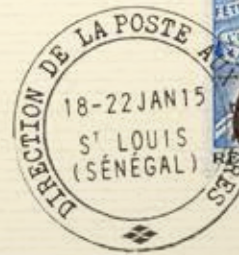




INITIATIVES POUR L'AVENIR  
DES GRANDS FLEUVES  
INITIATIVES FOR THE FUTURE  
OF GREAT RIVERS



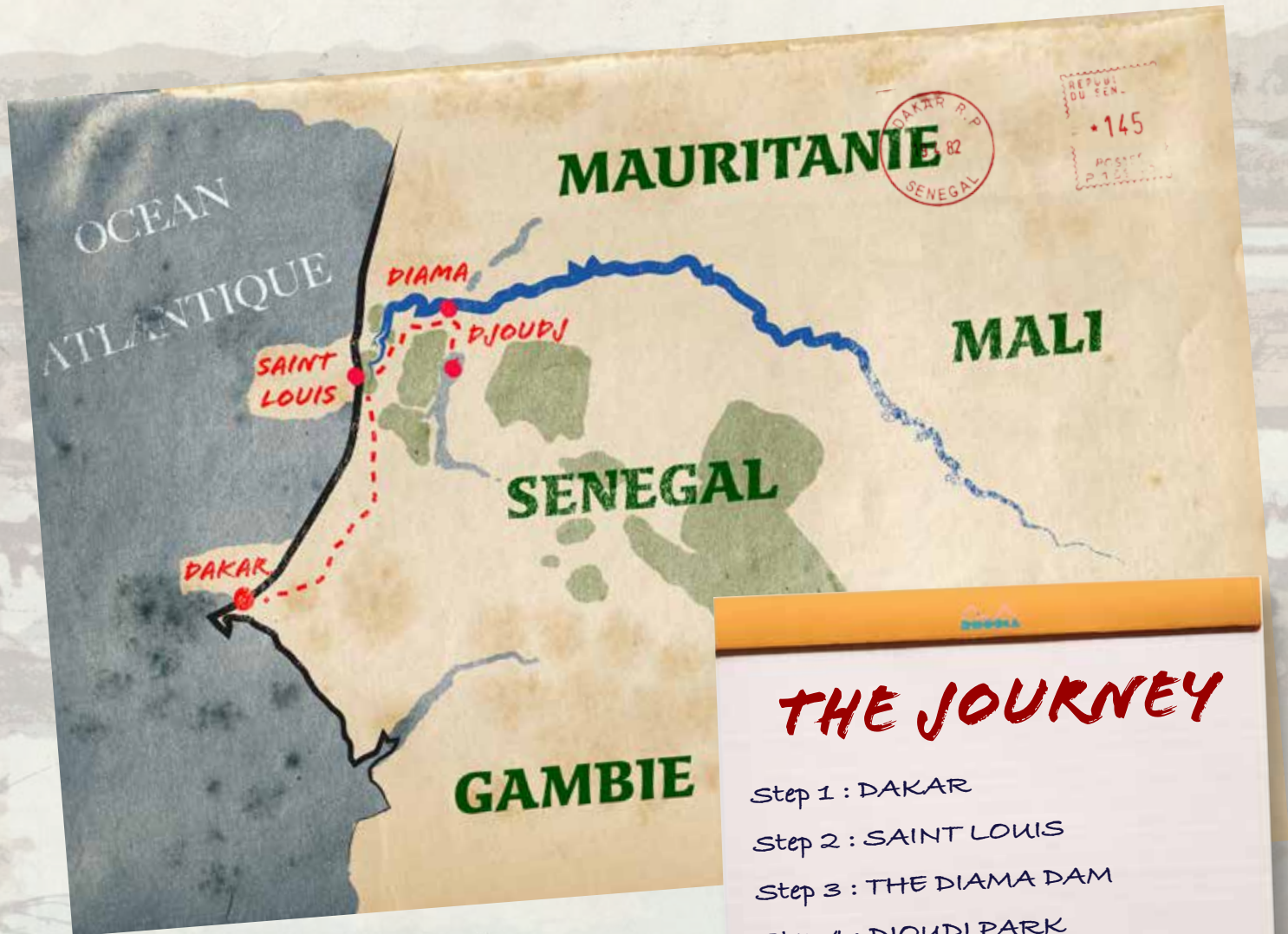
# THE SENEGAL RIVER







From the furthest reaches of history, explorers have cherished the Senegal River. It provided them with the most convenient route for discovering the heart of West Africa. As far back as fifth century BC, Hannon the navigator set up small trading posts along it to initiate trade with his powerful city of Carthage. The Senegal River was mistaken for a branch of the Nile and its crocodiles and terrible hippopotamuses in particular gave reason to shudder. Much later, in the mid-19th century, it became a corridor for French colonisers who left the many forts that still stand on its banks.



