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Industrial Infrastructure and Local Development: The Case of the PK-24 Industrial Zone of Akoupé Zeudji in Côte D' Ivoire

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Abstract

In order to make industrial development one of the main pillars of their economic policy, the Ivorian authorities opted for the industrialization of rural areas at the beginning of independence through the establishment of a number of state and private companies. It is the latter that will be the focus of our attention. This article proposes to study the link between the new PK-24 Industrial Zone of Akoupé Zeudji, located in a rural area near Abidjan, and the development of two localities in the peri-urban countryside of the city, namely AKoupé Zeudji and Attinguié. The methodology was based on documentary research, field observation, an inventory of non-agricultural activities and habitats, an

interview guide administered to industrialists and administrative and customary authorities, and a questionnaire survey of 100 villagers. The results reveal that the new PK-24 Industrial Zone of Akoupé Zeudji has a considerable impact on the localities surveyed at the social, economic, spatial and environmental levels. Indeed, it generates jobs and thus contributes to reducing poverty in these localities. It also improves the quality of life of the population. However, the presence of this industrial infrastructure is at the root of the resurgence of land conflicts on the one hand and contributes to environmental degradation on the other.

Keywords: Ivory Coast, Industrial Infrastructure, Industrial Zone, Local Development, Rural Landscape

1. Introduction

Côte d'Ivoire is known for its economic prosperity based on agriculture. Since 2012, the country has recorded sustained economic growth and has made significant efforts in terms of investment, particularly in the industrial sector (MEER, 2019, p. 38) ^[7]. The structure of industrial activity, consuming space and polluting, is thus competing with agriculture, compromising its sustainability (KOUASSI Y. F. and al., 2019, p. 8) ^[6]. One of the objectives of the Ivorian government's vision was to provide jobs for the population, raise their standard of living and envisage edifying bases for sustainable development (TOH A. and KONE L., 2017, p. 197) ^[12]. In short, industrial structures established in rural areas should bring economic and social development in order to improve the living conditions of the local populations. The PK-24 Industrial Zone (Z.I) in Akoupé Zeudji is part of this approach.

From the above, its presence in the rural environment could thus participate in maintaining a space with diversified functions, by offering the populations, coming from farming families, jobs on the spot or by promoting pluriactivity at the individual or family level (RENARD J., 2005, p. 84). According to estimates by the Ministry of Industry and Mines (2018) ^[8], the PK-24 Z.I of Akoupé Zeudji will generate more than 6000 jobs by 2025. In addition, the number of jobs created by approved industrial investments in Côte d'Ivoire should increase to 5342 in 2022, compared to 3954 in 2021 (CEPICI, 2022) ^[1]. Also, the presence of this industrial infrastructure contributes to the development of non-agricultural economic activities, the income from which has improved the living conditions of the villagers. Under the influence of the Akoupé Zeudji PK-24 industrial zone, there has been a significant transformation of the surveyed localities through the modernization of housing and spatial dynamics. As in all peri-urban countryside, the transition from pure rurality to peri-urbanization is not without difficulties (KOUASSI Y. F. and al., 2019, p. 25) ^[6]. In Akoupé Zeudji and Attinguié, land conflicts are mainly related to the "monopolization" of family land by the state and to land rent. In addition, due to the proximity of the PK-24 industrial zone of Akoupé Zeudji to these villages, polluting industries degrade the environment, nature and the ecological system. In view of the above-mentioned observations, what is the link between the PK-24 Akoupé Zeudji industrial zone and the development of the localities of AKoupé Zeudji and Attinguié? This is the main question that guides this work.

This research will therefore firstly present the evolution of the village population, secondly analyze the contribution of the Akoupé Zeudji PK 24 industrial zone to the socio- economic and spatial development process and thirdly show that this

industrial infrastructure is a factor in the multiplication of land conflicts and environmental degradation.

2. Methods

2.1 Presentation of the Study Area

The spatial framework of this study is the area covered by the whole of the Akoupé Zeudji PK-24 zone and the localities of Akoupé Zeudji and Attinguie (Fig 1). This area is located on the edge of the North Highway in the administrative district of Anyama, less than 20 km from the city of Abidjan. The population is 8749 inhabitants in Akoupé Zeudji and 7294 inhabitants in Attinguie (RGPH, 2014) [3]. The natural environment is characterized by an equatorial climate with rainfall that varies between 1700 and 1800 mm in an average year (VERNIERE M., 1966, p. 7) [13]. Ferralitic soils, with low humus content, where the mineral elements are strongly dissociated. In general, they do not appear to be very suitable for cultivation, but their great quality in this country of extensive agriculture is that they are very easy to work (Op.cit., p. 15).

