



## Spatial structuring and socio-economic influences of non-agricultural activities in the sub-prefecture of koun-fao (Côte D'Ivoire); A "depauperi zation" sector in a rural area

Armand Koulaï, Aya Louise Kouakou

Department of Geography, Félix Houphouët-Boigny University, Abidjan, Côte d'Ivoire

### Abstract

Although Côte d'Ivoire has a long agrarian tradition, non-agricultural activities have been booming in rural areas since colonial times. Thus, areas considered as regions where agriculture has a considerable hold, are theaters of a remarkable development of the non-agricultural sector which becomes a survival strategy of the rural populations. This is the case of the rural territories of the Koun-Fao sub-prefecture in eastern Côte d'Ivoire. Given the growing scale of these activities, the general objective of this research is to analyze their spatial organization and the socio-economic influences that result from them. To achieve this objective, the methodology adopted is a combination of data collection techniques: documentary research, observation, interviews and surveys by questionnaire with 122 actors of non-agricultural activities in 8 villages (Koto N'ganda, Akrassikro, Yomiankro, Ouatté, Yakrasso, Dokanou, Korïa and Assindi) of the Sub-Prefecture of Koun-Fao. The data collected was processed manually and with the help of computer and cartographic tools. The results of the surveys showed that this activity is present in almost all the villages in the study area. This is a non-agricultural sector that generates income that helps to improve the economic and social living conditions of the population. In short, non-agricultural activities have become very important levers in the fight against "depauperi zation" (poverty) in the rural areas of the Koun-Fao sub-prefecture.

**Keyword:** Non-agricultural activities, koun-fao, depauperi zation

### Introduction

Agriculture has been and remains the driving force behind Côte d'Ivoire's economic and social development, from colonial times to the post-colonial era. According to the World Bank, in 2018, the agricultural sector accounted for 28% of Côte d'Ivoire's GDP and 40% of the country's exports (56% in 2012). The sector employs 46% of the workforce and supports two-thirds of the population. Given the vital role played by the agricultural sector in Côte d'Ivoire's development, the political authorities have encouraged the population to turn to agriculture, which is becoming an essential lever in the fight against poverty and for social development in rural areas. However, with the agricultural crises of the 80s and 90s, combined with the food crises of 2007-2008 (A. A. Adayé, 2021, p 245), the economic world of rural areas underwent a change. The rural economy is no longer the exclusive preserve of agriculture, as rural dwellers engage in numerous non-agricultural activities in the countryside, which are becoming a springboard for the development of terroirs such as those of the Koun-Fao sub-prefecture in eastern Côte d'Ivoire. In this context, they are playing an increasingly important role in the survival strategies of rural populations, to the point of imposing on farmers' organizations which, for a long time, considered them negligible (M. Gueye, 2010, p.19) <sup>[4]</sup>.

In addition, because of the seasonal nature of agriculture and the specialization of certain families, non-agricultural activities have always existed in West Africa in general and in Côte d'Ivoire in particular, in order to meet the sector's demand for the development of product processing activities, advice, transport, sales structures and financing

(Grain De Sel, 2009, p 25). Although indispensable in the rural environment, non-agricultural activities have experienced institutional marginalization in Côte d'Ivoire (Y. F. Kouassi and A. Koulaï, 2018, p 53). Despite this situation, this sector is booming in many regions with a long agrarian tradition, such as the terroirs of the Sous-préfecture of Koun-Fao. In the rural localities of this area, populations that were once predominantly agrarian are gradually turning to non-agricultural activities. With such a scope, the present study investigates the spatial structuring as well as the economic and social influences of non-agricultural activities in the rural environment of the Sous-préfecture of Koun-Fao. In general terms, the aim is to analyze the spatial organization of non-agricultural activities.

### Materials and methods

#### 1. Study area

Established in 1969 by decree N°80-1099, the sub-prefecture of koun-Fao is located 305 km from Abidjan in the north-east of Côte d'Ivoire, in the Gontougo region, and in the Zanzan district. This sub-prefecture according to the RGPH (2014) has 16352 men and 15630 women, i.e. a total of 31982 people. It is bordered to the north by the sub-prefectures of kouassi-datekro, Diamba, Tanda, to the south by Duffrebo, Tankesse, to the east by Transua, and to the west by Bohai and Samanaza (Figure 1). This sub-prefecture is renowned for its ethnic diversity, comprising 4 ethnic groups. This makes it a cosmopolitan sub-prefecture. A predominantly agricultural area, Koun-Fao also has very close trade links with Ghana, due to its proximity to the latter.