The roadmap

## THE JOURNEY

- Step 1 : DAKAR
- Step 2 : SAINT LOUIS
- Step 3 : THE DIAMA DAM
- Step 4 : DJOUDJ PARK

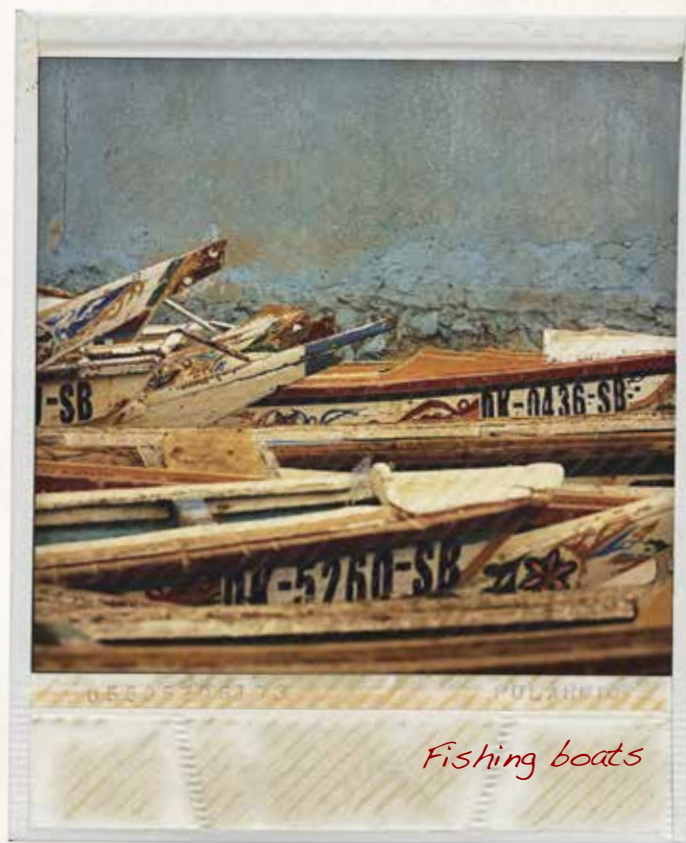


This river is formed by smaller rivers that come from the small mountain range of Fouta Djallon, which is also where the source of the River Niger is located on the Mandingue plateau. From upstream to downstream the rivers are the Bafing (50% of flow rate), the Bakoye (25%) and the Falémé (25%).

The River Senegal is 1,830 kilometres long and drains a catchment area of 289,000 square kilometres. The upper section of the river separates Mali from Senegal after which, before flowing into the Atlantic Ocean south of St Louis after a long meander, it forms the border between Senegal and Mauritania.

One of the river's particularities is that its flowrate is very variable. There is a considerable seasonal difference: 100 cubic meters per second from January to June; and more than 5,000 cubic metres per second during the winter period from July to September. The floods are often fatal, as in 1906 and 1950, and the droughts can be catastrophic, as in that of 1972 - 1973 which decimated herds. Annual differences are also significant: from 6 to 40

billion cubic meters. On 11 March 1972, three of the countries concerned, Senegal, Mali and Mauritania, founded the Organisation for the Exploitation of the River Senegal (OMVS). It was joined by Guinea, the "water tower" of the region, in 2006.



*Fishing boats*



# Dakar

This new organisation was entrusted with five missions, each as ambitious as the other:

- regulating the river's flowrate to avoid floods and excessively low flows;

- producing electricity. This will be the objective of the Manantali dam, in Malian territory on the upstream section of the River Senegal;

- stopping the influx of salt upstream from the sea. Another dam will be built for this purpose at Diama, close to the estuary;

- cultivating new land through the massive development of irrigation;

Ending the isolation of certain regions, especially in Mali, through the development of navigation. A sixth mission was not set out since it was obvious: that of drawing the countries crossed by the river closer together.