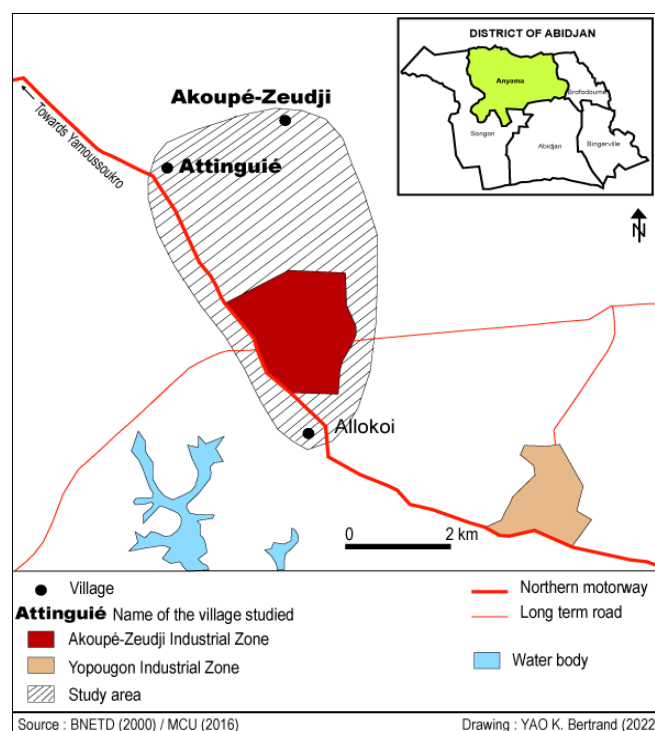


Fig 1: Location map of the study area

2.2 Methodological Approach

The methodology adopted to conduct the work is based on a qualitative and quantitative approach.

The study is supported by a literature review on industrial infrastructure in relation to local development and land conflicts and environmental degradation. Also, for the analysis of the evolution of the population, data from the General Population Census (RGP-1975), the General Population and Housing Census (RGPH-1988) and the General Population and Housing Censuses (RGPH-1998 and 2014 [3]) provided by the National Institute of Statistics (INS) were essential.

The field surveys took place from September to November 2021. The observation allowed us, through several visits to the study area, to appreciate the changes taking place there. As for the inventory, we identified all the non-agricultural activities and habitats built after the creation of the Akoupé

Zeudji PK-24 zone. Subsequently, an interview guide was sent to six industrialists, the Sub-Prefect of Anyama and two village chiefs. The interview items dealt with the branches of activity and the number of new jobs created, the social policy of the industrialists, the reconfiguration of the rural landscape, the modes of access to land and the consequences of the presence of the Akoupé Zeudji PK-24 industrial zone on the living environment of the populations. As for the questionnaire survey, we adopted the reasoned choice method. Thus, we interviewed a total of 100 heads of household (70 in Akoupé Zeudji and 30 in Attinguie according to the demographic weight of each locality). For the analysis of these data, the Sphinx software was used to process the quantitative data. The Adobe Illustrator software was necessary to create the map of the study area and the Excel software was useful to create the graph and tables.

3. Results and Discussion

3.1 Population Change in the Study Villages

Fig 2 below shows the population evolution curve of the village localities of Akoupé Zeudji and Attinguie between 1975 and 2014.

The overall evolution of the population in these two surveyed localities was very clear in the sense of strong growth between 1975 and 1998 and a slight decrease after 1998 until 2014. This situation could be explained by the political crisis of 2011, which led to the non-participation of a category of the population in the 2014 RGPH process. In their study on the housing profile of the Aklomiabla neighborhood in the commune of Koumassi (Abidjan-Côte d'Ivoire), KONAN K. P. and YAO K. B. (2022, p. 110) [5] note that this situation could be explained by the long military-political crisis (from 1999 to 2011), which led to the flight of foreigners from this neighborhood.

