MIGRATION AND OCCUPATION OF RURAL LANDSCAPES: CASE OF THE COMMUNE OF KOURINION IN WESTERN BURKINA FASO.

Abstract

In Burkina Faso, the agricultural peasantry is in a frantic search for means of subsistence to satisfy its absolute needs.Thus, the orientation of cultural practices according to economic and social issues constitutes an alternative, but it leads to social transformations, a dynamic in land occupation and an influence on natural vegetation. This study aims to analyze the evolution of the occupation of rural landscapes and conflicts of use in connection with the migratory phenomenon in the rural commune of Kourinion. In addition to the literature, this work is based on the analysis of information collected from farmers, land occupation data from 2000 and 2020 and direct observations in the field. The study made it possible to know the conditions of evolution of production systems and the socio-economic and environmental issues of these mutations on rural landscapes.The results reveal that the human and physical potential of the Commune conditions the evolution of agricultural practices centered on arboriculture and cotton cultivation.The diachronic analysis shows a spatio-temporal change through a reduction in the surface area of natural formations in favor of anthropogenic formations: rainfed crops by 41% as well as orchards and residential areas by 30%.The study also confirms that the current changes have a positive impact on the living conditions of households but are variously appreciated on the environment.

Keywords: Migration, Mutations, Production systems, Rural landscapes, Kourinion

INTRODUCTION

West African countries are subject to increasingly marked rainfall variability that sometimes causes droughts, sometimes floods, due to global climate change.And the rainfall pattern is seriously disrupted, with a decrease in the number of rainy days and uncertainty about the start and end of the rainy season (Kaboré et al 2019) [...].Agriculture is affected by many constraints that are low soil fertility, demand for food due to strong population growth, urbanization and climate variations and changes.In Sahelian countries such as Burkina Faso, the pressure on natural resources is particularly high.This situation is accentuated by demographic pressure and poverty, which mean that populations are concerned about exploiting natural resources solely for their short-term survival.In sub-Saharan Africa, the population is considered an important resource for development and wealth creation.Furthermore, migration within rural areas is also an increasingly important phenomenon, although statistics on this are fragmentary (Hountondji, 2008).It is nevertheless clear that more and more people are leaving densely populated areas, particularly the Mossi plateau of Burkina Faso and the peanut basin of Senegal, for more welcoming places in the Sudano-Guinean zone (Henry et al., 2003 op.cit. Hountondji, 2008).The frantic race of populations towards these resources has led to the creation of new rural population centers.In the long term, these migratory waves lead to profound changes in biodiversity.Any alteration of this capital leads to harmful impacts, both from an environmental and socio-economic point of view, as in the Democratic Republic of Congo, where demographic pressure has resulted in the destabilization and dysfunction of forest ecosystems, which have been degraded, fragmented and largely deforested (Bamba, 2010).These dynamics result from the combination of several factors: clearing for agricultural needs, bush fires, population increase, uncontrolled logging, [...], among others (Solly et al., 2020).Understanding observations on landscape changes is crucial due to interactions with human activities.This study analyzes the evolution of rural landscapes in the rural commune of Kourinion and the factors responsible for their dynamics using satellite imagery and field data for better biodiversity management.It also aims to

verify the hypothesis that natural formations have regressed in favor of anthropogenic formations such as crops and fallow land.Remote sensing is, in this respect, an effective means of identifying, characterizing and monitoring landscape changes.It allows to cover a given area in a short time, to reduce costs, to visually describe a given situation and its evolution over time, but also to retrospectively evaluate changes (FAO, 2012).

1. Methodology

1.1 PRESENTATION OF THE STUDY AREA

The studywasconducted in the rural commune locatedbetween longitudes 4°38'30'' and 4°55'00'' West and latitudes 10°55'30'' and 11°12'00''. It covers an area of approximately 62,253 ha.

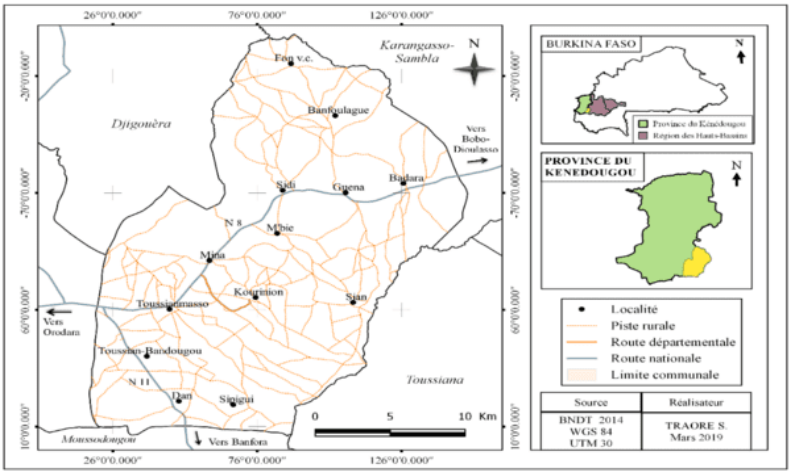
The commune of Kourinionislocatedapproximately 70 km from Bobo-Dioulasso, the capital of the Hauts Bassins region to whichitbelongs, and approximately 10 km from Orodara (capital of the Kénédougou Province). More precisely, itislocated on the Bobo-Dioulasso-Orodara route via national road number 8 (RN 8). The commune of Kourinionisbordered by the communes of Moussodougou to the south, Toussiana to the east, Karangasso-Sambla to the north-east, Djigouéra to the west and north-west and Orodara to the south-west.