*Meeting in Dakar*



In forty years, the OMVS has provided an indispensable framework for cooperation that calms sometimes violent conflicts of proximity. Thus, in 1989, following a dispute between Mauritanian livestock breeders and Senegalese farmers, clashes degenerated, causing dozens of deaths and leading to massive transfers of populations. The OMVS has played a role in restoring calm. The organisation has adhered to two main principles since it was founded.

Firstly, the river and its tributaries are international property (Charter of Senegal of 1972). Secondly, the common structures are managed collectively with financial participation corresponding to the use made of them by each participant. To date, the OMVS has remained the only

river basin organisation to have presented this type of inter-governmental cooperation. Although imperfect, for some this cooperation appears to be a realistic path towards

African unification. Far from the solemn declarations made by the Organisation for African Unity (OAU), often without sequels, the OMVS progresses because it is subject to obligations of performance and sharing. Water is a good over which no government can claim ownership. Was this not the case of Europe whose

construction began by pooling coal and steel?

Other networks of concrete solidarity are beginning to emerge in this sector, notably the African Network of Basin Organisations.



*Meeting in Dakar*



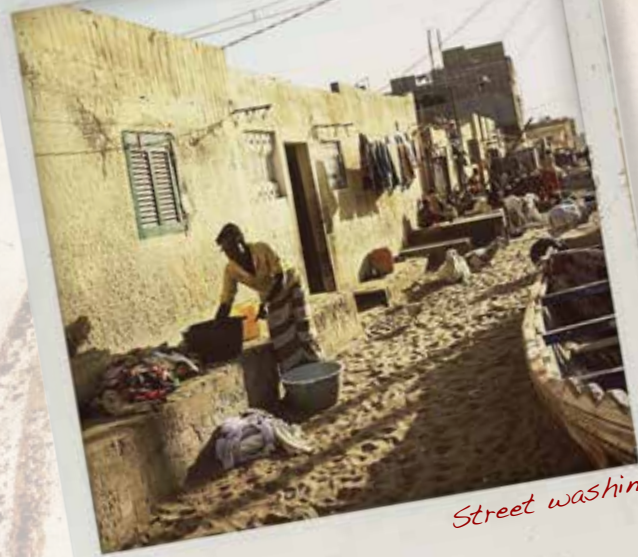
That being said, the OMVS has only fulfilled (a small) part of its fivefold mission.

The first objective is on the right track : the course of the river has almost been regulated. Major floods are now only a bad memory, as are the low and almost no flow levels that regularly deprived the river of water. However, the Manantali dam cannot do everything. Located upstream on the Bafing, it only controls half the flows. The rivers Bakoyé and Falémé, which join the River Senegal downstream and represent the other half of the discharge, continue to flow freely with very irregular flowrates. The system should be completed by projects for additional structures. But since human beings are never happy,

they now regret the good side of the floods: subsidence! The silt deposited on the land by the floods allowed them to produce crops with high yields. What would Egypt be without the gift left by subsiding floods?



**OMVS**  
ORGANISATION POUR  
LA MISE EN VALEUR  
DU FLEUVE SÉNÉGAL



*Street washing*



*Fishermen in the bay*



*The Dakar bay*



*Local fishmongers*





As for energy, the result is less satisfactory. Manantali dam certainly generates electricity that is shared between the three shareholding countries, in conformity with the distribution formula decided in 1972:

52% for Mali, 13% for Mauritania and 33 for Senegal. With an installed capacity of 200MW, it provides 800 GWh annually for the three countries, whereas Senegal alone consumes 3,000 GWh.