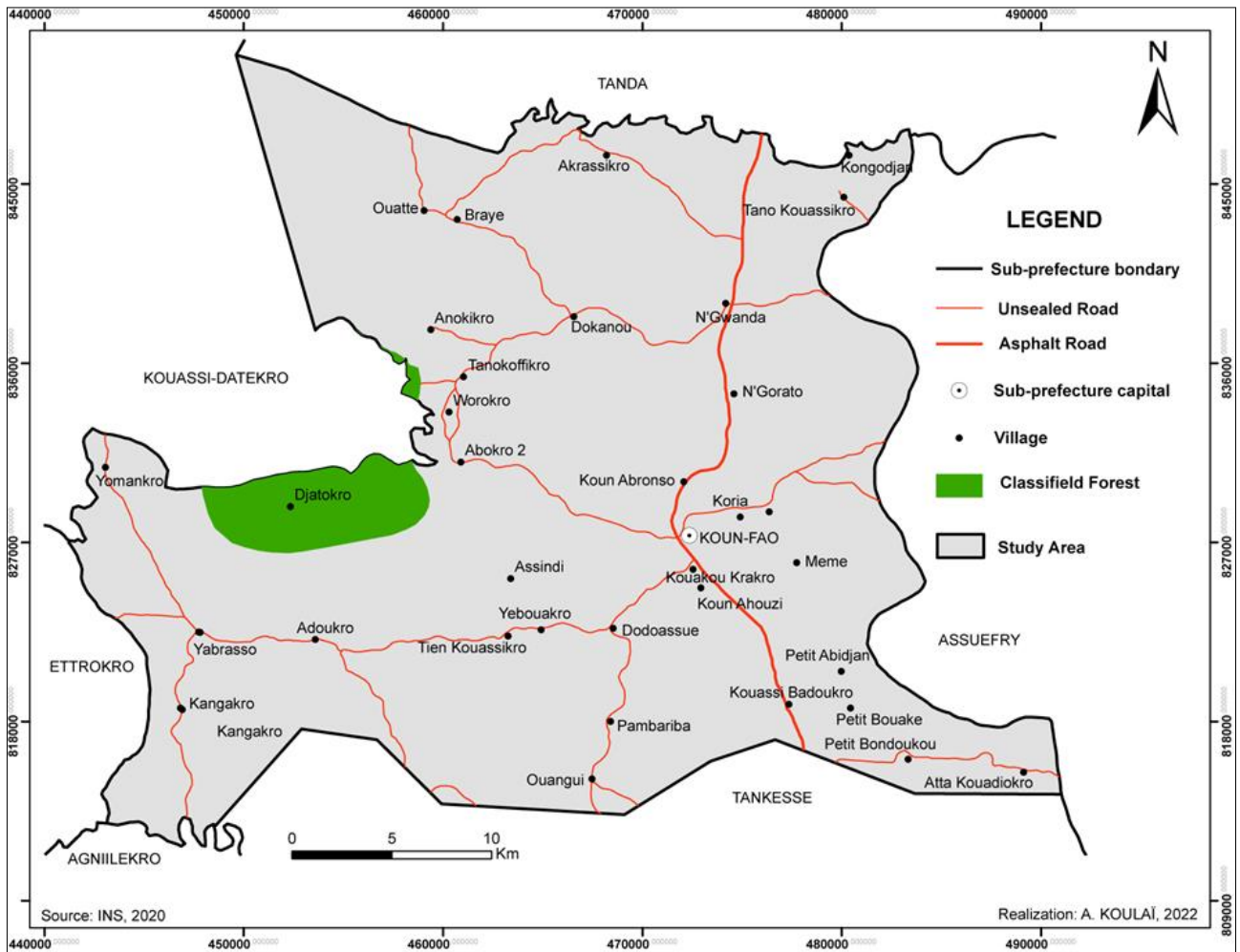


Fig 1: Koun-Fao sub-prefecture overview

**2. Method of data collection**

For the present study, the data collection method revolved around the classic techniques of documentary research, direct observation and interviews, not forgetting field surveys. Documentary research consisted essentially of a search for books and statistical and cartographic documents. Due to the dispersal of documents, works were consulted in several libraries, research centers and institutes. After the documentary research phase, the conditions were ripe for field research, which required prior definition of the survey periods. In the villages of the Sous-préfecture of Koun-Fao, field surveys took place in January and February 2022. This field survey phase began with observation. This took the form of several visits to 8 villages in Koun-Fao, with the aim of closely assessing the spatial structuring and socio-economic effects of non-agricultural activities. In addition to observation, the spatial organization of non-agricultural activities and their economic and social influences necessitated the use of interviews with customary and administrative leaders in the various localities surveyed. In addition to the social and administrative leaders, the study involved a questionnaire survey of 122 mena chiefs, who were also interviewed.

