of natural resource degradation. Being allochthons, considered as people who are just passing through, few of them care about the sustainability of the resources they exploit. And also, the allochthonous respondents do not take responsibility for the degradation of the exploited lands. While the indigenous people describe them as predators driven by a logic of wealth accumulation. In case of land depletion, they continue their journey in search of a new Eldorado.

On the other hand, some go so far as to say that their yields remain constant. On the other hand, others report that their

yields increase every year. This is attributed to their perfect mastery of agricultural work (their expertise), family labour, soil fertility, agricultural equipment, and also access to credit from microfinance institutions. All these factors are likely to increase or maintain their agricultural production. In addition, a category of wealthy individuals of foreign origin is emerging in the host areas who possess the financial means and agricultural equipment necessary to achieve high yields.

Generally speaking, the significant influx of migrants has had negative impacts on the agricultural lands of host sites. There is soil poverty, with its corollary of reduced yields and land pressure, while a category of investigators believes that their production is constant. An increase in agricultural yields is also claimed by some respondents. Opinions on the matter are divided; the locals attribute the negative effects observed in their areas to them.

**3-2- Impacts on pastoral and forest resources**

The table below presents the results on the negative impacts of migration flows on pastoral and forest resources.

TABLE 3: Impacts on Pastoral and Forest Resources

Impacts	Frequency	Percentage
Bushfires	82	34,2
Excessive logging	122	50,8
Pressure on pastureland	11	4,6
Settlement in forest areas	3	1,3
Other	22	9,2
<b>Total</b>	<b>240</b>	<b>100,0</b>

Source: Field data, 2019

At first glance, this table shows that excessive wood cutting is the most cited impact, with 50.8% of respondents, or more than half. This is partly due to the opening of new fields, which leads migrants to clear wooded areas. Their guardians assign them areas to clear for agricultural use. To do this, plant species that have been around for several years are cut down without considering their ecological, economic, and sociocultural functions.

Alongside the satisfaction of agricultural land needs, there is the cutting of firewood to meet household wood needs. This need increases with the massive influx of migrants, not to mention other uses such as wood for construction and carpentry. The consequences include deforestation, the disappearance of plant and animal species essential to the environment, health, and nutrition, erosion, and the exacerbation of climate change effects, among others. It should be noted that a strong pressure is exerted on the ecosystems of the host sites within the framework of this migratory movement. This irreversibly accelerates the degradation of natural resources.

Photo 1: A forest transformed into an agricultural field



Source: Field data, 2019

Furthermore, bushfires account for 34.2% of the sample. These are voluntary bushfires used by farmers to clear fields of weeds before planting crops. Generally, the areas allocated to migrants for agricultural activities are well-vegetated. Fire is used to clear biomass from these lands intended for agriculture. This phenomenon cannot be attributed solely to allochthons; they have certainly exacerbated it through their significant presence in these areas. Moreover, these practices promote the loss of wildlife and flora, soil degradation, erosion, and air pollution. It is also one of the factors that trigger desertification.

On another note, the pressure on fodder accounts for 4.6% of the respondents. These areas attract more herds of transhumant herders due to the availability of fodder. The pressure on pastoral resources is estimated to be very low, given this percentage. According to the surveyed individuals, the impact is minimal. While the settlement rate in forests as a place of residence is 1.3%, this is based solely on respondents' opinions, who are primarily allochthons. But through field observations, a significant number of migrants are settled in hamlets, thus in the forests. However, many ignore or downplay the consequences on forest resources. And even the locals have little awareness of the negative impacts on flora and fauna. This installation also requires deforestation to build a dwelling, with consequences for natural resources.

Thus, based on this data, it should be noted that this migratory phenomenon has several negative impacts on forests and pastoral resources. The various stakeholders interviewed are not very aware of the extent of these impacts, which should be taken seriously. Alongside this rather unflattering picture, their presence also has a positive impact on local development in the host areas.

Photo 2: Trees burnt alive



Source: Field data, 2019

**3-3- Impacts on the development of reception areas**

The graph below illustrates the contribution of newcomers to local development at the reception area level.

According to the table, cotton contributes 32% to development. This rent constitutes a financial windfall that legitimises the reception and settlement of migrants. Beyond that, cotton cultivation provides benefits to the local population. The words of B.G, a migrant farmer, are quite enlightening on the subject: *"With our arrival, cotton production reached 500 tonnes, but before it was 60 tonnes. The water problem was tackled; we contributed to building a water tower; and the rebates paid by CMDT."*

Beyond that, the customary authorities, and, by extension, the local population, also benefit from the royalties received as dividends from migrants' cotton. In official speeches by traditional authorities, this levy is intended for local village development. Moreover, according to the views of the allochthons and other social strata, the royalties are partly

diverted for the personal purposes of the village leaders. Despite respondents' contrasting views, cotton generates considerable economic benefits for these localities. It is one of the issues that generates tensions among the different actors in the socio-land arena.