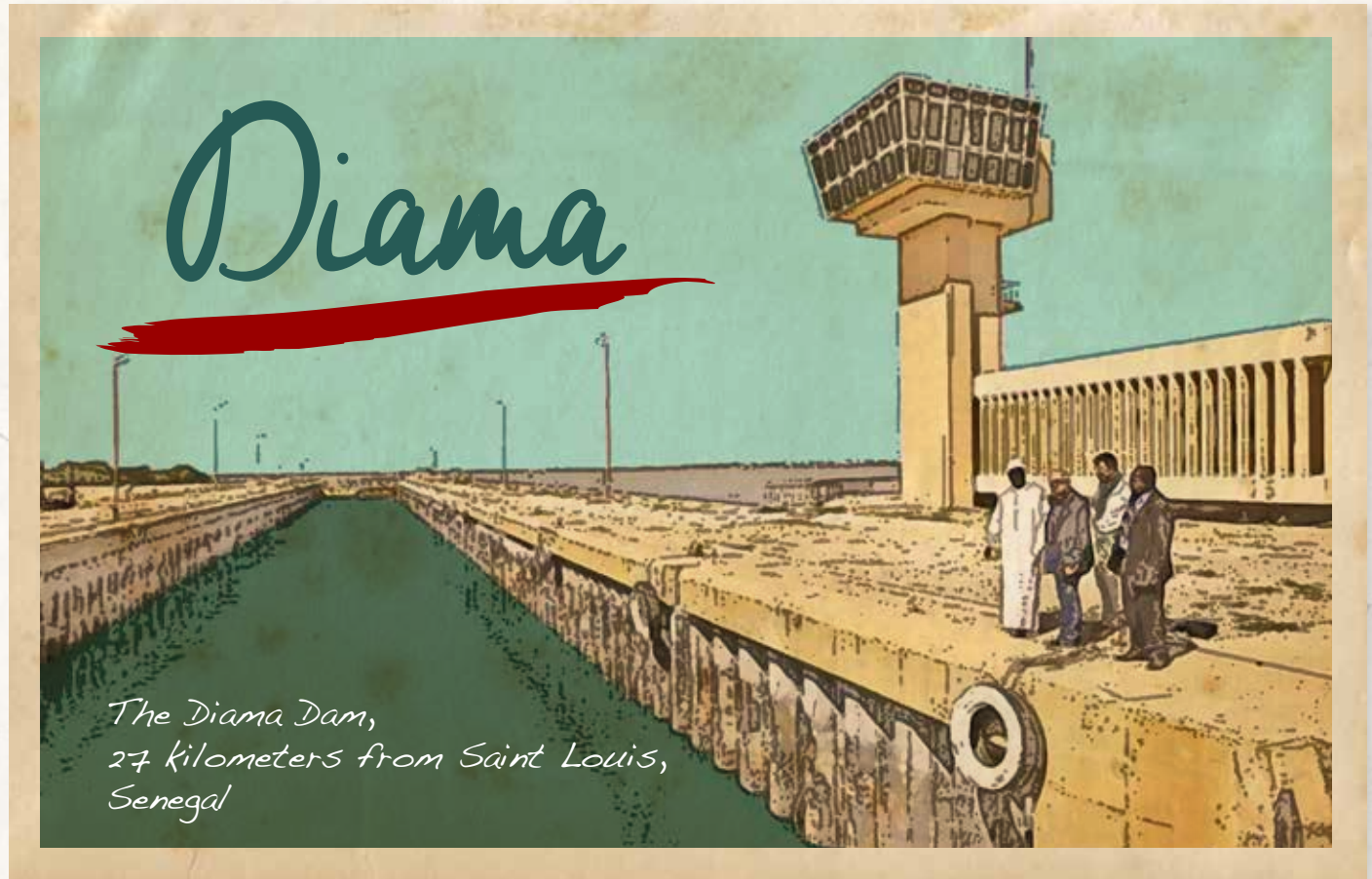
Nonetheless, the quantity delivered is far lower than forecasted. New dams must be built. The first is already in operation at Felou, just upstream of Kayes (Mali). Works on a second are due to start (the Gouina falls). Others, all in Guinée, are on the drawing board. However, the funds necessary have not been brought together, and in any case, the combined capacity will at best supply only a few dozen additional MW. Therefore hydraulic sources in Senegal will never represent more than 10% of the energy consumed. Nothing of significance is planned for solar energy or for wind power, despite Senegal being the child of the sun and the wind.

This country is still one of the poorest of the planet and must opt for the fastest and cheapest solution possible; thus it prefers coal. Coal fired power plants will soon be built within the immediate proximity of Dakar. It is easy to imagine the pollution and the toing and froing of trucks encumbering an already congested peninsular.



