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COASTAL EROSION AND POPULATION DISPLACEMENT :

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THE CASE OF THE RESETTLED PEOPLE OF DIOUGOP (SAINT-LOUIS) AND DIAKHANOR (PALMARIN) IN SENEGAL

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Emmanuel SECK
Executive Director ENDA ENERGIE, UNFCCC ASEG,an SoEs Expert member

Boubacar Fall
Université Cheikh Anta DIOP
Research Teacher, Expert on Adaptation and climate change

Cheikh Abdou khadre Dieylani DIOP
ENDA ENERGIE
Program Manager Finance Insurance climate risk

Omar CISSE
ENDA ENERGIE
Expert on Adaptation - climate risk

Angélique BAKHOUME
Climate and Health Research Assistant
ENDA ENERGIE

ENDA ENERGIE

Enda Energie
@endaenergie
@endaenergie
Enda Energie

54, rue Carnot, BP 3370, Dakar, Sénégal
(+221) 33 822 24 96 ou (+221) 33 822 59 83
Fax : (+221) 33 821 75 95
enda.energy@endaenergie.org
www.endaenergie.org

SUMMARY

Senegal's coastline is exposed to rising sea levels and many other sudden climatic phenomena, notably exceptional swells and tidal waves, which cause considerable material and immaterial damage along the coast in general and in some coastal localities such as the city of Saint-Louis and particularly the village of Palmarin-Diakhanor.

Indeed, in February 1987 and September 2017, the village of Diakhanor located in the commune of Palmarin on La Petite Côte and the districts of Guet ndar, Goxu Mbathie and Santhiaba located in the commune of Saint-Louis on La Grande Côte were respectively hit by rising sea waters destroying homes, infrastructure, etc. thus impacting the livelihoods of populations. To cope with these impacts, the disaster victims in the village of Diakhanor, although resettled not far from the sea on part of their farmland, moved with their own means, with the support of local and administrative authorities, essentially on the basis of land subdivision.

In contrast to this resettlement model, the residents of Diougop, despite having benefited from the support of a special project financed by the World Bank , were relocated in uncomfortable conditions and far from their place of work.

In addition, the study revealed that the populations of both areas experienced virtually similar difficulties in the wake of the climatic disasters that redefined their way of life and economic trajectory.

However, these problems remain a distant memory for the people of Diakhanor who, thanks to local adaptation initiatives (relocation of housing to land less exposed to coastal erosion and building infrastructure to land less exposed to coastal erosion), have managed to become resilient. Nevertheless, socio-economic challenges remain, notably access to basic social services and the revival of agriculture.

As for the people of Diougop, they are still looking for sustainable solutions for their resilience, despite the social engineering deployed and the financial resources mobilized for this purpose.

Key words: climate disaster, coastal erosion, economic activities, resettlement, economic and non-economic losses, Diakhanor, Diougop, rapid onset events, slow onset events

INTRODUCTION

Coastal erosion is a phenomenon whose causes are both natural and man-made damage, and is likely to be exacerbated by global warming as a result of accelerated sea-level rise. Whereas sea levels rose at a rate of 1.4 mm per year during the first half of the 20th century, they are now expected to rise at a rate of 3.6 mm per year (IPCC Special Report, 2019). According to Paskoff 1998, a worldwide survey showed that around 70% of sandy coastlines are experiencing erosion and recession.

Senegal, with over 700 km of coastline, is no exception to the problem of coastal erosion. Already alarming along its coastline, this erosion is manifesting itself in the destruction of basic residential, hotel and social infrastructure, ecosystems, economic production units (petrol stations, fishing wharves, fish processing sites, salt works, etc.), cultural and religious sites, etc. Very often accentuated by fast-moving events such as tidal waves and swells, this phenomenon affects the living conditions of coastal communities and leads to incalculable losses of socio-economic and cultural goods and services, very often causing the displacement of affected coastal populations. Similar cases occurred over a decade ago in Saint-Louis at Guet Ndar, and Palmarin-Diakhanor.

Most of the studies carried out in the Senegalese coastal zone have focused on the historical evolution of the shoreline (Niang-Diop, 1995; Diaw, 1997; Dieye, 2000; Fall, 2004) or the morpho-sedimentary evolution of beaches on a seasonal scale (NIANG-DIOP, 1995; Fall, 2004; Ndour, 2015; Sagne, 2015; Sarr, 2015; Diadhiou et al., 2016; Sagne et al., 2021).

Unlike slow-onset events, which have been the subject of some studies in the areas in question (Diadhiou et al., 2016; Enda energie, 2010; Sy et al., 2004), there is a lack of literature on studies of loss and damage associated with fast-onset events in the coastal area. The few studies that do exist focus on the impacts of storm surges on beach morphology (SAGNE et al., 2020) or on the vulnerability of the coast in general (Bakhoum et al., 2018). Furthermore, information on the effectiveness of post-disaster responses and the conditions under which affected communities are relocated and resettled is often incomplete or non-existent.

This lack of information on loss and damage associated with fast-moving events in the coastal zone and the assessment of post-disaster responses are the main motivations for this paper, which aims to strengthen the evidence on climatic impacts following the occurrence of marine phenomena (storm swells) and the effectiveness of the responses provided, particularly the conditions for relocating and resettling the populations affected.

The aim of this article is to retrace the displacement process of those affected in Saint-Louis, Palmarin-Diakhanor in order to assess the post-disaster responses and resilience strategies developed by the populations in the face of the impacts of climatic phenomena.

BOX 1: DEFINITION OF KEY CONCEPTS

- Coastal erosion:

Coastal erosion is a natural phenomenon in which the gradual loss of material causes the coast to retreat. Waves, ocean currents, rain and winds are all responsible for this gradual process that shapes coastlines. However, anthropic activity, which plays a major role in altering the sedimentary balance (construction of dams, homes, jetties or port areas, extraction of marine sand from the coast and aggregates from rivers, dredging of sediments in ports, etc.), can accelerate coastal erosion.

Climate change also contributes to this erosion, which, if it continues, poses a threat to facilities and infrastructure. Coastal submersion, which frequently affects areas subject to erosion, also increases the risk of natural disasters such as storms, violent storms, torrential rain, rising sea levels, etc.
Climate-related disasters:
A natural disaster is characterized by the abnormal intensity of a natural agent (flood, mudslide, earthquake, avalanche, drought, etc.) when the usual measures to be taken to prevent this damage could not prevent its occurrence or could not be taken (INSEE, 2016). Disasters can be caused by many types of hazards (see examples below) and can have devastating effects on people and communities (IFRC, 2024). Traditionally, disasters are classified according to the criteria of causal agents, whether natural or anthropogenic (man-made) (GFDRR, 2021). Natural disasters include:

- Geophysical disasters: for example, earthquakes, volcanic eruptions, mass movements (rockfall, landslides, avalanches and subsidence),
- Hydrometeorological disasters: for example, floods, droughts, storms, extreme temperatures, forest fires, etc.
- Biological disasters: for example, epidemics, insect infestations and animal stampedes.

