

# Senegal River Development Organisation (OMVS)

*A Case of sub-regional cooperation (Mali-Mauritania-Senegal) around a river basin*



## I – General context

The Senegal River basin is located in West Africa. It is drained by the 1,800-km-long Senegal River, the second longest river of West Africa, and its main tributaries, the Bafing, Bakoye and Faleme rivers, all three of which have their source in the Fouta Djallon Mountains (Republic of Guinea).

Most of the Senegal River basin has a sub-Saharan desert climate, aggravated by more or less long periods of drought during the 1970s. Access to sufficient quantities of good quality water is, therefore, a particularly sensitive issue, and absolutely crucial for the health of the population and its economy.

The Senegal River basin covers a surface area of about 300,000 km<sup>2</sup>.

The Senegal River basin has a total population of around 3,500,000 inhabitants, 85 % of whom live near the river. This figure includes approximately 16 % of the total populations of the three OMVS (Organisation for the Development of the Senegal River) member states –Mali, Mauritania and Senegal– and the population of the Guinean portion of the Upper Basin.

The enormous socio-economic potential of the Senegal river basin was identified long ago by colonialists and some resources were already being developed long before the countries gained their independence in the 1960s.

		Mali	Mauritania	Senegal
<b>Population</b> (millions inhabitants)	National	11	3	10
	Basin	3.5		
Annual growth rate %	National	2.97	2.9	2.8
	Basin	3		
Urbanisation rate %	National	41	53	51
Farmland (ha)	Basin	823 000		
Irrigated land (ha)	National	78 630	49 200	71 400
	Basin	4 000	44 449	67 830
Livestock (x1000 units) Cattle	National	6 427	1 394	2 927
	Basin	2 700		
Livestock (x1000 units) Sheep & Goats	National	15 986	10 850	8 330
	Basin	4 500		
Landed fish (t/year)	National	100 000	620 000	395 000
	Basin	26 000 to 47 000		

Sources: Observatory for Environment, OMVS

**N.B.** Population figures have been updated, based on growth rates in each country

**Table 3. Water Use (in millions m<sup>3</sup>) by Sector within the OMVS area of the Senegal River Basin**

Sector	Mali	Mauritania	Senegal	TOTAL
Agriculture	1 319	1 499	1 251	1 751
Domestic Use	27	101	68	196
Industry	14	29	41	84
Total	1 360	1 630	1 360	1 991
Per Capita (m <sup>3</sup> /year)	161	923	201	

Sources: Observatory for Environment, OMVS. - Reference year: 1987 except Mauritania (1985)

## **II. Situation before Dams were filled**

### **1. A difficult context**

Before the dams were filled in the mid eighties, activities of the local inhabitants depended directly on rainfall (rain crops) or on floods (flood recession crops), themselves linked to the amount of rainfall, in particular in the Upper Basin in Guinea (Fouta Djallon Mountains). But the dramatic and continuous drop in rainfall during the 1960s and 1970s finally degraded almost the entire base of natural resources (soil erosion, disappearance of vegetation, drying up of surface water, salinity 200 km upstream from the mouth of the river, drop in the groundwater level, degradation and disappearance of pasture land, etc.). Under these conditions, the local inhabitants could not produce enough to survive and the only alternative was emigration. Each year, a large percentage of the population, in particular young people, leaves the Valley and the Delta for capital cities in the sub-region (Dakar, Nouakchott, Bamako, Abidjan, Libreville, etc.) or Europe (usually France or Italy).

### **2. The filling of the dams**

In response to these difficulties, a dam building project was implemented, in order to partially or totally control river flow and, consequently, enable the development of large areas of land for agriculture to contribute to food security. In addition, the dams built to regulate flow could also be used for hydroelectric power plants, to solve the problem of low supply and high cost of electricity, and to maintain a sufficient flow depth in the river for fluvio-maritime navigation to relieve the isolation of Mali by giving it access to the Atlantic Ocean and lower the cost of transporting heavy goods (making it possible to exploit the basin's mineral resources). It is in this context that the OMVS programme was created.