*St. Louis' goats*





Diama dam has successfully fulfilled its mission, which was to cut off the influx of sea salt. It must be borne in mind that before this rampart was built, the tide could rise up to Podor, 220 kilometres upstream. As long as the rains failed to fill the river with enough water, that is

to say for nine to ten months a year, the flow rate was not strong enough to resist the sea, so its waters became salty. Still worse, it infiltrated into the groundwater. Consequently, it was only possible to cultivate for two to three months of the year. Above all, there was a shortage of drinking

water. Not only has Diama dam stopped the influx of salt, it has also considerably extended the growing season. In parallel, it serves as a reservoir (100% of Nouakchott's drinking water comes from Diama and 60% of Dakar's drinking water is supplied by the filling of Guïers lake).

However, all dams disrupt ecosystems. Before it was built, a huge and slow pulse animated the valley: salt and freshwater advanced and retreated following an immemorial rhythm. This dance has ended. Nowadays, downstream, the estuary suffers: freshwater no longer flows past and the former ecological balances have been deregulated. The waters upstream of the dam stagnate and eutrophication is winning ground, with species harmful for development. The surface is covered by the plant called



*Visiting the lock*



*Erik & Tamsir Ndiaye from SOGED*



"water lettuce", and by salvinia, but an ally has been found to combat these intruders, a voracious species of fly. But nothing has yet been found to counter the nefarious water hyacinth and the invasive reed (typha), which also provides a breeding place for mosquitoes. The only solution is mechanical, meaning cutting and ripping, when chemical herbicides cannot be used. To darken the picture still further, malaria has set in, as has bilharziasis, due to the multiplication of the molluscs



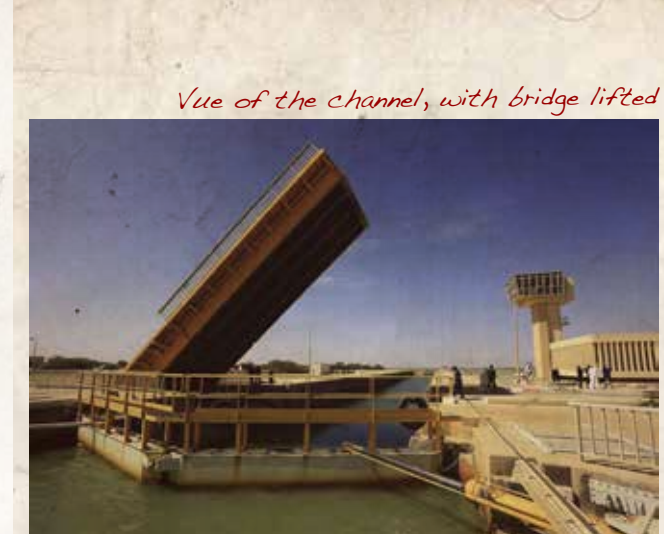
that feed the parasite responsible for the disease. The last and by no means least curse are the birds ! They love these still waters where they prosper thanks to their favourite foods : seeds, fruits and grain. One can understand why the farmers do not consider them warmly. Another element that must be added to the complexity of the situation is the slyness of salinity ! Since the construction of Diama, it is the soil that has become salty. Before, the floods leached it away, now the salt present in the depths stays on the surface.

Does all this mean that the decision to build Diama would not have been taken today? No expert defends this opinion. Without Diama, the valley would be emptied of all its farmers unable to produce anything due to the salt, with the result that immigration to the towns would have increased proportionally. Thus the nuisances have to be taken into account as soon and as rationally as possible. This is the courageous viewpoint held with obstination and force by Mr Tamsir Ndiaye, the general manager of the organisation, Soged, which manages Diama dam.

This engineer has always been concerned by the impacts of the facilities he manages. To this end, since his noted stay at the OMVS, he has published a yearly report on the state of the environment, constantly enriched with the observations made by the peasants. It is he who showed photos establishing, without the slightest possible doubt, the "rotten" condition of his dear Diama dam. «Just imagine, no funds for maintenance were planned. I was able to get them voted only last year! I went to Washington and told the World Bank that there was no point in spending so much on our agriculture. If my dam collapses, our agriculture will die. Sometimes, the bank is intelligent. It granted me a credit for the most urgent repairs». Our meeting with the High Commissioner of the OMVS confirmed this.

For the moment, the navigation file has not really been opened. The splendid lock built to "international standards" lets pass one ship a fortnight at best.