In this study, the focus will be on hydrometeorological disasters including the encroachment of the sea. Thus, under the effect of climate change, these hydrometeorological disasters (floods, hurricanes/typhoons/cyclones, landslides, etc.) will become more and more intense and frequent (IPCC, 2023).

- Displacement of populations

Displacement, which in a sense refers to a change, downgrading, relocation etc. of populations, is caused here by the impacts of coastal erosion in the study areas. To qualify this phenomenon, several terms and concepts are used, if we refer to the analysis carried out by Olivia et al (2008).

These include environmental migration, climate-change-induced migration, environmental or ecological refugee, climate-change-induced migrant and environmentally-forced migrant (to

be rephrased unclearly). However, regardless of the term or definition used to describe this process, often involuntary depopulation is caused by "a slow onset of environmental change or degradation processes" (Olivia et al., 2008), such as coastal erosion. In the case of this study, the communities in the study areas are being forced to leave under the pressure of sea water, which has engulfed both dwellings and socio-economic infrastructures. Whether accompanied or not, the loss of housing and means of subsistence has forced people to begin the process of moving to other, less exposed locations.

- Economic and Non-economic Loss and Damage

Although the concept of Loss and Damage (L&D) is not new, it still suffers from a lack of clear definition and measurability. To date, the United Nations Framework Convention on Climate Change (UNFCCC) does not have an official definition of Loss and Damage (Liselotte Jensen and Paulina Jabczyńska, 2022).

However, the term can refer to the unavoidable effects of climate change that occur despite or in the absence of mitigation and adaptation measures. It is important to emphasize that there are limits to what adaptation can achieve: when tipping points are crossed, the effects of climate change may become unavoidable.

Although research and policy focus on human impacts, loss and damage can occur in both human systems (such as livelihoods) and natural systems (such as biodiversity). In the area of loss and damage to human systems, a distinction is made between economic and non-economic losses.

Loss and damage can be either economic or non-economic:
- economic loss and damage may include the costs of rebuilding infrastructure repeatedly damaged by cyclones or floods, loss of coastal land with destruction of infrastructure (housing, businesses) due to sea level rise and coastal erosion;
- Non-economic loss and damage includes negative effects to which it may be difficult to assign a monetary value. These can include trauma caused by weather extremes and their hazards, loss of life, displacement of communities, loss of history and culture, loss of biodiversity or entire ecosystems (Liselotte Jensen and Paulina Jabczyńska, 2022).

The main difference between the two is that non-economic loss involves assets that are not commonly traded on markets.

The head of advocacy at Care France sums up loss and damage as 'the consequences that cannot be avoided, even if we do everything we can to reduce global warming and adapt to it'.

1. HISTORY OF THE VILLAGES OF DIAKHANOR AND DIOUGOP

In 1987, Diakhanor, also known as Palmarin-Diakhanor, a coastal village on Senegal's Petite Côte, was hit by a tidal wave of rare proportions . Covering the low-lying coastal areas, the phenomenon engulfed a large part of the rural habitat, which is generally precarious and highly exposed to this hazard. Despite community-based adaptation strategies to minimize the economic and non-economic impacts, and the emergency responses provided by the public authorities (ORSEC Plan, Local Development Committee) to limit the consequences inherent to the phenomenon, local populations suffered considerable material and immaterial loss and damage. This situation led to the relocation of the village to its eastern part in 1989, a little further from the sea.

Three decades later, the city of Saint-Louis, in northern Senegal, has also had to contend with the same phenomenon, particularly at the Barbarie strip. The three-hundred-year-old city, which is highly exposed to storm surges, has been regularly hit by exceptional swells since 2010, particularly in the Guet Ndar, Goxu Mbathie and Santhiaba neighbourhoods, resulting in the loss of almost 800 m of shoreline and damaging residential and hotel infrastructure, ecosystems and cultural sites. Significant material damage is regularly recorded and, between 2018 and 2019, more than 315 households were directly affected (SERRP-ADM, 2022). To improve the living conditions of the affected populations, unlike in Diakhanor, the State, in conjunction with the city's local authorities, has undertaken initiatives to build the resilience of the affected population by relocating them in an area less exposed to rising sea levels, specifically Diougop.

In this respect, the State of Senegal signed a financing agreement with the World Bank (WB) for the implementation of the Saint-Louis Emergency Recovery and Resilience Project (SERRP), which eventually enabled the victims to be rehoused from 2018.

Two different accounts of a story of village relocation: Diakhanor and Diougop

The study areas, namely the village of Diakhanor and the commune of Saint-Louis (Goxu Mbathie, Ndar-Toute and Guet Ndar), are unique in that they are located on the coastal fringe and are constantly subject to sea waves. The most common hazards affecting these areas are: (i) coastal erosion, (ii) marine submersion and (iii) fluvial flooding.

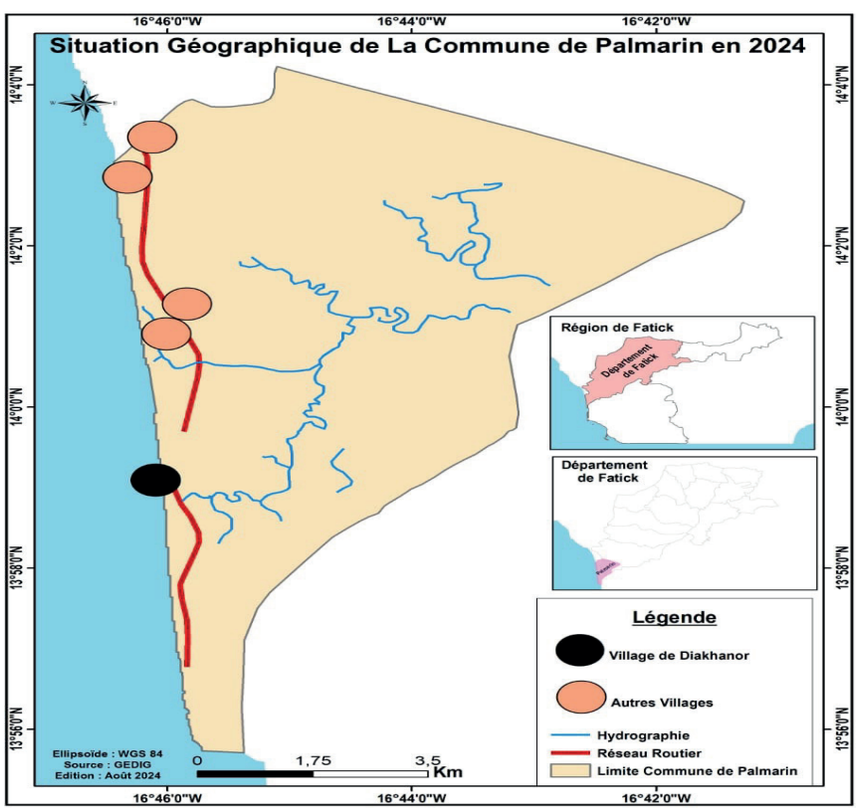
In 1987 and 2010, exceptional swells hit the Diakhanor and Saint-Louis sites respectively. These events destroyed infrastructure, property and homes, disrupted economic activities and had a negative impact on people's lives and health. In both areas, several canoes and fishing piers were damaged during these disastrous events, as well as granaries and salt wells.