After the dams were filled (1988-1998), sufficient quantities of water became available year-round, enabling local inhabitants to engage in various highly profitable activities. These new opportunities incited the young men who had left to try their luck elsewhere, without much success, to return home. People from the agro-business world also began coming into the area to invest in or create channels to market or small factories to transform the crops grown in the Valley and Delta.

Preliminary studies showed that the irrigation system would re-establish the basis of profitable production. Flow regularisation would guarantee a minimum discharge to 300 m<sup>3</sup>/s at Bakel (reference station), and the storage capacity of the Manantali and Diama dams and the Guiers and Rkiz lakes could be used to irrigate a surface area of 375,000 ha, 3 times the surface area cultivated before 1986.

Unfortunately, this initial enthusiasm diminished when, between the 6<sup>th</sup> and 10<sup>th</sup> year after the dams were filled, new problems arose, two in particular, the degradation of ecosystems and the proliferation of water-borne diseases that very rapidly reached severe endemic proportions. These problems are described in detail below.

## **III. Financial aspect**

Two types of funding are used to finance the development of the Senegal River basin:

- The operating costs of the various OMVS bodies are covered by the three member states, each of which pays one third of the total in January of every year.
- To finance the jointly owned structures and other development activities, funds are sought in the form of loans extended either to the States or directly to the OMVS. In this case, the member states must guarantee the loans. Each member state ensures the reimbursement of its share of the loans.
- **Apportionment of costs and expenses**

The apportionment of costs and debts is done according to an accepted formula, subject to revision, as stipulated in the conventions. The World Bank and the University of Utah (USA) helped develop the formula after testing several methods of apportionment of costs and expenses. The duration of an OMVS project is 50 years. The underlying principle of cost recovery is that the users pay, but the current situation is also taken into consideration. Taxes paid to the Organisation are used to cover operating expenses.

## **IV – Identifying the main problems**

### **1. Degradation of ecosystems/Health of ecosystems**

The flood plain ecosystems have been most affected by developments. In less than 10 years, the degradation of these environments and the consequences on the health of the local population have been spectacular.

Upstream of Diama, the functioning of regularly flooded wetlands, lakes and ponds, like le Djoudj, Guiers Lake (Senegal) and Diawling Lake (Mauritania), has been seriously disrupted. After 1986, Diama dam blocked seawater intrusion. The water above the dam is now fresh year-round, creating ecological conditions favouring the proliferation of freshwater plants (*Typhas*, *Pistia startioles*, *Salvinia molesta* and various alga species). These are very invasive and eutrophication has begun at some places in the Valley and the Delta. Downstream of the Diama dam, perturbations in the functioning of ecosystems takes the form of an increase in salinity and/or a drying up during part of the year (Ndiael wetlands) due to the reduction of flooding or the destruction of water inflow channels during construction of the development works (dikes, irrigated areas, etc.). Anthropogenic pollution is caused by the discharge of industrial and agricultural chemicals into these environments.

Other problems arise from increased competition for agricultural land and firewood. As marginal land on slopes and river banks is cleared, there is increased erosion. In addition, large areas of the basin have been denuded due to overgrazing. As shown in table 2, a big percentage of the population is pastoral and therefore must compete for land, increasing competition between agriculture and pastoralism.

### **2. Public health**

The degradation of the basin's ecosystems has affected the riverine population to various degrees. For example, there has been a drop in productivity in some economic areas (agriculture, fishing, livestock raising) compared to productivity during the first years after the dams were filled, which has led to a decrease in income and, therefore, a decrease in the standard of living.

The most serious problem that the basin has had to face since 1993-1994, however, is the impact of the dams on public health. There has been not only a rapid increase in the prevalence of water-borne diseases that were already known in the area (malaria, urinary schistosomiasis, diarrhoea, intestinal parasitic diseases, etc.), but also the appearance of intestinal schistosomiasis, a much more dangerous form of the disease.