**Results**

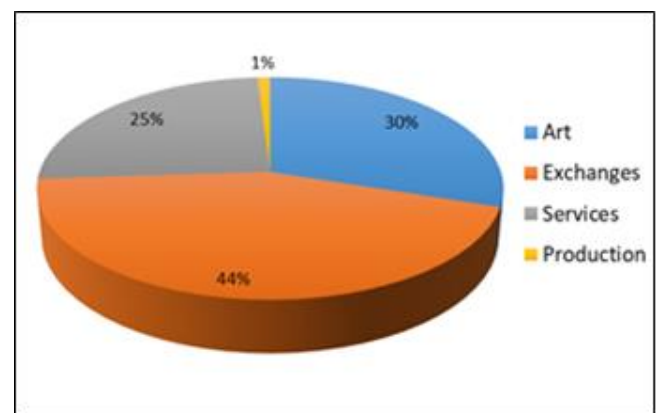
**1. Spatial structuring of non-agricultural activities in Koun-Fao**

The structure of non-agricultural activities in the terroirs of the Sous-préfecture of Koun-Fao is a function of the share

of each activity sector and their spatial distribution in the landscape.

**1.1. Weight of each branch or sector of non-agricultural activity**

Non-agricultural activities in the Sous-préfecture of Koun-Fao are numerous, but categorized into four main branches or sectors (Figure 2).



Source: Personal surveys, 2022

Fig 2: Distribution of Koun-Fao's non-agricultural activities by branch

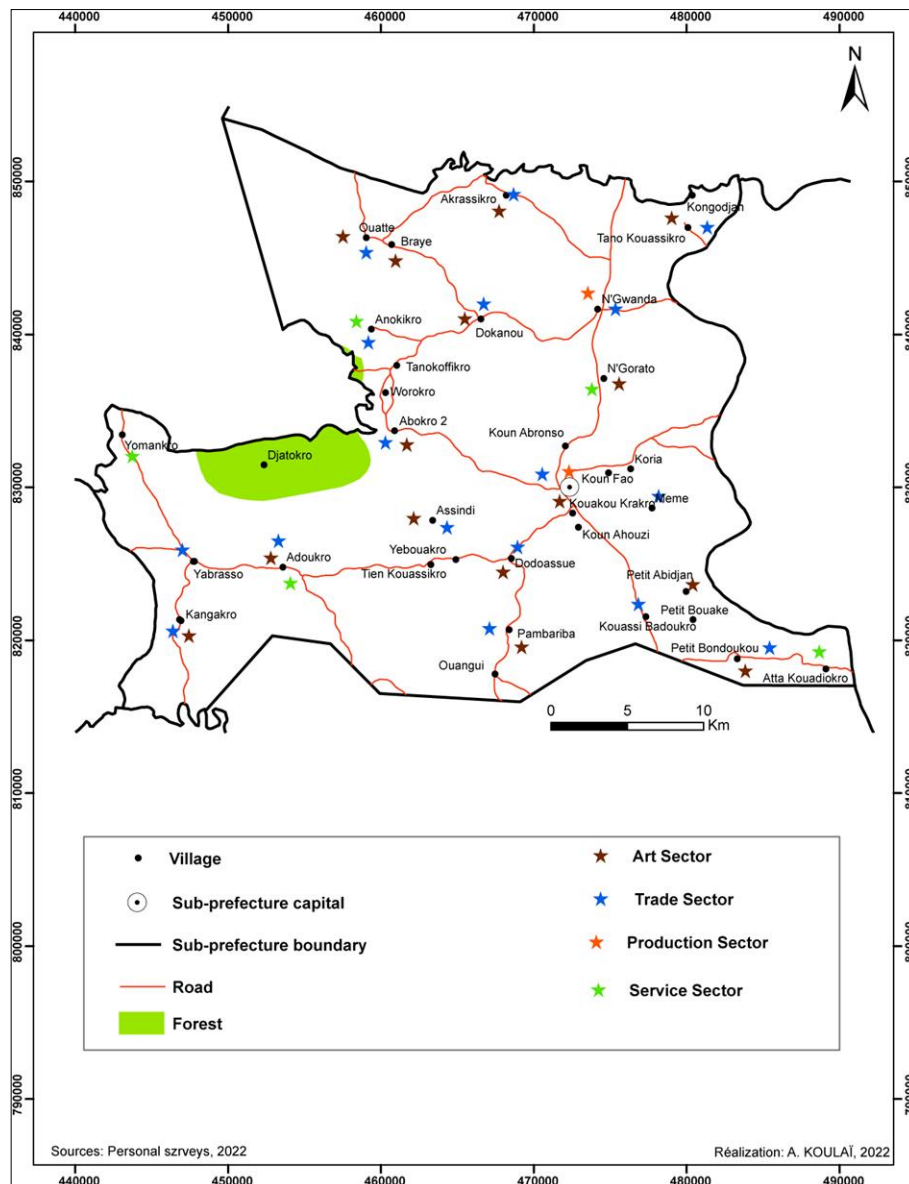
According to figure 2, the trade sector, which includes commerce, is the leading branch, accounting for almost half