2. THE CHALLENGE OF RESETTLEMENT IN THE VILLAGES OF DIAKHANOR AND DIOUGOP

2.1. Palmarin-Diakhanor: the fragility of a coastal village

Located in the south-west of Senegal's Petite Côte, in the commune of Palmarin in the Fatick region, the village of Diakhanor is around 160 km south of Dakar. Inhabited by Serer fishermen, Diakhanor had a population of 416 inhabitants in 1998 , with economic activities dominated by fishing, agriculture and salt extraction. Because of its position far up the coast and its low altitude, the village is highly exposed to coastal erosion and rising sea levels.

Figure 1: Location of the village of Diakhanor in the commune of Palmarin



On the morning of February 27th 1987, the village of Diakhanor was engulfed by the sudden rise of the sea. This tidal wave caused considerable material damage, estimated at over 200 houses and social (hydraulic and religious) and economic infrastructures (landing quay and salt wells). The phenomenon also affected rice and millet fields, without sparing the granaries, which were mainly filled with produce from the same year's harvest. There was also the destruction of fishing infrastructure and equipment (fishing quays, shelters for preparing fishing nets, canoes, engines), as well as cultural and religious heritage (chapels, mosques, libation shrines) and the flooding of salt pans. This situation has undermined the economic activities of Diakhanor and affected the resilience of the local population, who are essentially becoming 'homeless'. Added to these difficulties is the fact that the village is cut off from the rest of the country by the closure of the

Palmarin - Djifer road (the only asphalted road), which used to make it easier for people from the island communities to travel to Diakhanor and sell their fish products inland.

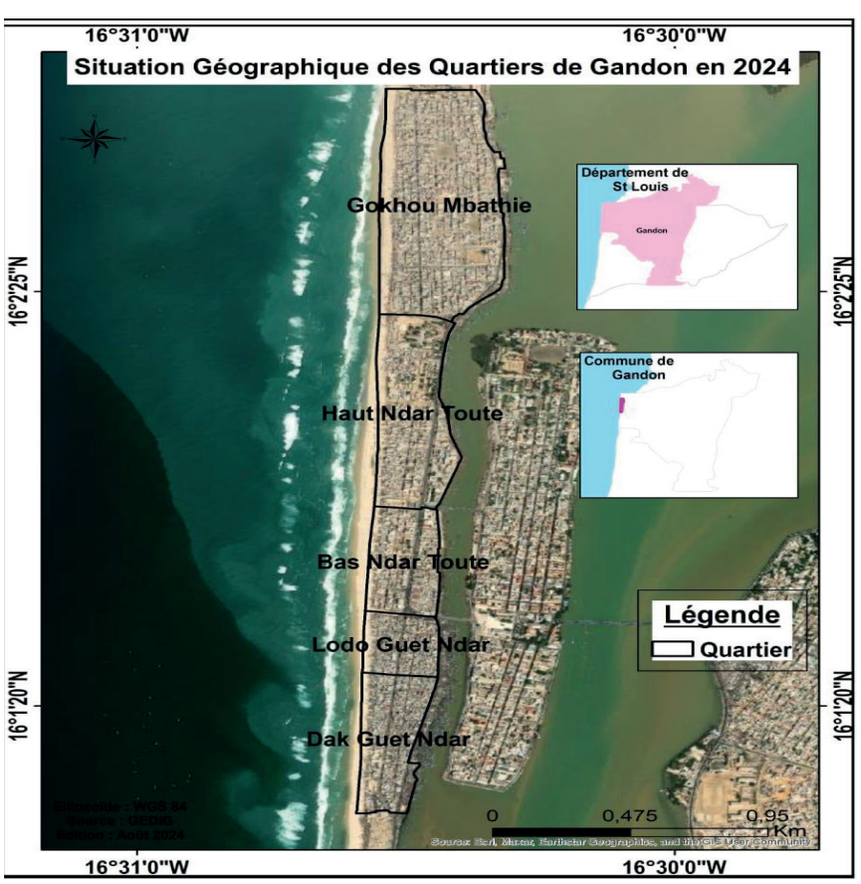
Faced with this situation of brutal shock, considered as a disaster, the local people developed emergency responses with the support of the neighbouring villages and religious authorities, in particular the parish of Palmarin, by transferring vulnerable groups (children and women) to less exposed places (Ngounoumane and the church). As for the adults, they spent the night of the 27th February 1987 under the stars trying to save the rest of their belongings.

As for the efforts of the public authorities, these were limited to the distribution of foodstuffs, in particular rice, following donations from Caritas (food paste, blankets, soap, sheets, etc.), distributed by the parish priest. After living for two years in the compounds of neighbouring relatives and the rest of the houses on the former site, the victims were rehoused with the support of the local and administrative authorities in the eastern part of the village on a plot of land formerly used for rain-fed crops.

2.2. The Barbarie strip: the permanent threat of coastal erosion

Three decades later (18 August 2017), a similar phenomenon struck the Barbarie strip in Saint-Louis, causing social impacts (destruction of houses, health centres, schools, places of worship) and economic impacts (loss of fishing equipment, landing quays and markets). Out of a total population of 329,190 (Saint-Louis department, 2017), 315 households in Guet Ndar, Goxu Mbathie and Santhiaba were affected.

Figure 2: Location of affected neighbourhoods and the commune of Gandon in the Saint Louis region



The victims of the disaster were initially housed at the Cheikh Touré primary schools in Guet Ndar until the start of the school year, then they were transferred to a site located around ten kilometers off the east of the city of Saint-Louis, near the Khar Yalla district. A non aedificandi transit site (not suitable for building, flooded by rainwater) according to the environmental vulnerability study, which characterized it as a mudflat with clayey soil where there was no sewage or rainwater drainage system. It was an ideal place for the development of diseases such as faecal peril and diarrhea, which more often affect children. In addition, the health vulnerability of the resettlement site was exacerbated by the lack of a local health centre, forcing the resettled residents to go to the Khor health centre, located around 2km from the site.

On the whole, access to basic social services was very poor. Initially, the site had no latrines and was not connected to the water supply network. Since February 2018, six latrines were built on either side of the road and electricity poles were installed to provide street lighting. However, there was no electricity inside the tents.

Picture 1: Cheikh Touré elementary school destroyed by the advancing sea in 2018

To relieve those affected population, the State and local authorities launched the 'Projet de Relèvement d'Urgence et de Résilience à Saint-Louis [SERRP], (Emergency Recovery and Resilience Project) which, in an emergency phase, planned to temporarily relocate and resettle the victims (315 households) from the Barbarie strip to Diougop.

