Assessment
2016

West Africa coastal areas

EXECUTIVE SUMMARY

UEMOA

MISSION D'OBSERVATION DU LITTORAL OUEST AFRICAIN
WEST AFRICAN COAST OBSERVATION MISSION
MOLOA

2017

This document has been developed by the West African Coast Observation Mission with the support of the Centre for Ecological Monitoring (CSE) and the International Union for the Conservation of Nature (IUCN) as part of the implementation of UEMOA Regional Coastal Erosion Control program and the enforcement of article 10 of the Abidjan convention related to coastal erosion control through the implementing agency agreement entered into between UEMOA and CSE in November 2012.

The initial version of the Master plan for the West African coastal area (SDLAO) was published and validated in 2011. The rapid change in the coastal occupation observed in 2011 involved, on the one hand, the establishment of a regional observation mechanism, and, on the other hand, a planned updating of this master plan.

One year after the validation of the SDLAO, the West African Coast Observation Mission (MOLOA) was set up, comprising a regional coordination unit and country branches in each of the 11-member countries of the initiative. The entire monitoring work carried out under this mechanism is presented here through two documents: an updating of the general master plan and an updating of the detailed master plan with an updated mapping of the SDLAO at a scale of 1:500,000.

Initially, the updating of the detailed master plan was not a priori deemed necessary, but the magnitude of changes observed during the work required it to be updated in order to report these phenomena. As part of this updating, the priorities, initially set for coastal protection and coastal risk reduction as well as for monitoring and observation activities, have been largely modified in line with observed developments. This updated assessment, following the COP 21 of the United Nations Framework Convention on Climate, proposes an updating of the SDLAO elements resulting from the work of the network set up under the MOLOA, comprising the country branches of the 11 coastal states, from Mauritania to Benin[1]. This work is, however, proportionate to the resources made available by the West African Economic and Monetary Union (UEMOA). In this context, MOLOA's country branches did not have a specific budget and were therefore required to undertake their activities to the extent of their own resources, while supported for regional meetings by MOLOA coordination.

The preparation of this 2016 assessment of West African coastal areas therefore involved all members of the regional coordination of MOLOA under the initiative of the Centre for Ecological Monitoring of Dakar (CSE), the members of the regional scientific and policy committees of the UEMOA Regional Program for the Fight against Coastal Erosion, supported by the International Union for Conservation of Nature (IUCN), particularly its Coastal Experts Group of the World Commission on Ecosystem Management, the Regional Coastal and Marine Conservation Program for Central and West Africa through its secretariat.

The prospective study conducted in 2010 with the target dates 2030 and 2050 showed the rapid development of human occupancy in most areas of this shoreline. In fact, the heavy trends observed both at the demographic and economic levels now seem to be fully confirmed by the developments noted between 2010 and 2015. The prospects on climate change impacts, updated through the 5th report of the Intergovernmental Panel on Climate Change (IPCC), are also troubling, and some recent events in various parts of the West African shoreline confirm this trend.

Focusing on the main changes in the period 2010-2016, this work is based on advances in knowledge and a regional vision of great changes shaping the future shorelines of West Africa, establishing thus the policy lines for potential relevant adaptation strategies to climate change impacts in the West African context.
It addresses current changing pressures on coastal systems (Chapter 3) and the responses of States and their partners to cope with these pressures (Chapter 4). These elements are preceded by a general context (Chapter 2), which includes an updated review of the forecasts made during the 2010-2011 SDLAO.

SOME NEW ELEMENTS

This updating presents new and complementary elements in relation to the work carried out and validated in 2011:

- The regional system of marine protected areas has been taken into account in a detailed manner through a mapping, enabling thus a fairly comprehensive inventory of existing information. This dimension is important in that it reflects the approach to tightly integrate coastal area development with natural ecosystem conservation efforts and to enhance protected areas as a natural solution for coastal risk mitigation ;

- Urban extensions, and, in general, all the major centers of human settlements have been mapped using high-resolution images, whereas the initial version only focused on significant urban centers ;

1 Mauritania, Senegal, Gambia, Guinea-Bissau, Guinea, Sierra Leone, Liberia, Côte d'Ivoire, Ghana, Togo and Benin.

- Major hard structures for coastal protection development have been identified.
- The changes in main coastal infrastructure have been described.

The detailed 2011 master plan included a set of 179 sectors, each with a more or less homogeneous coastal profile. Despite the importance of the changes observed, it was not deemed necessary to amend this segmentation, except for certain elements of nomenclature[2]. However, the priorities have significantly changed, with 41 out of 179 sectors having as top priority for action coastal protection and coastal risk reduction, and 53 of 179 sectors having as top priority for action monitoring and observation.