Between 1975 and 2014, the number of inhabitants in the village localities surveyed increased from 7925 to 16043, an increase of 102.4% in 39 years. The village localities surveyed experienced the largest increase in 1988 with 3.7%.

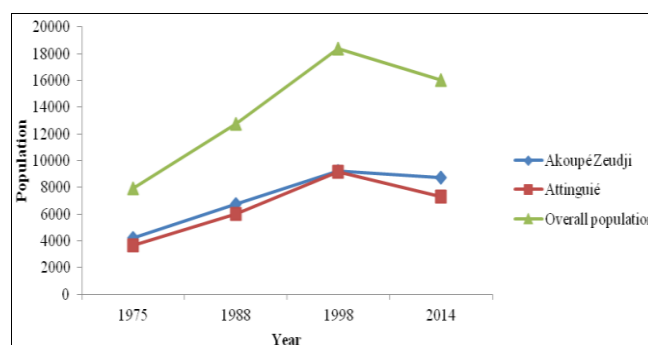


Fig 2: Population growth curve for the localities of Akoupé Zeudji and Attinguie from 1975 to 2014 (RGP 1975 et RGPH 1988-1998-2014)

3.2 The PK-24 Industrial Zone in Akoupé Zeudji, an Industrial Infrastructure Contributing to Socio-Economic Development and Housing Modernization

In this section, the aim is to show the contribution of the Akoupé Zeudji PK-24 industrial zone to socio-economic development and to the spatial dynamics of the habitat in the localities under investigation.

3.2.1 At the Socio-Economic Level

The presence of the Z.I PK-24 of Akoupé Zeudji has allowed the creation of jobs and the development of non-agricultural activities in the localities of Akoupé Zeudji and Attinguié.

3.2.1.1 Job Creation and Social Policy of Manufacturers

Job creation is one of the objectives of development plans focused on industrialization. The industrial enterprises in the study area meet this objective in that they provide jobs. During the field surveys, we noted that these companies recruit an average of 1000 to 1500 employees per year depending on their needs. Of the industrial workforce, 56.5% were employed in the agro-industrial sector, followed by construction and public works (12% of industrial jobs), rubber and plastics (11%), energy (8%), cement and glass (7%) and others (5.5%). These proportions are similar to those of UNIDO (2012, p. 74) in a report on the new industrial policy of the Republic of Côte d'Ivoire. To this end, the report indicates that more than one-third of industrial jobs were in the agro-industrial sector, followed by construction (11.5% of industrial jobs), wood (11%), chemicals (8%), rubber-plastics (7.5%) and textiles and leather (6%). It should also be noted that in the coming months, there may be an increase in the number of employees as some of the companies visited are in the

finishing stage. However, those that are functional already employ the majority of the people who are truly interested. In this sense, we can see that the creation of jobs meets the social needs of the populations of Akoupé Zeudji and Attinguié by reducing poverty and unemployment.

In addition to offering jobs, industrialists, in implementing their social policy, distribute free of charge each year sets of building products (cement, industrial, metal, etc.), agri-food products (brewery) and miscellaneous products (MIPA) to the villagers in order to satisfy their needs. The surveys revealed the existence of a dozen cement factories such as CIMAF, LIMAK Afrika, GUEPARD Cement, etc. As a result, there is a proliferation of cement stores in the villages surveyed. This situation is beneficial to these rural populations since the price of cement in these localities has been reduced from 10.05 USD to 5.87 USD for certain qualities and from 10.89 USD to 6.70 USD for others.

3.2.1.2 Development of Non-Agricultural Activities

The creation of the Akoupé Zeudji PK-24 industrial zone was the basis for the diversification of economic activities in the survey area. The populations of Akoupé Zeudji and Attinguié, who were originally farmers, have turned away from agriculture in favor of other economic activities such as trade, handicrafts, real estate management, transportation and others (Table 1).