Table 1: Number of households displaced during the two waves

Number of households of the Barbarie strip	320 664*
Number of households during the first wave of deplaced population (2016)/ Khar Yalla resettlement site	64**
Number of households during the second wave (2018) / Khar Yalla and Diougop resettlement sites	259***

Sources :
- *** National Agency for Statistics and Demography (ANSD)**
- **** Authors**
- ***** Municipal Development Agency (ADM).**

2.3. Two distinct and sometimes difficult resettlement processes and conditions

Following these disasters, adaptation measures were taken either by the central government in conjunction with the municipal authorities or by the communities. However, the spontaneous or long-term strategies for resettling climate victims were not similar in the two areas.

In Saint-Louis, the process of relocating disaster victims was based on a government initiative, whereas in Diakhanor, the village was relocated using community resources with the support of local and religious authorities.

2.4. The community, alone, in front of the reconstruction challenge

The entire village of Diakhanor was displaced in 1989 when the floodwaters rose, leading to difficult living conditions for the local people, who were left homeless and their granaries destroyed. This vulnerability doubly increased by the destruction of material and goods (housing, foodstuffs, work equipment, etc.), also increased thereby the poverty of the population through the loss of livelihoods and jobs. Although the authorities (central and local) supported the displaced people in obtaining new plots of land through a subdivision and/or alignment project, the new houses were built by the disaster victims themselves several years after the disaster. However, the solidarity of the affected population was crucial during the displacement.

For two years (between 1987 and 1989), people lived in the homes of their relatives in the surrounding villages. It was in 1989 that the victims returned to the site, which had been allocated by the State, without any accompanying measures. During the first few years of displacement, they lived in makeshift houses built from palisades (rods and wood). It was only a few years later that these precarious dwellings were rebuilt by the owners themselves. At the time of displacement, the site had no electricity, drinking water or basic social infrastructure. In contrast to the Diougop model, this process has not received any support from the Senegalese government.

Picture 2: The village of Diakhanor today

2.5. Fragile support from public authorities in the northern zone

The Diougop model was implemented by the public authorities with the support of the World Bank through an initial loan of 15 million US dollars via the SERRP project for the construction of mobile housing units (MHU) on a serviced site at Diougop, intended for the temporary resettlement of disaster victims. Each MHU is occupied by five (5) people from the same family, and each lot consists of 6 tents sharing a common toilet. Even though all the living conditions in Guet Ndar are not met, the site is well lit and has a number of services, including a primary school. However, inside the tents, lighting is provided by solar kits, with an insufficient power to operate other equipment, while daily temperatures can sometimes be very high, affecting the health of vulnerable people, particularly the elderly.

Picture 3: MHU of the Diougop temporary resettlement site

With a view to restoring the economic, social and cultural rights of the Diougop resettlers in a sustainable manner, the State of Senegal and the International Development Association (IDA) have signed another Financing Agreement for a total cost of thirty-five (35) million US dollars for a period of five (05) years (2018-2023) to implement the second phase of the Saint-Louis Emergency Recovery and Resilience Project (SERRP).

The SERRP obtained additional funding of fifty million (50,000,000) US dollars on 16 December 2020, on the one hand to fill the funding gap recorded during preparation (15 million dollars) and on the other hand to strengthen some components to enable better achievement of the expected results (ADM, 2022).

At local level, the initiative is coordinated by the Municipal Development Agency, with technical support from the Regional Development Agency (ARD) of Saint-Louis. It aims to strengthen the resilience of the affected populations through the construction of a new housing estate comprising 367 villas divided into three built-up lots on a surface area of 14.21 ha, handed over by the sister commune of Gandon.

Table 2 : Development of the permanent resettlement site of Diougop

	Number	Area in m²	Total in ha	% Land occupation
Surface area of the site	1	142 128,2	14,21	
Plot of land				
Plots of 150 m²	361	54 149,8	5,41	
Plots of 151 to 160 m²	8	1 252,4	0,13	
Plots of 161 to 200 m²	59	9 727,2	0,97	
Plots of 201 to 250 m²	10	2 273,8	0,23	
Plots of more than 250 m²	4	1 113,5	0,11	
Total of plots	442	68 516,7	6,85	48%
Equipment zone				
Market	1	3 482,1	0,35	
School	1	1 946,6	0,19	
Health centre	1	1 108,3	0,11	
Mosque	1	2 450,0	0,24	
Youth centre	1	2 346,9	0,23	
Total equipment	5	11 333,9	1,13	8%
Green space / public square				
Green space	17	3 326,8	0,33	
Public square	2	4 482,3	0,45	
Total green area	19	7 809,076	0,78	6%
Roads and open spaces	1	54 468,5	5,45	38%

Source : Study to identify, analyze and develop the resettlement site (ADM)

The standard accommodation is a ground floor house with four (4) bedrooms, one (1) living room and one (1) kitchen. The ground floor + 1 type house has eight (8) bedrooms, two (2) living rooms and two (2) kitchens, and the ground floor + 2 house has twelve (12) bedrooms, three (3) living rooms and two (2) kitchens. This means that disaster victims will benefit from an F5 house, regardless of the size of the plot. Yet surveys conducted as part of the project's environmental and social impact study show that the average occupancy ratio in Gueth Ndar is 15 people per room, with overcrowded compounds, ranging from a minimum of five (5) households to a maximum of twenty (20) households for a house with five (5) rooms. This almost impossible cohabitation can be a source of family conflict.

Picture 4 : The new Diougop housing estate

Among the activities planned by the SERRP is the creation of a safety strip of 20 metres wide and 3.6 kilometres long on the Barbarie strip, between the ocean and the districts of Guet Ndar, Ndar Toute and Goxu Mbathie. The initiative is motivated by the need to secure people's possessions by strategically positioning people living on the seafront in order to reduce the damage caused by the advancing sea . However, the households targeted by this measure have been given preferential treatment compared with disaster victims in terms of resettlement conditions and procedures. In accordance with the principles of eviction in the public interest, all those affected received compensation commensurate with the damage caused. In fact, for each household relocated, the number of rooms in the new home is equal to that in the old home.

3. THE SOCIO-ECONOMIC CONSEQUENCES OF DISPLACEMENT

The impact of the sudden climatic events on the economic activities and sociological realities of the inhabitants of Diakhanor and the Barbarie strip was a destabilizing factor in the cultural and religious practices of the victims, but also a major factor in the re-composition of an increasingly vulnerable socio-economic context. In the two areas studied, the impact of these sudden climatic events was particularly disastrous. Two different adaptation situations that call for re-training in other occupations or, quite simply, the abandonment of certain activities that are not suited to the host land and that once contributed to the resilience of the disaster victims.

3.1. Disruptions of economic activities with variable geometry

Given its openness towards the Atlantic seaboard, fishing is the dominant economic activity in the Barbarie strip. Considerable income is generated by this activity, which employs most of the population of the traditional districts of Guet Ndar, Goxu Mbathie and Santhiaba (fishermen, fish merchants, processors of fish products, carpenters, etc.). In these districts, sea fishing is an important pillar of the local economy and a vital element in both social and food terms. Indeed, it is the primary source of job creation and it generated an average fish landing volume of 52,825.8 tons between 2013 and 2018, made by 5,303 pirogues, including 3,275 from Guet Ndar and Goxu Mbathie (Regional Fisheries Service, Saint-Louis - 2019).