of all players. Trade is followed by art-related activities, in this case hairdressing, sewing and handicrafts, which is the second branch with over 30% of non-agricultural players. The service sector, which includes transport, mechanics, masonry and upholstery, accounts for 25% of the population with no connection to agriculture in the Koun-Fao sub-prefecture. The production branch, which includes a few small industrial poultry feed manufacturing units and bakeries, has the smallest share at just 1%.

**1.2. Spatial organization of non-agricultural activities in the Koun-Fao rural landscape**

The organization of non-agricultural activities in the Sous-préfecture of Koun-Fao has been mapped by sector (Figure 3). Generally speaking, this map shows the presence of activities throughout the study area. Of the four non-

agricultural sectors, trade is found in all surveyed localities. In fact, this strong spatial representation of the trade branch is due to the main activity of trade, which is practiced in almost every village. The other branch with a vast spatial representation is art. This is reflected in activities such as hairdressing, sewing and even handicrafts, which are practiced in the majority of localities in the Sous-préfecture of Koun-Fao. The third most important non-agricultural sector in spatial terms is services, led by transport, which remains highly developed in urban areas such as Koun-Fao, the capital of the sub-prefecture. The last branch in terms of spatial occupation is the production sector. Comprising a number of livestock feed manufacturing units and bakeries, the production sector is located in two localities, namely the town of Koun-Fao in the center and the village of N'gwanda in the northeast of the Sous-préfecture.



**Fig 3:** Spatial occupation of non-agricultural activities in Koun-Fao by sector

Non-agricultural activities have different proportions and a marked spatial influence in the Sous-préfecture of Koun-Fao. With reference to the general objective of this work, we also need to understand the economic and social impact of these activities.

**2. Economic and social effects of non-agricultural activities**

The various sectors or branches of non-agricultural activities have economic and social effects on the terroirs of the Sous-préfecture of Koun-Fao.

**2.1. Economic effects: income by sector of activity**

The effects of non-agricultural activities are mainly reflected in the income generated by the four main sectors: trade, art, services and production.

➤ **Level of trade**

The income generated by the trade sector in the Koun-Fao area is mainly reflected in the income from commerce (Table 1).

**Table 1:** Income from commercial activities in the Koun-Fao sub-prefecture

Products	Purchase prices in Ghana	Sales prices in Koun-fao sub-prefecture
2-seater sheet	1000-1300	2000-3000
Motorcycle	250000-300000	350000-400000
Bicycle	25000-30000	38000-45000
Kita loincloth	30000-80000	120000-150000
Shoes	1500-3000	4000-5000
Liquo (carton)	25000 et +	32000 et +

Source: Personal surveys, 2022

According to Table 1, several non-agricultural products or items generate high profit margins. Overall, average profits for the six commercial products in Table 1 hover around 211,100 CFA francs. In detail, however, there are wide variations between product profits. For example, the motorcycle and kita loincloth trades have the highest average earnings, with 100,000 F CFA for the former and 80,000 F CFA for the latter. Bicycles and liquor are the middle-income products, at 14,000 F CFA and 13,500 F CFA respectively. Low-income trade items remain shoes and bed linen. These two products have average incomes of around 2,250 F CFA per pair of shoes sold, and 1,350 F CFA per unit of bed sheet sold in the markets of the Koun-Fao sub-prefecture.

➤ **At art level**

Like the trade sector, the art sector generates income in the Koun-Fao terroirs (Table 2).