REVIEW OF TREND FORECASTS

While overall, initial trend forecasts for the period 2030-2050 are generally confirmed or even exceeded in terms of demographics, as reflected in the development of coastal occupation, trends in economic growth have remained more modest than expected.

The persistent insecurity in the subregion's continental areas, the moderate confidence of investors, and a certain decline of commodity pressures due to slower growth in emerging markets, resulted in a fairly more moderate economic growth than initially expected (4.2% in 2015). In 2016, this growth would be consolidated at 5.2%.

The Ebola virus had a crippling effect on the economies of the three main affected countries in West Africa (Guinea, Liberia and Sierra Leone), while the three affected countries experienced impressive growth rates during the first half of 2014. The economic impact of the virus on other countries in West Africa has been very limited.

2 Primarily the zoning of Benin which is adapted to the widely used zoning in the country

SHORELINE MOBILITY : SOME HOT SPOTS OF THE WEST AFRICAN COASTAL AREA

In terms of shoreline mobility, the conditions already known in 2011 have generally been confirmed, and even worsened, particularly in areas where coastal protection structures were constructed, with results to be confirmed and assessed in the future. The main risk situations may be summarized as follows:

- The erosion resulting from port infrastructure remains particularly significant in some cases, notably in Nouakchott, Abidjan, Lome or Cotonou.
- The erosion resulting from sediment trapping by dams: this situation concerns the entire coastal zone in the east of the Volta delta, but also the functioning of the Mono-Couffo estuarine system in Benin.
- The erosion resulting from the building of residential constructions in tourist sectors, particularly affecting the Petite Côte in Senegal, the Gambia and periodically other sectors in Côte d'Ivoire, Ghana and Benin.
- The alteration of rice growing areas in Guinea and Guinea-Bissau, was particularly pronounced, leading to the destruction of large production areas.
- The progression of salt waters currently threatens the productivity of traditional market gardening areas such as the Gandiolais in Senegal or the sector of Keta in Ghana.

Some sites identified as particularly sensitive have experienced significant mobility of the shoreline, leading to the destruction of infrastructure and buildings, including heritage sites, such as in Grand Lahou, Côte d'Ivoire.

SOME HIGHLIGHTS

Major ports and containerization, mining ports and landing points

All ports on the West African Atlantic coast are now experiencing major developments: new docks, container parks (a doubling of containerized volumes planned by

2020), dredging operations, etc. These developments have practically no exceptions and are generally in line with the dynamic of economic catch-up which is characteristic of a sub-Saharan Africa that has remained little integrated within the international logistical movements.

However, two elements must be noted:

- The port concentration strategy remains limited, as port performance is now strongly linked to strategic transshipment capacities, including multimodal transport and connection to roads. The West African network does not yet meet the criteria to contribute to the emergence of truly dominant hubs, although important projects are now under discussion at the regional level The political insecurity that still persists in West Africa also contributes to slowing down the search for complementarity or improved efficiency between the various port infrastructure.

- The increasing number of port concessions involves enhanced State responsibilities in the management of environmental externalities of these port complexes (particularly as regards the modification of hydro-sedimentary flows), amid increased competition between private concession-holder operators.

The mining port infrastructure is rapidly expanding, even though it is generally integrated with existing ports.

The dispersion of fishing landing points is increasing, with the identification of over 400 points of different sizes. These landing points, when located in mangroves, result in significant environmental impacts particularly due to the use of mangrove wood for fish smoking. Cases of organic pollution are identified in the vicinity of residential areas, particularly in Senegal.

Emergence of the NAtural-TECHnological Risk (NATECH): the need for processing of mining products, and the intensification of hydrocarbon exploitation, with the multiplication of associated offshore and onshore infrastructure, also lead to the emergence of natural and technological risk in fragile coastal areas that are subject to various types of hazards.

Infrastructure and equipment of the coastal area

The population and urban growths, amid a relatively high economic growth, lead to a rapid development of cross-border transportation and integration infrastructures.

The most significant and structuring feature at the regional level is the Abidjan-Lagos corridor, about 1 000 km long. It is one of West Africa's major economic routes connecting capital cities such as Abidjan, Accra, Lomé, Cotonou to the major economic center of Lagos in Nigeria. About 50 million people transit through this route which serves a resident population of about 30 million people. It will progressively take the form of a long conurbation along the Gulf of Guinea, across two important sediment basins, ecological systems as well as particularly fragile wetlands. This corridor is being consolidated with the construction of new road sections in Côte d'Ivoire, Togo, Benin and Ghana.

Highway connection between coastal peri-urban extensions: The most important one is the Dakar-Thiès-Mbour highway in Senegal. Such connections also exist in Côte d'Ivoire and Guinea.

Peri-Urban extensions

The comparison with the 2011 SDLAO suggests significant changes:

- **Increasing progression of peri-urban extensions:** it is interesting to note that these extensions are mostly made landward of agglomerations and not seaward, as those areas are generally already saturated for a long time.