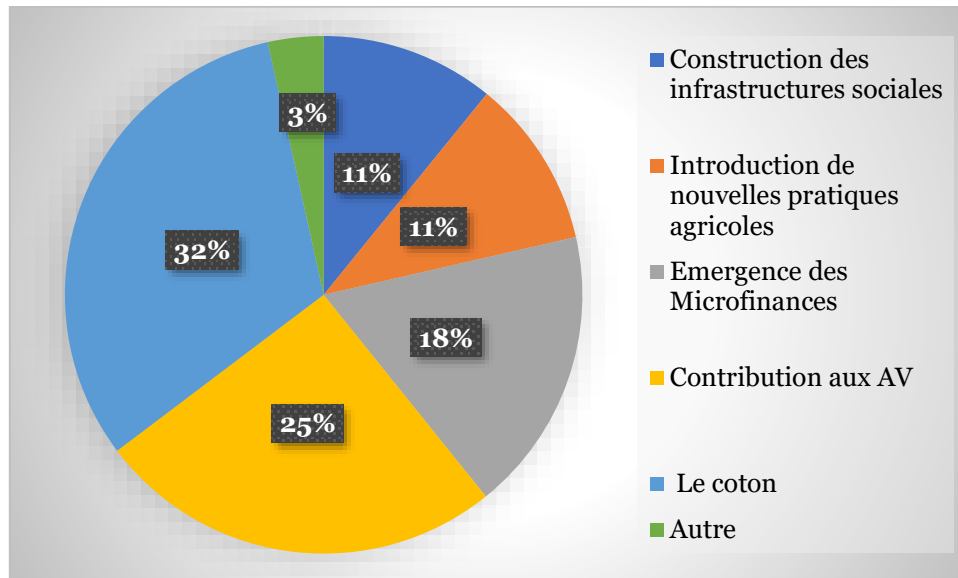


Figure 1: Migrants and Development

Source: Field data, 2019

Another significant element is the large number of migrant members in village associations, commonly known as AVs, which contribute to local development in host sites and account for 25% of opinions. Its membership is one of the conditions for reception and settlement. Apart from the membership and subscription fees, these AVs store and market cotton with the CMDT. They also collect fees on each tonne of cotton from outsiders; they receive and distribute the rebates among the different producers. This structure is the most dynamic at the village level. The major challenge is to have renowned activists who are model producers. Another issue that arouses envy is the management and control of AV and its financial resources. However, with the massive arrival of migrants, these village structures are being reinforced with new members. The saved resources allow for the construction of basic social infrastructure, even though the management of these AV remains unclear and opaque, according to several members. They mention suspicions of embezzlement and corrupt practices that mar them.

On the other hand, microfinance institutions account for 18% of the sample. The allochthons believe their arrival has boosted the host areas' economic dynamics. Since they are experienced cotton producers. Cotton production requires support from these savings banks to finance the agricultural activity. According to an NGO worker operating in the area without agricultural migrants, the savings banks will operate at a loss. That said, there is a correlation between migratory flows and the emergence of microfinance institutions. In the same vein, this village chief declares in these terms:

*We issued a call when we were ready to welcome the Minyankas. We were in need. We learned that they are hard workers. At the time, the village owed 6,500,000 to the BNDA. The noose is tightening around the village's neck. With this in mind, migrants are being brought in to pay off this debt.*

The allochthons consider themselves the architects of rural development in these areas. Despite the labels (predators, belligerents) that some attach to them, they are also perceived by other locals as hard workers, saviours. But over time, the relations between these migrant seekers and their hosts have evolved into a situation of conflict.

Thus, their contribution to the construction of social infrastructures such as wells, schools, and markets is quite significant, accounting for 11% of the respondents. The introduction of new agricultural practices also represents 11%. This figure can support the statements of this village chief from a host locality, I.S, who says the following:

*As for their contribution, the newcomers also contribute to the development of the village in terms of labour." In our village, we do not rely on the State and the Municipality to build schools, wells, and other facilities. Their various contributions enable community projects to be carried out.*

Migrants' role is very significant in the acquisition of collective equipment in these areas. As part of decentralisation, local development is entrusted to local authorities. However, they are lacking the necessary financial resources to cope with it in all cases. Thus, local communities sometimes manage to provide basic social services. In the specific case of this study,

migrants are a boon for the local population to contribute to the realisation of these community projects. It's an opportunity to fill the gap.