**Table 2:** Income from the art sector in the Sous-préfecture of Koun-Fao

Activitis	Monthey income (F CFA)			
	20 000-45 000	45 000-70000	70 000-120000	120 000-150 000
Hairstyg	02	10	04	02
Sewing	04	13	05	00
Crafts	00	02	02	01

Source: Personal surveys, 2022

According to Table 2, the various art-related activities, such as sewing, hairdressing and handicrafts, generate high incomes. In sewing, out of 18 people surveyed in four classes, two had a monthly income of 45,000 CFA francs or less. Ten people have an annual income of between 45,000 and 70,000 CFA francs, and 04 people have incomes of between 70,000 and 120,000 CFA francs. Two (02) people have a monthly income of between 120,000 F CFA and 150,000 F CFA. Hairdressing is a traditional activity, except in the town of koun-fao. To this end, the 05 people with incomes between 70000-120000 reside in the town of koun-fao. They have fully equipped hair salons. On the other hand, people with incomes between 20,000 F CFA and 4,500,000 F CFA and 450,000 F CFA and 70,000 F CFA

are mostly those who practice hairdressing as a secondary activity. Handicrafts generate substantial income for those who practice them. During the surveys, of the 05 people counted, one has a monthly income of between 45,000 F CFA and 70,000 F CFA, 03 people have incomes of between 70,000 F CFA and 120,000 F CFA and 01 person has an income of 150,000 F CFA.

➤ **Production**

Production-related activities enable a significant portion of the population of the koun-fao sub-prefecture to live on their income (Table 3).

**Table 3:** Income from the production sector in the Koun-Fao sub-prefecture

Activities	Gross monthly income	Monthly load	Net monthly income
Factory	5 600 000	1 040000	4 560 000
Bakery	10 860 000	4 340000	6 520 000
<b>Total</b>	<b>16 460 000</b>	<b>6 380000</b>	<b>11 080 000</b>

Source: Personal surveys, 2022

According to the data in Table 3, both production sector activities generate substantial revenues. Net revenues from industrial units and bakeries range from over 4 million to over 6 million per month. In detail, however, it is the bakeries that generate the highest net monthly income, close to 7 million.

➤ **At service level**

Like the other non-agricultural sectors, the service sector, which encompasses activities such as masonry, mechanics, upholstery and, above all, transport, generates significant income for the populations concerned (Tables 4 and 5).

**Table 4:** Income from the service sector in the Koun-Fao sub-prefecture

Activities	Monthly income (F CFA)				
	20 000-45 000	45 000-70 000	70 000-120 000	120 000-150 000	150 000-250 000
Maonry	0	3	5	4	2
Carpentry	0	3	7	2	0
Upholstery	0	0	1	3	0
Mechanics	2	2	4	6	3

Source: Personal surveys, 2022

According to table 4, the various activities linked to the service sector generally generate revenues ranging from 20,000 F CFA to 25,000 F CFA. In detail, however, masonry workers have incomes ranging from 45,000 F CFA to 70,000 F CFA and from 150,000 F CFA to 250,000 F CFA. Those who earn less in this activity are those whose monthly income is between 45,000 F CFA and 70,000 F CFA. These are people who do not make masonry their main activity. Those who do, earn monthly incomes of up to 200,000 F CFA. Carpenters earn between 70,000 and 120,000 CFA francs. Tapestry is one of the few activities practiced in this sub-prefecture. This activity is only practiced in the town of koun-fao. Despite this situation, tapestry regenerates an income of between 120,000 F CFA and 150,000 F CFA. Mechanics, who repair bicycles, motorcycles and cars, generate different incomes. Bicycle repair generates between 20,000 F CFA and 70,000 F CFA. Motorcycle repairs often generate between 70,000 F CFA and 150,000 F CFA. Vehicle repairs bring in a monthly income of 250,000 F CFA.