Apart from the dugouts of the fishermen (increasingly impeded by the water hyacinths),



*Vue of the channel, with bridge lifted*



*Archives : The Bou El Mogdad ship passing the dam*

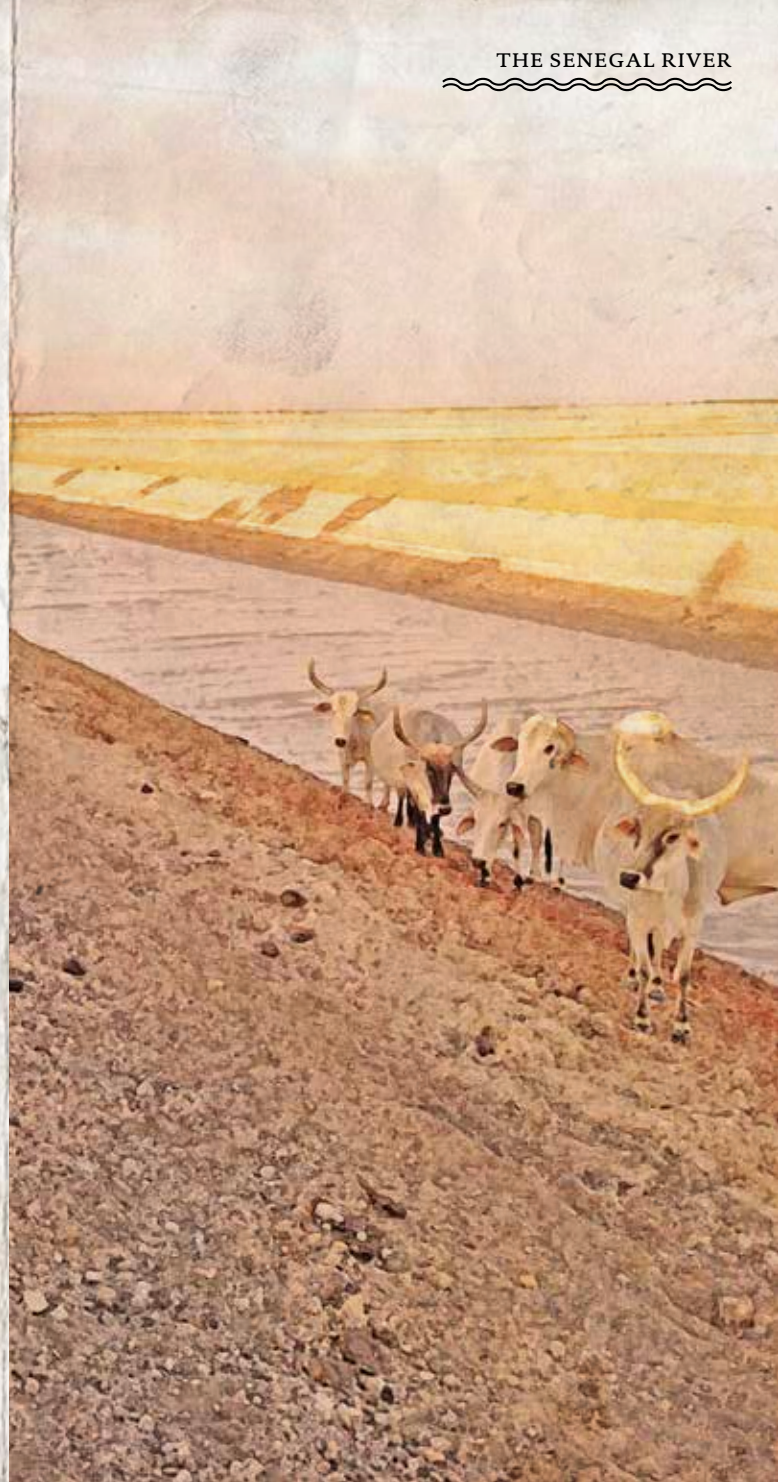
the river is empty. A heart-breaking emptiness ! There is no commercial or tourist traffic. Alone and valiantly, the legendary cargo boat Bou El Mogdad, which has been transformed into a small and comfortable cruiser, offers a few privileged persons the opportunity of discovering



the world of Toucouleurs. But as early as 1908, a set of nautical instructions guided the captains of St Louis to Kayes, meander after meander, rock after rock, with beacons in support ... Kabiné Komara, the former Prime Minister of Guinea and currently High Commissioner of the OMVS, assured us that navigation will start again. «We're going to wake up the port of St Louis, build 9 stopovers, open a new lock at Diama, and dredge the river bed. So, soon you will soon see plenty of boats sailing from the sea up to Ambidedi, just downstream of Kayes». He thinks he can attract investors with the recent discovery of mining resources: iron in Mali, phosphates between Senegal and Mauritania, close to Matam. The river is the only route for transporting the items required to build the facilities. And the river is the only means of removing the products from the mines.