Table 1: Typology and rate of increase of non-farm activities in the study area

Types of economic activities	Before the creation of the Z.I PK-24 of Akoupé Zeudji		After the creation of the Z.I PK-24 of Akoupé Zeudji		Rate of increase
	n	%	n	%	%
Trade	27	60.0	84	46.2	211.1
Handicraft	12	26.7	63	34.6	425.0
Real Estate Management	0	00.0	8	4.4	-
Transport	1	2.2	3	1.6	200.0
Other non-agricultural activities	5	11.1	24	13.2	380.0
Total	45	100.0	182	100.0	304.4

Source: Data from chiefdom secretariats and field surveys, 2021; n: Size; %: Percentage

The field survey made it possible to count 182 people integrated in various economic activities after the creation of the PK-24 industrial zone of Akoupé Zeudji (held by 62.50% men and 37.50% women) against 45 before the creation of this industrial infrastructure, i.e., an increase rate of 304.4%. WADJA J-B and YAO K. B. (2020, p. 136)^[14] in their study on artisanal activities in the socio-economic and spatial dynamism of Marcory zone 4 also note this predominance of the male sex (59.39% of men against 40.61% of women). This predominance of the male gender is also noted by GOGBE T. and al., (2016, p. 4) in their study on economic activities and urban disorder in Akeikoi. To this effect, they indicate 60.50% of male actors who intervene in this sector.

The presence of the Akoupé Zeudji PK-24 industrial zone has led to an overall increase of 304.4% in non-agricultural activities in Akoupé Zeudji and Attinguié. With an increase of 425.0%, handicrafts is the most developed type of activity in the study area, followed by other non-agricultural activities (380.0%), trade (211.1%) and transport (200.0%). As for real estate agencies, they were introduced after the creation of Z.I PK-24 of Akoupé Zeudji. Handicrafts include

the repair and manufacture of objects or foodstuffs, mainly cassava couscous commonly known as "Attiéké" (GOGBE T. and al., 2016, p. 5). Trade refers to the sale of various consumer goods and foods in closed or open spaces, (Op.cit.). Other non-agricultural activities include ICT and printing including cyber cafes and phone booths. The income from these non-agricultural activities has helped to improve the living conditions of the villagers.

3.2.2 At the Habitat Level

The presence of the Akoupé Zeudji PK-24 zone has led the landowners of Akoupé-Zeudji and Attinguié to create new subdivisions, resulting in the creation of the Akoupé-Zeudji extension and Attinguié extension districts. Thus, these villages have seen their surface areas double (KOUASSI Y. F. and al., 2019, p. 21)^[6].

Today, we are witnessing a reconfiguration of the rural landscape with the construction of modern housing. Indeed, in order to meet the growing demand for housing, heads of households have built dwellings in these rural areas (Table 2).

Table 2: Housing typology in the study area after the creation of the PK-24 Akoupé Zeudji industrial zone

Types of habitats	n	%
High standing	7	4.2
Villa	28	16.7
Apartment building	7	4.2
Simple house	106	63.5
Banded house	11	6.6
Common courses	8	4.8
Study area as a whole	167	100.0

Source: Field surveys, 2021; n: Size; %: Percentage

Table 2 above shows that in the village localities of Akoupé Zeudji and Attinguié, 167 modern dwellings were built after the creation of the Akoupé Zeudji PK-24 industrial zone, including 7 high-standard dwellings (i.e., 4.2%), 28 villas (i.e., 16.7%), 7 apartment buildings (i.e., 4.2%), 106 simple houses (i.e., 63.5%), 11 strip houses (i.e., 6.6%), and 8 common yards (i.e., 4.8%). This table highlights the predominance of single houses.

High-rise refers to a situation of luxury, high end or high comfort. The apartment building is a building with apartments stacked on top of each other (KONAN K.P. and YAO K.B., 2022, p. 113) [5]. The common courtyard is a group of housing units in a concession. It is built in two forms: the simple (or traditional) common courtyard and the individualized (or privatized) common courtyard (op. cit.). The villa designates an individual type of pavilion dwelling with a garden and an internal garage, (Op.cit.). The strip house is a group of dwellings built on the same lot in a straight alignment forming a strip (KONAN K. P. and ACHO E.T.F., 2020, p. 93) [4]. The simple house is a dwelling that occupies a single lot and does not include a garden or a vehicle garage (Op. cit., p. 94).