**Table 5:** Income from the transport sector in the Koun-Fao sub-prefecture

Destination	Cost of Transport (F CFA)	Number of passengers	Number of Trip/Day	Expenses (F CFA)	Profit (F CFA)
Koun-Fao-Transua	1 000	22	3	20 000	46 000
Koun-Fao-Assindi	1 700	22	3	30 000	82 000
Koun-fao-Ouatté	600	22	4	20 000	32 000
Koun-fao-Yomiankro	1 200	22	3	25 000	54 200
Koun-fao-Akrassikro	1 000	22	3	20 000	46 000
Koun-fao-Yabrasso	1 000	22	3	20 000	46 000
Koun-fao-Dokanou	1 000	22	4	35 000	53 000
Koun-fao-Koria	700	22	4	25 000	36 000
Koun-fao-Koto N'ganda	300	22	2	5 000	28 000
Koun-fao-Abidan	6 100	22	2	60 000	208 200
<b>Total</b>		220	11	200 000	631 400

Source: Personal surveys, 2022

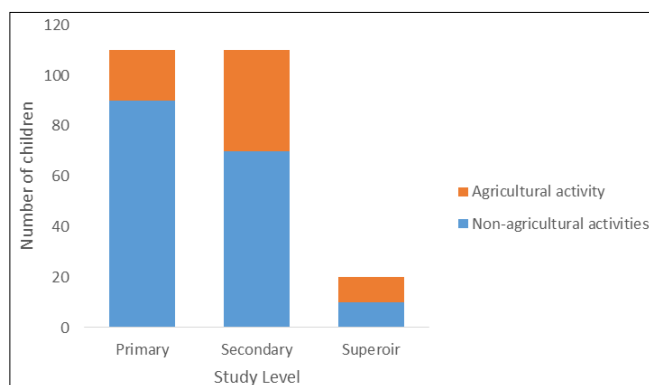
Table 5 shows the different daily incomes generated by the transport sector in the Koun-Fao sub-prefecture. The Koun-Fao-Abidjan route is the one that generates the highest income for the actors, given the framed profits of over 200,000 F CFA per day. The second highest income route is Koun-Fao-Assindi, with more than 80,000 F CFA. The route with the third highest revenue is Koun-Fao-Dokanou with 53,000 F CFA. The route with the lowest net income is Koun-Fao-Koto N'ganda with nearly 30,000 F CFA per day. All in all, survey data show that the transport business generates a minimum daily income of over 20,000 F CFA. This income has enabled the population to improve their social conditions.

**2.2. Social effects of non-agricultural activities in Koun-Fao**

Apart from the economic aspects, non-agricultural activities have social effects on the population of the Koun-Fao sub-prefecture. These effects can be seen in children's schooling, housing, and access to water and electricity.

➤ **On children's school enrolment**

The effects of non-agricultural activities on children's school enrolment were assessed by means of a comparative survey on the number of children enrolled in school by agricultural and non-agricultural players (Figure 4).



Source: Personal surveys, 2022

**Fig 4:** Number of children enrolled in school by agricultural and non-agricultural actors in the Koun-Fao sub-prefecture

Overall, figure 4 shows that children attending school in the sectors are far higher (71%) than those in agriculture (29%). Details by level of education clearly show very high enrolment rates among the children of those involved in non-agricultural activities, with the exception of higher education, where the rates are equal. At primary school level, the proportion of children enrolled by non-agricultural

populations is much higher, at 82%, compared with 18% for the offspring of farmers in the Sous-prefecture of Koun-Fao. The situation is almost the same at secondary level, but with enrolment rates of 64% for children from the non-agricultural sector and 36% for children from households whose main activity is farming.

➤ **Housing**

In the localities of the Koun-Fao sub-prefecture, where non-agricultural activities are booming economically, some actors have been able to considerably improve their homes thanks to their income (photo 1).



Shooting: KOULAÏ, February 2022

**Photo 1:** A villa belonging to a bakery owner in Koto N'ganda, a village in the Sous-prefecture of Koun-Fao

Photo 1 shows a beautiful luxury villa. According to information gathered in the field, this modern house belongs to the owner of the main bakery in the village of Koto N'ganda in the Koun-Fao sub-prefecture.

➤ **Access to drinking water and electricity**

As with housing, the economic benefits of non-agricultural activities have enabled many people to change their way of life through access to drinking water and energy sources (Photo 2 and Photo 3). Photos 2 and 3 show drinking water equipment and solar panels. In the first photo, the human-powered pump was built thanks to the State of Côte d'Ivoire. However, the maintenance or upkeep of this drinking water equipment is carried out by local people, especially those with high incomes from non-agricultural activities. In localities connected to a drinking water network, many non-agricultural households have been able to make their connections thanks to income from their activities. With regard to access to energy sources, photo 2 shows solar panels on the roof of a non-farming household. These

panels, which cost between 30,000 and 100,000 CFA francs each, were purchased with income from non-agricultural activities. Furthermore, in localities connected to the national electricity grid, several non-farming households have been able to take out electricity subscriptions for between 150,000 F CFA and 200,000 F CFA.