The study area has a South Sudaneseclimatecharacterized by 2 major seasons:awetseason and a dry season. The rainyseasonlasts about 6 months and the wettestmonthremains August. The commune, like the province of Kénédougou, records one of the highestrainfalls in the country withannualprecipitationrangingbetween 900 and 1,200 mm.Averagetemperaturesvarybetween 24°C and 30°C with a relativelylow thermal amplitude of 50C.

The relief of the commune of Kourinionis made up of sedimentary rocks. The average altitude is 500 meters. The overallslope of the municipal territoryis West-East, withresidual reliefs such as mounds and hills. The valleysconstitute the beds of watercourses, some of which are permanent.

The wooded savannah is the dominant plant formation with a dense grassycarpet in the municipality of Kourinion. The main plant speciesfound in the municipalityare:Lanneamicrocarpa (wildgrape), Pyliostigmareticulatum, Elaeis guineensis (oil palm), Parkiabiglobosa (Néré), Vitellariaparadoxa (shea), Bombax costatum (kapok), Ziziphus mauritiana (jujube), Saba senegalensis (vines), Acacia macrostacha (Zamènè), Khaya senegalensis (cailcédrat), Tamarindusindica (tamarind), Borassus aethiopum (palm palm).

Map1: Location of the study site



1.2Tools and methods

To address these concerns, we conducted a quantitative and qualitative field survey.This field work took place in six villages in the commune of Kourinion.It involved semi-structured interviews with indigenous and non-indigenous farmers, technical service agents and field observations.Within the villages, producers were selected randomly because they carry out almost the same agricultural activities on their farms.The surveys were conducted on a sample of 60, this because all producers cultivate almost the same crops. In addition, a diachronic approach with the use of remote sensing data was adopted.It was a question of detecting and mapping changes in the area's vegetation cover, then analyzing the satellite images obtained using GIS techniques.The Landsat 7 ETM 2000 and Landsat 8 ETM OLI 2020 satellite images obtained at the National Observatory for Sustainable Development (ONDD) were used for this purpose.These images date from August 2000 and 2020, a favorable period for monitoring the evolution of cultivated land because it corresponds to the wintering period.

2. Results and discussion

2.1 Factors of degradation of natural formations

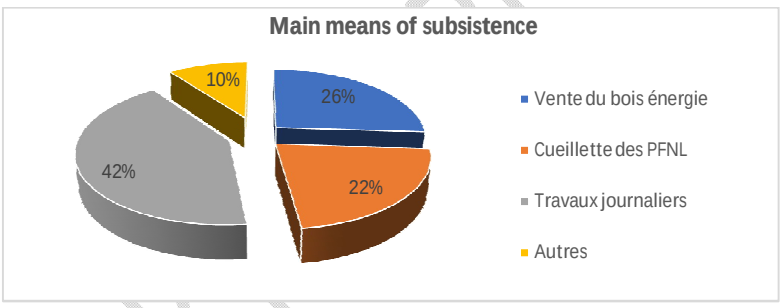
- **Migration and consumption of wood energy**

In the study area, migratory movements took place in 2 orders.

The first benefited from the land due to the hospitality of the indigenous populations.The latter brought their relatives from more arid areas due to the mild climate.They are the Mossé, the Peulh, the Bobo, the Lobi and the Dagara.Most of these migrants are generally from the Central Plateau, the Northern region and the Sahel.Thus, the commune welcomed its first wave of migration following the major droughts of 1970. The availability of water, the suitability of the soils for agro-pastoral activities, a very large and rich plant and grass cover, easy access to land and above all the hospitality of the population are determining factors of this migration (Traore, 2021).This movement intensified following the drought of 1983-1984, and the first ones brought their parents.This family reunification thus continued until the year 2000 (Sanogo, 2008).After this date, the scarcity of cultivated land led to a slowdown in this movement.The security crisis led to a second wave of migration towards more