Table 3: Distribution of modes of access to land

Locality	Modes d'accès à la terre						Total	%
	By the State	%	Between populations and private operators	%	Between generations	%		
Akoupé Zeudji	3	14.3	7	33.3	3	14.3	13	61.9
Attinguié	1	4.8	5	23.8	2	9.5	8	38.1
Study area as a whole	4	19.1	12	57.1	5	23.8	21	100.0

Source: Field surveys, 2021; %: Percentage

Table 3 above shows that 57.1% of the modes of access to land relate to direct negotiation between populations and private operators. The multiplication of traders, intermediaries and interest groups generates conflicts such as the one between the authorities of Attinguié and the Lebanese (Op.cit., p. 26). 23.8% of the modes of access to land are related to intergenerational settlement. Customary law grants the elders the right to manage land. The youth sometimes violently express their bitterness at what they call the selling off of land by the elders. The parties are difficult to reconcile, since the young people see their future in danger, especially since no possibility of effective conversion to other rural activities is offered to them either by the State or by the companies established (Op.cit.). 19.1% of the modes of access to land relate to the installation of the industrialist by the State. The dispossession of land in the public interest and the slowness in purging customary rights constitute a latent crisis between the populations and the State (Op.cit.).

3.3 The PK-24 ZI of Akoupé Zeudji, Factor of Multiplication of Land Conflicts and Environmental Degradation

Here, we will show firstly that the creation of Z.I PK-24 of Akoupé Zeudji has favored the recrudescence of land conflicts in these rural landscapes and secondly that the waste produced by this industrial infrastructure contributes to the degradation of the environment.

3.3.1 More and More Recurrent Land Conflicts

One of the major problems caused by the presence of the Akoupé Zeudji PK-24 industrial zone is related to land. Farmers whose land has been expropriated by the State for public utility purposes have not been able to create new plantations due to the lack of cultivable land. 45% of heads of household are in this situation. Today, they have no source of income because they have lost their rubber, cocoa and oil palm plantations.

Land rent was also at the root of the shortage of village land. In this regard, the survey revealed that nearly 55% of heads of households live from the sale of land. In their study on industry and the transformation of the rural landscape in Côte d'Ivoire: an analysis based on the new industrial zone of Akoupé-Zeudji near Abidjan, KOUASSI Y. F *et al.*, (2019, p. 23) [6] find that an average of 60% of the population lives on land rent in these rural areas. The purchase price of a lot has risen from 837.87 USD in 2009 to 8378.70 USD, 10054.44 USD or 11730.18 USD five years later depending on its position. The scarcity of arable land has led to an increase in conflicts that stem from the diversity of modes of access to land (Table 3). Three modes of access to land have been identified: the state installs the industrialist, direct negotiation between populations and private operators, and intergenerational installation.

3.3.2 Environmental Degradation

The PK-24 industrial zone in Akoupé Zeudji is a major instrument for the economic and social development of the Autonomous District of Abidjan and even of Côte d'Ivoire, but its presence constitutes a factor of environmental degradation. The growth of industrial activities exacerbates environmental degradation in the surrounding village localities and increases the vulnerability of farmers to natural disasters. Gas discharges into the environment are considered very dangerous for the natural environment. To this end, the Observatoire Régional de la Santé, Rhône-Alpes (2007, p. 1) [9] in a study on the health-environment scorecard, Rhône-Alpes region, indicates that industrial activity is a source of numerous discharges into the various environmental media. It produces waste that is sometimes highly toxic and is the source of technological risks. Atmospheric pollution has a negative impact on the health of the populations living in the vicinity of the Akoupé Zeudji PK-24 industrial zone. The health impact of

industrial activity on the health of the population is also noted by the Observatoire Régional de la Santé, Rhône-Alpes (2007, p. 3) ^[9]. This impact depends on the contaminated environments (water, air and soil), the nature of the risks (related to waste, technological, etc.), the exposure routes (respiratory, digestive and cutaneous), the types of pollutants and their concentrations. The effects are very diverse, ranging from simple olfactory discomfort to the occurrence of cancer.

4. Conclusion

At the end of this research, it is appropriate to say that the PK-24 Z.I. of Akoupé Zeudji, located in a rural area, gives the population hope for development. This hope raises the fundamental question of the impact of this development structure in improving the living conditions of rural populations. The Akoupé Zeudji PK-24 development zone has contributed to socio-economic development and to the spatial dynamics of the habitat in the localities under investigation. However, its presence has favored the resurgence of land conflicts in these rural landscapes on the one hand, and on the other hand, the growth of industrial activities has exacerbated environmental degradation in the villages of Akoupé Zeudji and Attinguié and increased the vulnerability of the populations to natural disasters. To remedy this situation, the public authorities should take into account the cultural references and the essential aspirations of the populations in order to promote the development of the village localities where this development structure is present.

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