Shooting: KOULAI, February 2022

**Photo 2:** A human-powered pump in the village of Assindi



Shooting: KOULAI, February 2022

**Photo 3:** Solar panels on the roof of a non-agricultural household in the village of Dokanou

### Discussion

The results of the land surveys in the Sous-préfecture of Koun-Fao highlight the spatial organization and socio-economic effects of non-agricultural activities. With regard to the spatial organization of non-agricultural activities, the results show a diversity of activities but which are structured into four (4) major sectors or branches. These are art, trade, production and services. This categorization of non-agricultural activities into four branches is based on the work of F. Gohourou *et al* (2020, p. 20) <sup>[3]</sup>, who, as part of their research into informal activities in the Gadouan locality in west-central Côte d'Ivoire, attempted to organize them into four (4) sectors: production, trade, services and art. The division of non-agricultural activities into several

sectors has also been highlighted by E. Baumann (1984, p.41) <sup>[2]</sup>, who, with a few differences, points out that informal units in rural areas of central Sea in Cameroon are made up of three sectors: service, production and trade. Furthermore, P. Hugon (2014, p.19) <sup>[5]</sup> classifies non-agricultural activities as informal in three categories, highlighting the existence of the service group (1), the merchandise production group (2) and the trade and transport group (3).

Although structured into several sectors or branches, these activities are spatially organized according to economic and social logic. These non-agricultural activities are generally found within localities, residential areas and markets. This spatial organization of non-agricultural activities is similar to that of informal activities in San Pedro (Y. L. Kouamé, 2021, p 7). According to this author, they are organized around dwellings, along roads, near industrial zones, etc. These non-agricultural activities have an effect or effect on the environment. These non-agricultural activities have perceptible socio-economic effects or impacts in the terroirs of the Sous-préfecture of Koun-Fao. In this respect, the results indicate a very high school enrolment rate among people working in the non-agricultural sector. As a result, the number of children whose parents are not involved in any agricultural activity remains much higher than those in the agricultural sector. The survey results clearly show that the school enrolment rate for the offspring of non-agricultural workers is over 70%. Such a situation is almost in line with statistics on the regional school enrolment rate, which stands at 73.5% (Institut National de la Statistique, 2019, p.23). Such a level of schooling among the non-agricultural population, especially in the rural area of the Sous-préfecture of Koun-Fao, is not a recurring phenomenon. In fact, studies have generally highlighted a relatively high school enrolment rate among those involved in non-agricultural activities considered informal in urban areas, particularly in large metropolises such as Abidjan (Institut National de la Statistique, 2005, p.16) <sup>[6]</sup> and (A. C. Kobenan, 2022) <sup>[8]</sup>.

In addition to schooling, the results showed that non-agricultural activities have enabled the transformation and modernization of housing in several villages in the Koun-Fao sub-préfecture. The concern for improving the housing conditions of the rural population, especially non-agricultural populations in the study area, is part of a general context initiated by the Ivorian government several decades ago. In this regard, the Ministry of Planning (1966, p.5) mentioned in one of its studies carried out in the Bouaké region of central Côte d'Ivoire, that housing is nowadays the most immediate indicator of the progress of modernism in the rural environment. Thus, when the rural population sees its income from these economic activities increase, its concern is to improve its living environment through housing. It is perhaps this situation that justifies the construction of modern houses by those involved in non-agricultural activities, in this case the owners of bakeries in a number of villages in the Sous-préfecture of Koun-Fao.

The other economic and social spin-off of non-agricultural activities is access to water and electricity. Indeed, survey results indicate that, thanks to their income, a significant proportion of stakeholders have been able to change their source of water supply by switching to running water or by maintaining hydraulic equipment or structures. Access to running water for the rural population of the Sous-préfecture

of Koun-Fao is similar to that observed in the locality of Bonon in west-central Côte d'Ivoire, where F. N. N'guessan *et al* (2018, p. 204) <sup>[12]</sup> reveal that 3.3% of households have access to running water from SODECI (Société de Distribution d'Eau de la Côte d'Ivoire). Moreover, the maintenance of hydraulic equipment or structures by non-agricultural sector actors in Koun-Fao, is similar to the mode of management of drinking water structures developed in the work of W. G. Koukougnon (2021, p. 80) <sup>[10]</sup>, notably delegated village management in the villages of the Sous-préfecture of Agboville in Côte d'Ivoire.