However, out of a population estimated at more than 40,000 inhabitants (AFD/BRLi, 2018) living on the Barbarie strip (Goxu Mbathie, Ndar Toute and Guet Ndar), 15,000 inhabitants, or 37.5%, were forced by coastal erosion to move to Diougop by the end of 2023. On the one hand, this situation has led to major disruptions to the fishing value chain, and on the other, it has had a negative knock-on effect on other sectors of the local economy in particular.

Most of those resettled continued to carry out their activities in Guet Ndar, where they go every day in the morning and only return in the evening. The only accessible means of mobility was public transport (minibuses), operating between 8 am and 8 pm. Beyond these times, there was no regular rotation for the buses managed by an economic interest grouping (GIE), AFTU, which held the monopoly in the city of Saint-Louis. Travel within the city was by taxi and the fare of (2,000 FCFA/day) did not seem to be affordable for everyone.

SEYNABOU
Resident of Cité Diougop
President of the women's group

As women, the abandonment of our former activities on the seashore, very close to our homes, (fishing, processing and selling fish products) has greatly contributed to the decline in our financial income. It's an unfavorable situation we're all experiencing, and one that makes it hard for women and girls to adapt to other income-generating activities. To facilitate this reconversion to other trades, we need more support and follow-up for women in terms of capacity building in other activities such as processing cereal products, finishing the construction of the market to facilitate trade, and so on.

For me, one of the solutions to this precarious economic situation would be to give priority to individual financial support for each woman, rather than group support. Our experience of group financing to set up food stores, hairdressing salons and sewing workshops was not viable. The distribution of small profits among a dozen or so women ended up discouraging many of us, who abandoned these activities. We recommend individual funding to enable everyone to pursue activities that will enable them to earn a decent living.

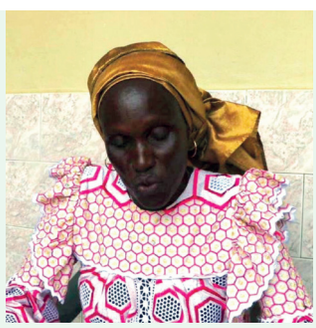
To cope with these mobility problems, the SERRP has set aside a line of funding to provide a GIE of resettled with two (2) minibuses. This initiative was opposed by AFTU, which claimed a monopoly in the urban sector and did not wish to welcome a competitor in its sector. To date, major negotiations are underway at the highest level, without any compromise that is essential for the people who have been evacuated to become economically independent.

At Guet Ndar, in addition to processing activities, the women had space for raising small ruminants. This was an additional activity to meet needs. Now, due to a lack of space, this activity is no longer possible at the resettlement site, contributing to a drop in income which in turn compromises women's economic resilience.

All these factors, combined with the destruction of fishing infrastructure and equipment (canoes, nets, etc.), are partly responsible for the decline in living conditions for fishermen, particularly those resettled in Diougop and Diakhanor. This is leading to a gradual decline in the local economy, making the whole community even more vulnerable. As a result, young people, the main drivers of change and indispensable pillars of local trade, are being forced to switch to other

trades or attempt illegal emigration in search of a better future. This phenomenon has dramatic consequences, especially in the river estuary, where hundreds of illegal immigrants have died in recent years . In December 2018, more than 350 deaths had been recorded since the opening of the breach in 2003 .

In the village of Diakhanor, economic activities are mainly dominated by fishing, agriculture, salt extraction and livestock raising. The economic impacts caused by the displacement have weakened the resilience of the communities, ranging from the loss of activities (decline in agriculture due to the loss of arable land, destruction of canoes and fishing equipment, flooding of salt wells) to exodus, mainly due to the loss of jobs and poverty, and food insecurity. Unlike the Diougop resettlers, the new Diakhanor site is just a few metres from the sea, allowing fishing activities to continue as usual. However, agricultural activity is being impacted by the salinisation of the land, particularly in the lowlands, and by the reduction in farmland due to the construction of the new village on part of the farmlands once occupied by the farmers. Furthermore, there is the flooding of the salt pans, which has led to the abandonment of the village's salt wells, not to mention the livestock sector, particularly extensive livestock, which is faced with a discontinuity in the vegetation cover and wide variations in grazing areas . This has led to a loss of livestock productivity. All these factors contribute to the food insecurity of a population already hard hit by the effort of rebuilding new homes and the destruction of much of its fishing equipment. Faced with this situation, the only reconversion strategies developed by those affected people remain: seafood harvesting for women and illegal immigration for young people, with consequences that are always dramatic at the household level, with loss of human life during maritime journeys to reach Western countries.



MADELEINE
Resident of Diakhanor village

The lack of support is at the root of the exodus of young men and women. Although fishing, in its entire value chain, is the village's main activity, the current context marked by the scarcity of fish resources is contributing to the displacement of people to other areas in search of employment.

In the past, the women of Diakhanor have received financial support and training from various civil society organizations, but today we are asking for more support. We need support to formalize and label the products we produce, which come mainly from the sea (fish products). Such formalization and labeling will enable us to target markets outside the country. In addition, we need fund to support our fishing and processing activities.

3.2. Different social conditions

The fishing district of Guet Ndar covers 17 ha and was home to 25,206 inhabitants in 2011, with an average density of 1,491 inhabitants/ha (National Commission for Decentralized Cooperation, 2011). They were divided into large families or concessions, each of which comprising a minimum of 05 households and a maximum of 20. In some compounds, the number of people living under the same roof can sometimes exceed 80, with an average of 15 people per room . Despite the narrowness of their homes, the members of the Lebou ethnic group are very proud to live in large family compounds, where there is solidarity. In fact, in this space of socialisation, it is often rare to distinguish between low-income and middle-income households, because of the mutual aid in the name of family solidarity. These practices were exacerbated by the break-up of the courtyards in the aftermath of the 2017 swell.

BOX 2: Precarious social and health situations

In addition to these difficulties, the people who have been resettled, particularly the girls, have had to deal with problems of morality. According to some elders, their daughters are often raped during the day on their way home from school. These acts are facilitated by the absence of the parents, who return to Guet Ndar where they spend the day pursuing their economic activities. It was difficult to bring this kind of situation to court, given that the perpetrators were often a family member who would take advantage of the victim's parents' absence during their hours of rest. This phenomenon was less well known externally, but was dealt with internally by the SERRP, which employed a psychologist to provide moral support to victims. In addition there was the emergence of new diseases due to the high temperatures in Diougop, such as malaria and respiratory diseases, which weakened the health of vulnerable people, especially the elderly.

On another level, the fishermen of the Barbarie strip are deeply rooted in a traditional practice known as 'tuur'. This is a cultural rite that takes the place of religion among the Lebou ethnic group, and is performed independently by each family on domestic altars to attract the benevolence of a superior force. This rite, often performed before going to fish, boosts motivation and self-confidence. However, the configuration of the resettlement sites no longer allowed for these practices, which predicted the conditions of the sea and the nature of the catches. Abandoning these rituals could have psychological consequences, particularly for members of the paternal line who practice these rituals.