On the other hand, the installation of these individuals also creates a growing need for social facilities. In this regard, their contribution is seen as a duty to meet their own needs since they are beneficiaries just like the locals. While allochthons present themselves as vectors of development for households receiving migrants. In their view, they are migrants and therefore just passing through; all these achievements constitute a heritage of the host villages. Most believe that without their contribution, the arrival villages were in a state of total destitution. This is how this allochthonous leader, Y.S, enumerates their achievements in their arrival village in this interview excerpt:

*In this village, we are the bearers of development; we built the school, the wells, a microfinance fund, the market, collective works, the levy on each tonne of cotton, and even the labour. However, we are never consulted by the locals; we are just simple executors. The dividends from cotton, none of us (non-natives) know the destination of these amounts collected; we don't even dare to ask what they are used for.*

In the same vein, 11% of the respondents claim that they have introduced innovations in agricultural practices. Their agricultural practice is extensive farming with cotton cultivation. And the local population is increasingly inspired by it. According to some interlocutors, they learned cotton cultivation techniques from them. Cotton production was marginal in these localities. The development of agriculture is their work, and its benefits are advantageous for the entire local community. However, the "other" category accounted for only 3% of respondents' opinions. Some refer to the availability of labor, such as masons and mechanics. Others also highlight their participation in the village's collective work to justify their contribution to local development. The words of this chief, B.D from a receiving village, reflect local realities: *"The newcomers provide labour for brick-making, they farm for people in exchange for money. They also contribute to the village's cotton. They have contributed to the village's economy (money circulation, market, ...)."*

Generally speaking, by analysing both quantitative and qualitative data, the contribution of outsiders to local development is a tangible reality. Allochtones are defined as vectors of development. As this allochthon, F.G, puts it:

*"We bring a lot to the village; before we arrived, there was not even food to be found. It was total hardship. Our first year, there was famine, and we survived. It was their women (the indigenous people) who managed to make do. But we, the outsiders, were able to overcome it thanks to our determination."*

However, there is another side to the story: the indigenous people who are hostile to the settlement of newcomers reject the development arguments put forth by both sides. They characterise them as predators, grave diggers of their natural resources.

#### IV. DISCUSSION

This study converges with this study, which estimates that migration in West Africa can have negative environmental impacts. A vicious cycle can then set in. Environmental degradation encourages migration, which in turn contributes to further environmental degradation in destination areas (Brüning & Piguët, 2018). Additionally, the results of this study corroborate those of Chauveau (2000), conducted in Côte d'Ivoire, which asserts that such a movement of agrarian colonisation has obviously caused recurring conflicts, which have manifested both in land rights and in the modes of coexistence between different communities. The conflicts between the indigenous people of the West and the Baoulé migrants were then the most significant.

The allochthons consider themselves the architects of rural development in these areas. Despite the labels (predators, belligerents) that some attach to them, they are also perceived by other locals as hard workers, saviours. These results are in line with those of Tuo (2018), who argues that the analysis of immigrants' contributions to the dynamics of agricultural sector activities shows they are key players in the agricultural development of the Dianra department and, by extension, in local development.

In the context of this study, the results on agricultural yields also show that they encourage farmers from vulnerable areas to migrate. Few empirical studies have examined the income differential between rural migrants and rural areas. Nevertheless, Poncet (2004), who worked on the dynamics of internal migration in China, concludes that: *"given migration costs and wage differentials, migrants prioritise moving to provinces with high market potential."* This author attempted to analyse the case of rural migrants to cities. This differs from the results of this thesis. This research also attempts to compare the incomes at the departure and arrival sites, both rural areas, in numerical terms, while this author focused on the greater salary differential offered by the city.

Generally speaking, the significant flow of migrants has caused negative impacts on the agricultural lands of the host sites. There is soil poverty, with its corollary of reduced yields and land pressure, while a category of researchers estimates that their production is constant. These results are confirmed by those of Diarra (2007), who estimates that migrants have influenced locals in intensifying wood cutting and charcoal production. This activity previously involved the residents of Bougouni (ganadugukaw); today, it is practiced by all ethnic groups because it is very lucrative. The classified forest of Djina exists only in name; all the trees that reached 4 to 5 meters in height have disappeared. The same goes for the wildlife. What predominates in most of these previously bushy areas is precisely the hamlets.

The reception areas (Bougouni and Yanfolila South) are increasingly refusing to accept new migrants. Thus, environmental concerns are being highlighted to evict migrants or clear the fields. The establishment of forest reserves in the municipalities of Koussan and Yimindougou is cited by land regulatory authorities as a reason for refusing to accommodate outsiders or imposing land restrictions on them. These results are also similar to the findings of these Comorian authors. Saïd

& Sibelet, (2004): the case of Bandarsalam on the island of Mohéli shows that the locals use an alibi, namely an environmentalist argument, with political and associative institutions to evict the allochthons who have become too bothersome, from their point of view, in their installations.

#### V. CONCLUSION

Ultimately, this migratory phenomenon affects host environments. It should be noted that it has both negative and positive impacts, depending on the perceptions of the different categories of actors. Two registers emerge, with most of the locals attributing the degradation of their ecosystem to outsiders. In this regard, they mention the land's poverty, excessive logging, and degradation of pasture areas, among other issues. As for the newcomers, they emphasise their contribution to the local development of the arrival sites. According to them, thanks to their efforts, social infrastructure has been built, including schools, wells, and markets. Increasingly, the conditions for accessing the host areas have been tightened to deter newcomers. Their main argument put forward concerns the degradation of natural resources by outsiders. Even though the phenomenon has slowed down in these localities, the new agricultural migrants and those expelled are targeting other areas of the country, particularly Western Mali (Kita, Bafoulabé, etc.).

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