With regard to access to electricity, the surveys show that the majority of non-agricultural actors have been able to obtain electricity through solar energy and subscription. These two forms of lighting for rural households were developed in the research by K. Tano *et al* (2021, p. 213) <sup>[13]</sup>, in which these authors report that households in rural localities in the Zoukougbeu department (central-western Côte d'Ivoire) use several types of lighting, including CIE subscription (34.59%) and solar energy (11.70%).

### Conclusion

A land with a long agrarian tradition, the rural environment of the Sous-préfecture of Koun-Fao has in recent years witnessed the dazzling development of non-agricultural activities, which are positioning themselves as an alternative to the problems facing the agricultural sector. The aim of this research, although focused on this new economic order, was to analyze the spatial structuring of non-agricultural activities, as well as their economic and social influence in the terroirs of the Koun-Fao sub-préfecture. Surveys and analyses revealed that this activity is present in almost every village in the study area. This non-agricultural sector generates income that helps improve the economic and social living conditions of the population. In short, non-agricultural activities have become very important levers in the fight against "depauverization" (poverty) in the rural areas of the Sous-préfecture of Koun-Fao.

### References

1. ADAYE Akoua Assunta. Le manioc une culture de sécurité alimentaire en Côte d'Ivoire, in *La ruralité en contexte africain des années 1960 à aujourd'hui*, ouvrage collectif, l'Hamattan Côte d'Ivoire, 2021, 243-260.
2. Baumann Eveline. *Activités informelles en milieu rural, véhicule de transformations socio-économiques : le cas du centre rural de Sea au centre du Cameroun*, thèse de doctorat de 3<sup>e</sup> cycle en études africaines, Université de Bordeaux, 1984, 357.
3. Gohourou Florent, Kouame Kouadio Arnaud, et YAO-Kouassi Quonan Christian. Acteurs du secteur informel et développement de Gadouan (Centre-ouest de la Côte d'Ivoire), in *DaloGéo*, Université Jean Lourognon Guédé de Daloa, 2020:2(002):25-38. (hal-02900262).
4. Gueye Mohamed. Activités non agricoles et territoires ruraux ; les activités non agricoles sont incontournables, in *Défis Sud*, n°97, 2010, 19-21.
5. Hugon Philippe. L'« informel » ou la petite production marchande revisités quarante ans après, in *Monde en développement*, n°166, 2014, 17-30. DOI 10.3917/med.166.0017.
6. Institut National de la Statistique (INS). Le secteur informel dans l'agglomération d'Abidjan :

- performance, insertion, perspectives, enquête 1-2-3, 2005, 48.
7. Institut National de la Statistique (INS). Enquête régionale intégrée sur l'emploi et le secteur informel (ERI-ESI) Côte d'Ivoire, 2017, 75.
  8. KOBENAN Appoh Charlesbor. l'économie informelle dans le paysage de la métropole d'Abidjan, in *REGARDSUDS*, n°2, 2022. <https://regardsuds.org/leconomie-informelle-dans-le-paysage-de-la-metropole-d-abidjan>.
  9. Kouame Yao Lambert. San Pédro, deux territoires urbains : le port autonome et la collectivité urbaine ; à la découverte de l'économie informelle deux territoires urbains de San Pédro, 2021, 33.
  10. Koukougnon Wilfried Gautier. gouvernance locale des points de service d'eau potable en milieu rural de la sous-préfecture d'Agboville, in *American Journal of Innovative Research and Applied Science*, 2021,78-87.
  11. Ministère du plan. l'habitat : étude régionale de Bouaké 1962-1964, 1966, 89.
  12. N'guessan N'guessan Francis, KOFFI Yoboué Guy Roger, KOUASSI Konan et ASSI-KAUDJHIS Joseph Pierre. De l'accès à l'eau potable au risque sanitaire dans la Sous-préfecture de Bonon (Centre-Ouest, Côte d'Ivoire), in *Revue Ivoirienne de Géographie des Savanes*, Numéro, 2018, 201-214.
  13. Tano Kouamé, Seidou Coulibaly et Konan Amani Fulgence. L'accès aux services énergétiques dans les localités rurales de la Région du Haut-Sassandra : cas du département Zoukougbeu (Centre-Ouest de la Côte d'Ivoire), in *DaloGéo, revue scientifique spécialisée en Géographie*, Université Jean Lorougnon Guédé, numéro 005, 2021, 203-220.
  14. YAO Kouassi Frédéric et Koulaï Armand. Tissage de bandes de cotonnade en terroir baoulé, un facteur de réduction de la pauvreté en milieu rural, in *Ahôhô*, n°20, 2018, 52-64.