- **Progression in some situations of axial residential extensions** along direct coastal roads located at the entrances or exits of major cities on the coastal road corridors.

- **Sometimes rapid development of some urban centers and secondary cities** distant from the coast and likely to polarize future developments away from the coast.

- In some very localized areas, **coastal area occupation dynamics is rapid and important**.

STATES' RESPONSES TO COASTAL RISKS

Beyond the temporary protective coastal constructions, States have taken various measures that can be broadly divided into three categories:

- **Inclusive approaches based on framework documents and a territorial approach to coastal development**: These approaches combine both framework legislative instruments and master plans. It is mainly the Case in Mauritania with the coastal management master plan, in Senegal with the Dakar-Thiès-Mbour master plan and in Côte d'Ivoire with the Grand Abidjan urban master plan as well as the proposed master plan for coastline protection and development.

- Countries with emerging territorial approaches: In Ghana, the establishment of a Green Infrastructure Network (GIN) including protected areas, green buffer zones along the coasts, main rivers, valley rivers and lakes can lay the foundations for a territorial management of coastal areas and coastal hazards. In Togo, studies were launched in 2014 for the establishment of a master plan for the development and urbanization of the Grand Lomé area. In Benin, a draft coastline law could be adopted during 2007. The country has also taken important steps in defining institutional responsibilities for coastal management, through the establishment of a coastline police.

- **Countries with an institutional approach to coastal management:** With the exception of Gambia, these countries face low coastal risks, in a context where the development of coastal stakes has also remained modest. Therefore, the need to supervise these developments is not yet a top priority, and legislative and legal actions are usually sector-centered. In these countries, the extremely rapid development of some infrastructure, especially port installations, like in Guinea, in a poorly supervised territorial environment, can lead to a rapid increase of risks.

Coastal protection developments

Coastal States are carrying out developments which are often aimed at relieving risk situations that are already firmly entrenched. Except for some specific examples, such as the Keta or Banjul areas respectively in Ghana and the Gambia, few of these developments have been designed in a systemic manner. Most of the time, such developments are focused on the temporary management of sectors experiencing a rapid erosion. The major protective developments are obviously concentrated in strategic areas, or in areas with low stakes but where the risk of shoreline retreat is particularly high.

These include:

- The Nouakchott coastline in Mauritania;
- In Senegal, an important part of the Cap-Vert peninsula (region of Dakar) along the corniche, in the Bay of Hann and the entire Petite Côte. There are obviously other developed areas, but they host fewer constructions;
- In the Gambia, the whole Northern and North-Western coastline of Banjul, where overarching actions have been taken, including beach nourishment and curved spurs construction activities;
- In Ghana, the entire system covering the area from the Volta to the Keta site that hosts very important developments;
- In Côte d'Ivoire, the Abidjan coastline west of the Vridi Canal;
- In Togo, the entire coastline East of the Port of Lomé and especially in the border area with Benin (Aneho);
- In Benin, the entire coastline East of the port.

Given the experiences in different parts of the world and their often counter-productive results, it is relevant to include in the coastlines' routine monitoring a follow-up of the coastal development effects, so as to better understand the reason behind the failure and the few progress that have been experienced.

Like those practices becoming more and more common in developed countries, the use of soft coastal protection solutions or the combination of conventional engineering solutions and green solutions will contribute to improving both the efficiency of these responses but also their

sustainability on the short and long terms as well as the cost-benefit relationship characterizing them.

The regional system of marine protected areas aimed at promoting the resilience of coastal systems

The regional system of marine protected areas in the 11 countries currently includes 91 conservation units with varying maturity levels, some of these units being old and well structured whereas other have only recently been created. It is therefore a relatively heterogeneous conservation system that also includes a relatively important number of wetlands of international importance - Ramsar site with more or less unspecified management techniques.

At the regional level, this system does not provide yet a coherent enough structure capable of significantly contributing to the preservation of the ecological services needed by coastal societies and necessary for the reduction of coastal hazards. Whereas this network of protected areas is characterized by a relatively balanced integration of different types of coastal ecosystems, there are still wide areas without any protective measure.

The activities of the Network of Marine Protected Areas in West Africa (RAMPAO), the first results of the transatlantic partnership that is being launched on the marine protected areas and the resilience of coastal areas are likely to provide some clues that should be taken into account in the future developments of this conservation system, so as to more optimally contribute to the resilience of coastal areas.

TOWARDS A DOCTRINE ON THE ADAPTATION TO CLIMATE CHANGE IN WEST AFRICA'S COASTAL AREAS

The main document of the West Africa's 2011 coastal master plan provides many general and founding elements for the development of an approach on the reduction of coastal hazards and the adaptation to climate change in coastal areas. These recommendations are still relevant today, and their consideration at all levels would really allow for increased resilience in West-African's coastal societies.