or less secure areas.With the galloping population, these last waves did not benefit from the land.In order to meet immediate needs, these migrants developed means of survival.Among these means, we note among others, the sale of wood energy, the gathering of NTFPs, daily work on farms, etc. In the commune of Kourinion, the sale of wood energy has increased significantly.This was possible due to the ever-increasing demand for wood energy from large adjacent urban areas, the unavailability and high cost of modern energy (butane gas, electricity) on the one hand, and on the other hand due to its proximity (50 km) to the city of Bobo-Dioulasso and its accessibility by the road network (RN8).The techniques for producing wood energy (26%) such as cutting firewood and carbonizing wood (a technique for obtaining charcoal) lead to the degradation of natural resources, particularly plant cover, and therefore a significant reduction in biomass in the municipality.They also have consequences on the richness of the vegetation because the floristic composition of the environments has also been modified by human activities.

Graph 1 : Livelihoods of migrants



Sources : Données terrain, ***TRAORE S. 2022***

Photo 1 & 2: Coal and wood sales activities

- Agriculture

When fallow land is no longer long enough to allow the forest to regenerate, cultivation is no longer a temporary intervention on the forest: it modifies the plant cover in a sustainable way (Dossoumou, 2010 op.cit. Todan et al, 2017). This state of affairs is due to the increase in population and, by extension, the arable land. In the commune, agriculture is partly responsible for the degradation of natural resources. Shifting cultivation on slash and burn, dominated by cotton and cereal crops, has caused the dispersion of farmers in the commune and mainly in its northern part. Rainfed crops, especially cotton, are very developed in the villages of Guena, Sidi and Banflagoué. This speculation provides agricultural producers in the area with between two-thirds and three-quarters of their monetary income.

-Migration and exacerbation of land conflicts The increase in population thus leads to land pressure which manifests itself in overexploitation of the environment and consequently, a degradation of the environment, jeopardizing the sustainability of agriculture (Abdoulaye, 2015 op.cit. Todan et al, 2017). The physical potential of the area has contributed to developing a cultural mix and know-how of the populations, thus stimulating good social cohesion. Land saturation is nowadays exacerbated by migratory movements and the financial health of fruit products increasingly generate land conflicts. The data collected in the field and the documentary review support this state of affairs. The control of space and natural resources commonly pits individuals, neighborhoods or sometimes villages against each other; some, in search of fertile land and others, motivated by the abundance of pastures. Several sources of conflict have been identified. The colonization of fruit tree lands (Cashew) by non-owner farmers (53.7%) occupies an important place in the Commune. And each producer, native or non-native, intends to leave enough to meet the needs of his family. And faced with this situation, the challenge for the appropriation of land is much more social than economic in the medium term. Thus, occupying land by planting fruit trees in fallow or uncultivated areas, often without the approval of landowners, seems to be the way to hope to appropriate land. The development of land by non-owner farmers and encroachments on the boundaries of fields (27.3%) adjoining farms are also the reasons for the unrest between cohabitants. The fields that lie fallow are the preferred targets that are more likely to be nibbled by immediate neighbors. "Every year, it advances by a few ridges in my field (usually fallow land)'', he says;this is why many farmers mark the boundaries using different methods.The elders used to mark the boundaries of the fields by simply marking residual forest species such as cailédrats and baobabs or between hills and ravines.But because of their virtues, the need for pastures and/or food, these forest species are no longer spared, the demarcation between farms is done by planting eucalyptus all along or cashew nuts on an area.The wealthiest proceed to establish a land title, a guarantee of land security. The death of one of the parties having been at the origin of the portion of land ceded.It generates tensions between generations, the new owners who have each inherited from their family line but including one who was once the main owner (20.00%).But the reason put forward, our grandfather lent it to yours, leads especially in areas where arboriculture is developed, to a new redefinition of land and the renewal of the exercise of land rights.Following Audouin (2014);these mechanisms for redefining rights exist - when it is a resource already present in the village but which suddenly takes on a much greater economic value thanks to the opening of a regional or national market on cashew nuts.

-Transhumant livestock farming, difficult cohabitation between farmers and breeders The occupation of rural areas driven by the artificial planting of trees in the natural environment and

cotton cultivation is most often done without taking into account the need for pasture areas or corridors for access to water for animals.However, the strategy for managing and exploiting animal resources in the commune, as everywhere else, relies heavily on the mobility of herds in time and space. The security context in some areas has increased the arrival of populations and their livestock in search of more peaceful areas.However, to graze cattle, aerial grazing and late bush fires are the means used by these breeders.These practices have negative effects on the regeneration of vegetation (Hountondji, 2008).Breeders are little concerned about the consequences of these practices on late cereal harvests and cotton stored in the fields.This phenomenon also creates recurring conflict situations between farmers and breeders, because of the destruction of crops caused by the passage of animals.In tree plantations as well as cotton farms, these differences between farmers and breeders exist but with much more different proportions.In tree villages, more than 95% of fruit farmers rarely associate breeding (especially large ruminants) with their production system.Thus, conflicts generally occur between tree farmers and the Fulani (mostly breeders from elsewhere).