MAMADOU THIAM

President of the displaced people of the Cité de Diougop

Compared with the Barbarie strip case, living conditions for the disaster victims have deteriorated dramatically. The narrowness of the houses and the number of bedrooms mean that the entire family, which used to share the same house, cannot be accommodated. This complex situation of overcrowding has led to a number of conflicts within the houses, and I am regularly called in to mediate. What's more, because of the cramped conditions, some households with no rooms in the new house have to resort to renting in the surrounding villages, despite the very difficult economic conditions.

Because of the heat, sanitary conditions for the elderly have deteriorated considerably. While the coast offers better thermal conditions due to the sea breeze, the configuration of the rooms does not allow for better ventilation. As a result, all rooms must be ventilated to reduce the heat. A luxury not everyone can afford.

Added to this is the phenomenon of illegal emigration by sea to other countries, notably Europe, and the movement of young girls in search of work in the surrounding areas. This migration is essentially due to the difficult conditions of the fishing industry, with the increasing scarcity of fish stocks, and is accentuated by the lack of activities in the town. In search of employment, young people turn to other practices that have nothing to do with fishing or its value chain, in order to help their parents or husbands provide for their children.

The continuing precariousness of the situation means that fishing is in danger of being abandoned by the displaced populations, who are increasingly turning to other practices (housekeeping in the surrounding villages, washing the inhabitants' clothes for a lump sum, etc.) given the remoteness of the sea.

Like their Lebou relatives, the displaced people from Diakhanor have also suffered cultural losses linked to the disappearance of two gigantic libation baobabs that were sacred sites (Pangol) in the village. Although they were transferred to the resettlement site, these practices are gradually being abandoned, partly due to displacement.

DISCUSSION AND CONCLUSION

Summary of consultations with communities

The populations of the two study areas are all affected by sudden climatic phenomena (tidal waves and/or swells) but to different degrees due to the location of their resettlement sites, which have a knock-on effect on their resilience capacities.

For the inhabitants of Diakhanor, the tidal wave, although an old memory, contributed greatly to the disruption of economic activities, particularly fishing, agriculture and salt extraction. On the other hand, it has given impetus to retraining activities for women, mainly in seafood processing. In addition, households have made remarkable efforts to rebuild their homes without waiting for support from the public authorities or social partners. A heroic act for this Serer community, which is proud of the scale of the investment made by the members themselves to rebuild the village, estimated at 452,381,700 FCFA (ENDA ENERGIE, 2010).

In Diougop, from temporary resettlement to the construction of the new town, temporary and long-term measures have been taken by the public authorities to improve the living conditions of the 2017 disaster victims in the Barbarie strip. These efforts are certainly commendable, but they have objective limits, particularly in terms of the narrowness of the houses (one F5 house/plot of 150 m2) on the final resettlement site, that are to accommodate the disaster-stricken families. In the old houses, each household had at least one bedroom, which is not the case in the new, very narrow dwellings. This is an uncomfortable and awkward situation for the families, and a potential source of conflict within them.

In addition to this limitation, the distance of the resettlement site from the workplaces (the original neighborhoods) makes life difficult for the new residents of Diougop. This is a constraint that does not make it any easier for young people, future fishermen, to learn to swim, as they are called upon to face the fury of the waves at sea.

Besides these difficulties, those resettled in Diougop are also weakened by the impossibility of consulting the spirits of their ancestors through the 'tuur', which guaranteed them self-confidence before facing some trials in life, particularly those linked to their economic activities and social well-being.

Picture 5 : District of Khaar Yalla

In addition to the problem of acute insalubrity, the households resettled since 2016 still do not own their houses and are not allowed to build additional rooms to accommodate the ever-growing population, or stores to enable young people and women to develop income-generating activities. Added to this is the absence of basic social infrastructure (schools, health facilities, markets, etc.). In spite of this, the local population has taken several steps to obtain a title deed, which is still refused by the local authorities.

After the climatic disaster that occurred 37 years ago, the people of Diakhanor were able to build up their resilience using their own funding mechanisms, unlike the people of Diougop, who have continued to live in unenviable conditions for the past six years, despite the support of the Senegalese government and its financial partners, who have invested a total of 100 million dollars in their resilience.

However, there is a difference in terms of the response at the resettlement sites. In the Saint-Louis area, the first resettlement site had many limitations, as the site chosen to resettle the disaster-stricken populations was a non aedificandi site (flooding, lack of basic social infrastructure, no water or electricity). Solutions that have nevertheless led to a situation of poor adaptation of the communities.

In the village of Diakhanor, despite the meagre resources available during the process, the people were able to build their adaptation over the years. The communities affected by the disaster were able to regain their resilience thanks to the solidarity of the people and the land reserves they had at their disposal, compared with the victims in Diougop, who were struggling to find better living conditions.

Conclusion

This comparative case study presents two different situations of displacement of climatic disaster victims. It highlights the limits of the post-disaster response to enable those affected to recover their former living conditions. In the northern zone, as in the village of Diakhanor, the responses provided to help people rebuild their lives are often almost non-existent, and sometimes derisory. Measures that do not strengthen the social protection of communities in the face of the climatic impacts to which they are highly exposed and vulnerable.

This study also shows the complexity and limitations in knowledge generation about the loss and damage caused by climate change. Causality relations are still very difficult to demonstrate, often due to a lack of documented information (literature and/or statistics). Although swells and tidal waves are often recorded in these impacted areas, the triggering of these natural phenomena (in Saint-Louis and Diakhanor) has not been sufficiently documented and attributed entirely to climate change.

In the future, a study will be carried out on the assessment of loss and damage due to climate change, in order to examine in greater depth the causal links between the impacts of climate change and to define a methodology for assessing loss and damage. The aim is to prepare national decision-makers towards the development of a national strategy on loss and damage, which will be key in the next Nationally Determined Contributions (NDCs). At the same time, discussions will need to be held on how to take greater account of climate change in social protection policies at national level, through funding mechanisms and risk transfer instruments such as insurance.