Adaptation strategies should combine differentiated approaches, clearly coordinated:

Territorial approach of adaptation: It aims at taking action on shoreline lands development and organization, in order to promote their resilience and reduce the exposure to hazards of the most sensitive key stakes. This territorial adaptation approach should also involve measures aimed at preserving natural ecosystems or their rehabilitation (hydrographic network, depolderization, etc.). The inclusion of the overall space and time is significant here, knowing also that territorial approach of adaptation is usefully supplemented by sector-based approaches. A territorial master plan stating a short to medium-term vision and proposing an identification of stakes in the most sensitive areas will be completed in its implementation by the building of infrastructure complying with standards relevant to climate change specificities, while the organization of individual, industrial, or private constructions will also comply with innovative schemes and be adapted to risk reduction. Considering the rapid urban growth in West Africa, it is first at cities and suburban levels that a territorial approach of adaptation is better justified, today. The recent experience of disasters having hit major urban entities has shown the need to review deeply urban principles. It is particularly the respect or rehabilitation of natural systems, as integral parts of urban areas (blue and green belts for instance), which can notably increase the future city resilience and adaptation in coastal areas. In that way, the links to be developed between conservation approach and territorial approach of adaptation are also obvious.

Sector-based approach of adaptation: It intends to develop, in sectors directly confronted with coastal risks, adapted standards and practices: port infrastructure, roadways, urban planning, tourist implantations, fishing, agriculture, mining activities, etc. Like for the territorial approach to adaptation, the building of sector-based scenarios, then their conjunction, may contribute to bringing to light potential synergies between adaptation measures.

Shaping governance to coast areas specificities: Just as the effects of climate change are not partitioned, and that we generally have multi-purpose coastal areas, governance should aim at promoting dialogue and empowering different categories of stakeholders. The need to adjust adaptation approaches regularly and scenarios depending on the evolution in knowledge requires the implementation of fast and transparent decision-making mechanisms. It is also about the legislative governance, as testified by the different projects developed by the States of the region, especially in terms of coastline Act, but also on the exec-

utive level by regulatory measures, such as the prohibition of dune sands collecting, for instance. In a context of uncertainty which characterizes the making of decisions related to climate change adaptation, it is also important to be equipped with tools facilitating arbitrations, especially at local and communities level, where decisions may more easily and concretely be documented.

Development of knowledge for adaptation : Climate change effect assessment remains largely marked by uncertainty regarding its appearance, but also concerning the relevance of proposed responses, as long as we do not have enough time and experience to assess the effectiveness and viability of those responses. Technical and scientific knowledge mobilization and their translation and dissemination into concrete and operational terms underlie the whole adaptation approach. MOLOA which was established 3 years ago is part of this system. Its first three years of functioning have enabled to bring to light different constraints, the main of which is structural and institutional. The stakeholders a priori directly concerned by shoreline observation and coastline monitoring, in general are university researchers, while the observation mission is under the authority of the Ministry of Environment in concerned countries. On the other hand, structuring decisions related to land development are also shaped by other departments. The structuring of coastline observation and management at national level, enabling to implement multi-sectoral platforms of stakeholders represents a solution to improve this dialogue. A second challenge is didactical, concerning the provision of information and accessible as well as usable messages by decision makers, while the economic valuation of shoreline mobility impacts or responses in terms of land development or simply natural shoreline infrastructure defense remains difficult.

CONCLUSION

States responses to coastline risk intensification and generalization changed during the period 2010-2016. Some sensible planning initiatives undertaken are an encouraging evidence of that. However, the coastline risk evolution, particularly linked to the concentration of human and economic stakes near the shoreline, is continuing at an extremely rapid pace, still largely separated from States responses evolution.

In terms of coastline risks, we are facing today the consequences of decisions sometimes made more than 20 years ago, and the current decisions influence directly the future profiles in coastline areas destined to a fast densification. A key conservation measure, today, resides in the implementation of significant land reserves already covering strategically sensitive areas which have not yet been occupied, converted or urbanized. These provisions should enable the preservation of ecological services, while the structuring land development schemes will direct human occupation evolution towards the hinterland.

Addressing coastline risks at local level should involve more directly local officials and professional corporations which are directly facing it, with the relevant support of competent technical services. The strengthening and development of cooperative initiatives with Northern countries which have long been confronted with land pressure challenge and land development in coastal areas should be taken into account to avoid repeating the same mistakes in the past.

The last initiatives for example the West African Coastal Areas program (WACA) of the World Bank show that SDLAO represents a strong foundation, from which these new initiatives have emerged. This instrument should be considered as dynamic, and efforts must be maintained for a continuous improvement of its updating and dissemination modalities among the coastal decision-makers and stakeholders of the States of the region.

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