Photo3 : Herd of cattle wandering through a cashew orchard.

Photo4 : Manure spread in a field, the result of the complicity between farmer and breeder.

2.2 Evolution of land use between 2000 and 2020

The municipality of Kourinion is located in the South Sudanese climate domain which presents assets for agriculture, with in particular a well-marked rainy season which allows a diversity of rainfed and tree crops.Added to this is the fairly favorable level of soil fertility which subsequently leads to the massive influx of foreigners looking for land.Human actions have a strong influence on natural formations.This is not without impact on the organization of the municipality's terroir.

-Land use changes between 2000 and 2020

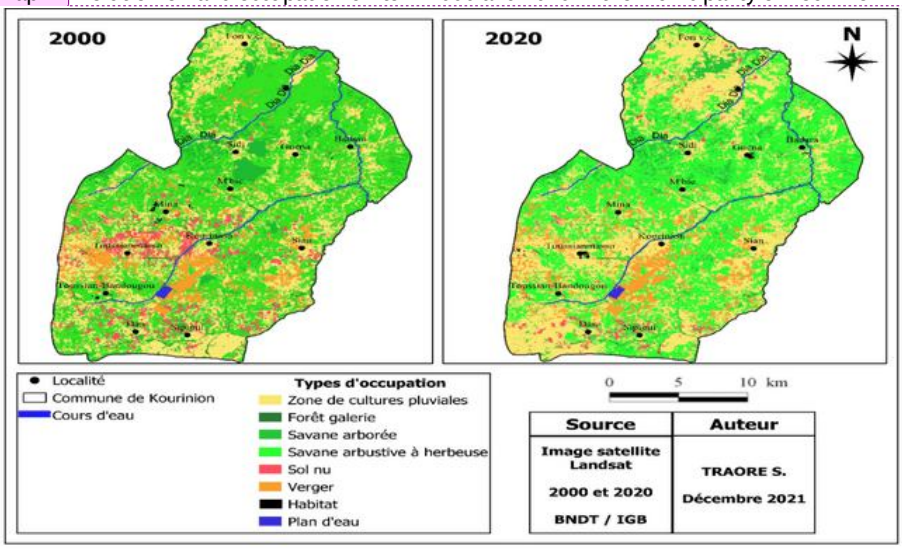
The analysis of the cross-table of occupation states from 2000 to 2020 reveals that out of the eight (08) land use units identified in the study area, three (03) have experienced significant growth.These include rainfed crops (22%), orchards (41%) and residential areas which have increased by 30% from 2000 to 2020. Unlike these formations, others have experienced a decline over time.These are gallery forests with a regression rate of 6%;shrubby and grassy savannahs (20%) and bare soils which have regressed by 246% between 2000 and 2020. This regressive evolution of the surface area of savannahs is linked to the fact that part of the unit

Comment [LT1]: 1. Showing the over all land use change statistics would be more informative. 2. Highlight the process of obtaining the land use change map. Citing some classification methodologies adopted to derive the land use change map.

Comment [LT2]: Need to thoroughly verify the statistic information.

is converted into fields, riparian formations, bodies of water, orchards and bare areas.This dynamic is not without effect on biodiversity.The map below shows us the dynamics of land occupation between 2000 and 2020 in the municipality.

Map 2: Evolution of land occupation units in 2000 and 2020 in the municipality of Kourinion



Comment [LT3]: 1. Need to highlight 8 different types of land use in English.

CONCLUSION

Comment [LT4]: Need to highlight and reinforce clear reasoning of the change of the land use pattern in the region

In the process of land occupations, populations transform their formerly almost unoccupied space into a highly saturated area.The formation of the pioneer front is to be credited to migration.If the search for better living conditions, arable land and climatic constraints are the real reasons for the waves of migration;it has been further exacerbated by the security situation.Populations are looking for more peaceful areas.In general, agro-pastoral activities have considerably degraded the natural resources of this territory and they are further amplified by migratory movements.Thus, in these last waves of migration, in order to meet their current needs, migrants carry out subsistence activities such as the sale of non-timber forest products and wood energy, some also carry out daily work on farms.The analysis of land use data in the municipality showed increases between 2000 and 2020. Orchards (tree plantations) have evolved by 41%, i.e. from 3,927.95 ha to 6,647.31 ha, as well as rainfed crops which occupied 17,771.85 ha have increased to 22,654.25 ha.Housing has also evolved by 30%.However, the vegetation cover has declined by 20% for shrub savannah and 6% for gallery forest.

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