Now we arrive at the main gift the river can provide: irrigation.

*Buffalos drinking  
in the canal banks*





The plan set out to irrigate 375,000 hectares, although the figure of 100,000 has certainly not been reached. Why has this delay occurred when the need for new land is increasingly pressing? It should be recalled that the population doubles every twenty five years and that with 600,000 tons of rice purchased every year (for a production of 300,000), Senegal is one of the six largest importers in the world of this vital cereal for local consumption.

*Farmer  
in its plantations*



There are many reasons for this failure, one of the main ones being the customary status of land ownership. There is no land register. It is the head of the village who, according to reasons as obscure as immemorial, acknowledges the right of such and such an individual to farm such and such a plot. Contrary to intuition, few activities are as gluttonous for capital as agriculture. Therefore, imagine a potential investor fighting to acquire, plot by plot, enough land to generate a profitable concern. And, after great effort lasting several years, who can ensure them that one fine day the ownership of this land will not be disputed? Land reform is in deadlock. In Dakar, the interests of too many large "users" (rather than landowners in our meaning) are at stake.

More generally, the OMVS has sinned by taking an over-technocratic and urban approach. Didn't the villagers of the valley have to wait for thirty years to be supplied with a little of this electricity they saw pass over their heads without having access to it?



However, a new driving force can be seen in these immense territories. Leave St Louis by the road that leads to Richard Toll (Toll means «garden» in Wolof). Just after the university Gaston Berger (whose name was chosen in homage to a mulatto, a great philosopher, and the father of the dancer Maurice Béjart), turn right to Diama. You will see excavators and bulldozers in action everywhere. They are digging canals, building bridges, flattening tracks. Large panels explain that the "Challenge of the Millennium" will be won. And you keep in mind the fine name that the Minister repeated to you the evening before.

- *Our programme, it's the PAPSA!*
- *Excuse me?*
- *The Programme to Accelerate the Pace of Senegalese Agriculture.*

Such is the spectacle offered this morning: the acceleration of a pace! A major element of the Emergent Senegal Plan (ESP) aimed at a growth rate of 7% a year according to the targets set by Mr Sall, the President of Senegal. Senegalese agriculture appears to have finally risen from its slumber.

All these activities cost money and finance is increasingly difficult to find, even if the Chinese banks now lend their support. Our new friend, the manager of the Soged, presents his demand: that of being paid for the water he distributes.

«The users agree on the principle of paying and on our prices that they deem fair. Whether only small village or industrial farmers, they know that they can't do anything without our installations. But how can we recover the money they are ready to pay us and that will be increasingly necessary? I have no sales network, no office or even a bank account for that. Another era has started. Profitability, competitiveness ... Help me to enter it! »





# Djoudj

On leaving, this nature lover advised us to see the birds in their home of Djoudj. Advice quickly followed.



*View of the park*





This ornithological reserve, listed as a UNESCO world heritage site, is the third largest in the world for the number (3 million) and diversity (366 species) of the birds it shelters.

I never miss going to hail my winged friends, my masters of nomadism. They spend their winters here, and in April, when the north gets warmer, they leave to join it. I hope you will see the pelicans fish one day. Their friends the cormorants precede them. They dive to drive the fish out from their preferred depths. Then it is up to the pelicans to play. They plunge their heads under the surface with great flair. All that can be seen are their white, wiggling behinds. Perhaps you would rather see a python sleeping, a white headed fish eagle glide, a baby crocodile struggling between two monitor lizards?

This treasure is also a gift from the River Senegal. A little water is borrowed from it to flood 16,000 hectares: hence the fish, hence the birds. And care is taken to vary the levels. Some species prefer high water levels while others hate losing foot. There is no discussion as to the tastes, the colours and lengths of legs.

Decidedly, a river is life.

**ERIK ORSENNA**