BIBLIOGRAPHICAL REFERENCES

- Agence de Développement Municipal (ADM), 2022, Rapport actualisation EIES relogement définitif et libération de la bande de 20 mètres SERRP, 294 p.
- Agence Nationale de la Statistique et de la démographie (ANSD), 2016, Rapport Situation économique et sociale régionale, Service régional de la statistoique et de la démographie de Saint Louis, 173 p.
- Agence Nationale de la Statistique et de la démographie (ANSD), 2019, Rapport Situation économique et sociale régionale, Service régional de la statistoique et de la démographie de Saint Louis, 135 p.
- Arnaud Tranchant. Les déplacés du Kenya : étude comparative de trois cas de relocalisation. Science politique. 1997. dumas-01302526, 114 p.
- BAKHOUM P. W., NIANG I., SAMBOU B., et DIAW A T., sept. 2018, « Physical vulnerability of Dakar region facing sea levels rising s in the context of climate change », Environ. Water Sci. Public Health Territ. Intell. J., vol. 2, no 3, 11-26 p.
- DIADHIOU, Y. B., NDOUR A., Niang I., et NIANG-FALL A., 2016, « Étude comparative de l'évolution du trait de côte sur deux flèches sableuses de la Petite Côte (Sénégal) : cas de Joal et de Djiffère », Norois, vol. n° 240, no 3, 25-42 p.
- DIAW A. T., 1997, « Evolution des milieux littoraux du Sénégal. Géomorphologie et Télédétection. », Thèse de Doctorat d'Etat ès Lettres, Université de Paris I / Panthéon - Sorbonne, Paris, 11+270 p.
- DIEYE A., 2000, Traitement informatique de photographies aériennes combiné à l'utilisation de systèmes d'information géographique pour l'étude de J'évolution de la ligne de rivage entre Bel-Air et Rufisque durant la période 1968-1997. Mém. D.E.A, Dpt Géol, Fac Sci. Et Techn., Univ Dakar,47 fig., 13 tab, 64 p.
- DURAND P., ANSELME B., et Thomas Y F., 2010, L'impact de l'ouverture de la brèche dans la langue de Barbarie à Saint-Louis du Sénégal en 2003 : un changement de nature de l'aléa inondation ? Cybergeo : European Journal of Geography [En ligne], Environnement, Nature, Paysage, document 496, URL : http://journals.openedition.org/cybergeo/23017 ; DOI : 10.4000/cybergeo.23017.
- ENDA ENERGIE, Février 2010, Évaluation socio-économique et culturelle de l'érosion côtière à Diakhanor, Rapport d'étude, 94 p.
- FALL B., 2004, « Le littoral de Yoff : évolution morphosédimentaire et changements à long terme de la ligne de rivage. », Thèse de 3ème cycle, Université Cheikh Anta DIOP de Dakar, 165 p, 41 tab, 70 fig, 8 photos.
- Fédération Internationale des sociétés de la Croix-Rouge et du Croissant-Rouge, 2024, Qu'est ce qu'une catastrophe (https://www.ifrc.org/fr/notre-travail/catastrophes-climat-et-crises/quest-ce-quune-catastrophe).
- IPCC, 2023, SIX ASSESSMENT REPORT (AR6) « Climate Change 2023 », Synthésis report, 85 p.

- GIEC, 2019, Résumé à l'intention des décideurs, Rapport spécial du GIEC sur l'océan et la cryosphère dans le contexte du changement climatique [sous la direction de H.-O. Pörtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, M. Nicolai, A. Okem, J. Petzold, B. Rama et N. M. Weyer], sous presse, 33p. https://www.ipcc.ch/site/assets/uploads/sites/3/2020/07/SROCC_SPM_fr.pdf.

- Institut National de la Statistique et des Etudes Economiques, 2016, Catastrophe naturelle, (http://www.statistiques.developpement-durable.gouv.fr).

- KANTE F., et al., 2010, Érosion côtière et déplacement de populations. Étude de cas du site de recasement des sinistrés de la Langue de Barbarie dans la ville de Saint-Louis du Sénégal. Actes d'une journée d'étude environnement, changement climatique et populations : promouvoir le dialogue septembre 2019, 51-53 p.

- JENSEN L., JABCZYŃSKA P., 2022, Understanding Loss and Damage Addressing the unavoidable impacts of climate change, European Parliamentary Research Service, Briefing, 8 p.

- NDOUR A., 2015, « Evolution morphosédimentaire et impacts des ouvrages de protection sur le littoral de Rufisque, Petite Côte, Sénégal. », Thèse de Doctorat Unique, Université Cheikh Anta DIOP de Dakar, 239 p, 43 tab, 93 fig, 20 photos.

- NIANG-DIOP I., 1995, « L'Erosion côtiere sur la Petite Côte du Sénégal à partir de l'exemplede rufisque passe - present - futur », 477 p.

- Olivia DUN et François GEMENNE, 2008, Définir les 'migrations environnementales', Revue Migration forcés, Les changements climatiques et les déplacements, 10-11 p.

- PASKOFF R., 1998, « La crise des plages : pénurie de sédiments », Mappemonde, vol. 4, no 52, 11 15 p.

- Plan d'action de réinstallation des populations et des activités situées sur la bande des 20 mètres de la langue de barbarie à Saint-Louis, Rapport Provisoire - Janvier 2020

- Rapport Etude d'Impact Environnemental et Social de l'aménagement du site de recasement des populations sinistrées de Khar Yalla, août 2018

- Rapport final - EIES Site de Relogement Provisoire - janvier 2018

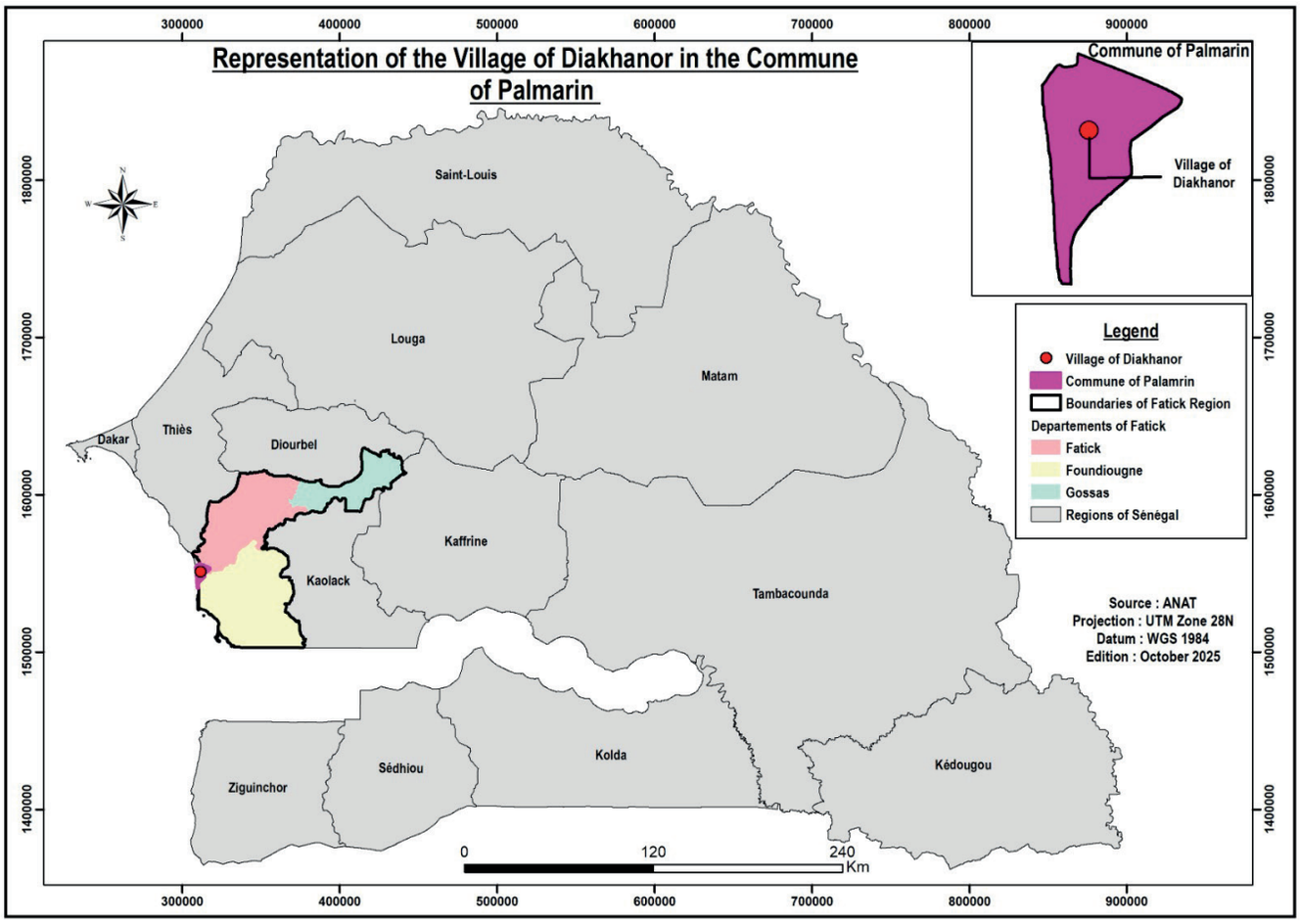
- SAGNE P., FALL B., BÂ K., YOUM J P M., SARR J P G., SOW El H., 2012, : Morphosedimentary evolution of the northern coast of Dakar (Sénégal) : exemple of Guediawaye and Malika beaches. Geo – Eco – Trop., 45, 2 : 283 – 298 p.

- SAGNE P., FALL B., BÂ K., FAYE G., SOW El H., NIANG I., 2020, Impacts of the storm surges on sandy beaches: example of northern coast of Dakar (Senegal); EWASH & TI Journal, Volume 4 Issue 1, 325 – 335 p.

- SARR J. P. G., 2015, « Evolution morphosédimentaire des plages de Mermoz et de l'Université de Dakar d'août 2013 à janvier 2014 », Mémoire de Master 2, Université Cheikh Anta DIOP de Dakar, 64 p.

- SY B.A., 2004, « L'ouverture de la brèche de la Langue de Barbarie et ses conséquences, Approche géomorphologique ». Revue de Géographie de Saint-Louis (RGSL) N°4, 50-60 p.

- Union Economique et Monétaire Ouest Africain (UEMOA), 2010, Etude de suivi du trait de côte et schéma directeur littoral de l'Afrique de l'Ouest, Etude de cas au Sénégal, Évolution du trait de côte du littoral de Palmarin, Rapport d'Etude de cas, 94 p.


Representation of the Village of Diakhanor in the Commune of Palmarin
Commune of Palmarin
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Village of Diakhanor
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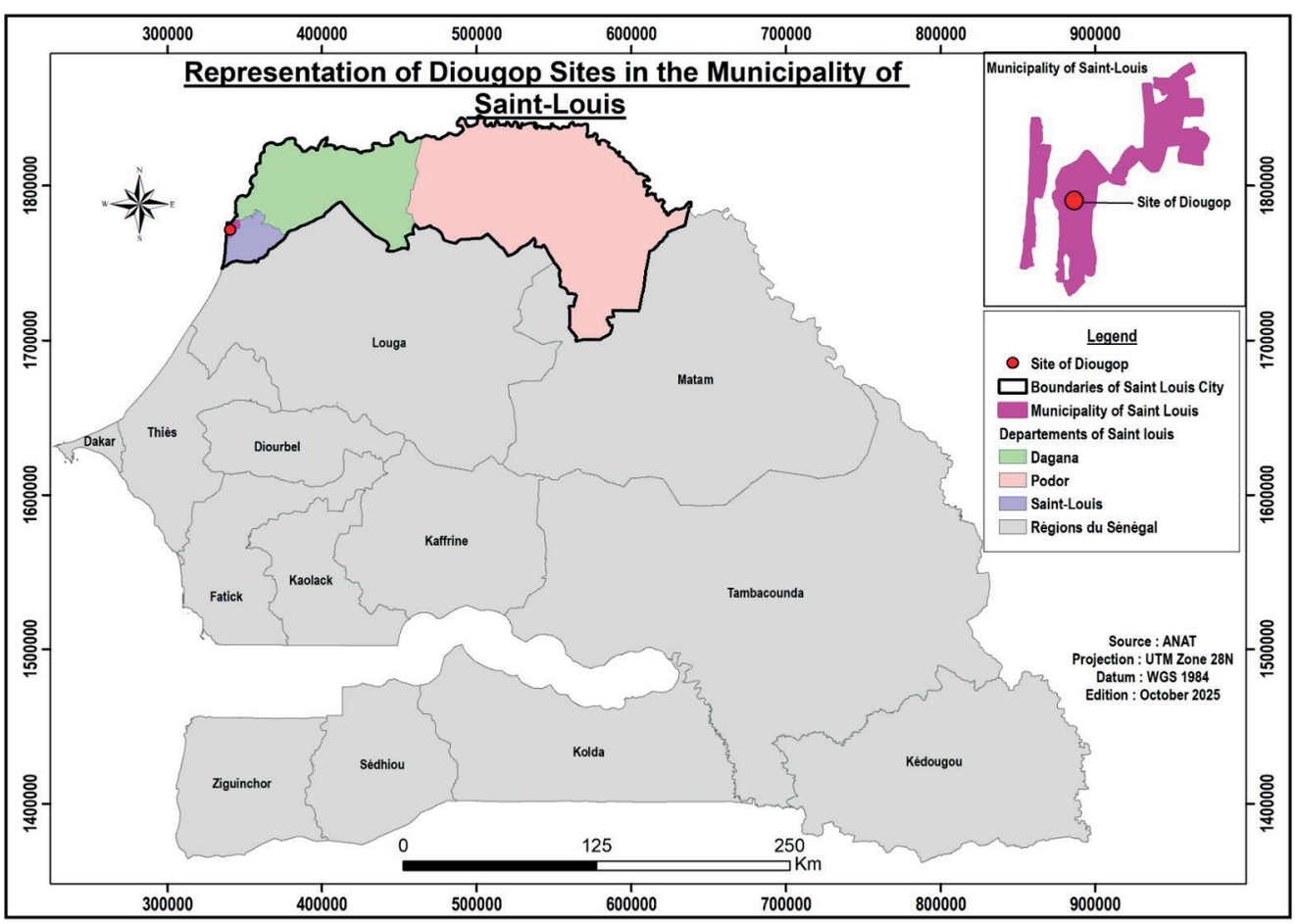
Representation of Diougop Sites in the Municipality of Saint-Louis
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Site of Diougop
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