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MARGARET J. VICK*

The Senegal River Basin: A Retrospective and Prospective Look at the Legal Régime

ABSTRACT

In 1963, the four states along the Senegal River organized for the common development of the basin. In 1972, the states of Mali, Mauritania, and Senegal formed the Organization for the Development of the River Senegal, which has been lauded as the most progressive of river institutions. However, development of the Senegal River resulted in devastation to the health of the riverine population and the ecology of the basin. This article provides a retrospective and prospective look at the river basin institutions, examining the effect of the 2002 Water Charter, which again incorporates the most progressive principles of the law of international watercourses.

[I]mplementing international cooperation in water use, management, and protection is not an easy task. In the most favourable conditions, cooperation is the result of lengthy negotiations and unabated good will.¹

INTRODUCTION

The Senegal River has brought together the riparian states of Mali, Mauritania, Senegal, and Guinea² in a unique cooperative effort to transform the region from developing to developed states. The river, the legal régimes, the responses to problems, and the outlook are extraordinary for the level of cooperation among the states,

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1. Dante A. Caponera, *Patterns of Cooperation in International Water Law: Principles and Institutions*, 25 NAT. RESOURCES J. 563, 569 (1985).

2. Guinea, the uppermost riparian state on the Senegal River, has not, until now, participated in any basin agreements entered into by the other three states since 1972. After this article was submitted, however, it was reported that Guinea signed the Water Charter, see Part III *infra*, which is pending ratification according to the law of Guinea; see email from Stephen McCaffrey, Distinguished Scholar and Professor, University of Pacific McGeorge School of Law, to author (Apr. 26, 2006, 08:27 PT) (on file with author).

incorporating the most progressive principles of the law of non-navigational uses of an international watercourse.

This article describes the Senegal River Basin and the Conventions entered into among the riparian states from independence in the 1960s through the 2002 Water Charter. The first part discusses the problems that beset the river valley following the construction of the Manantali and Diama dams under a legal regime created in 1972 and lauded as developing the most progressive river management institution. The next part looks back at the basin Conventions beginning in 1963, soon after independence, in light of the problems that plagued the Senegal River valley and asks if these problems could have been anticipated or more quickly remedied.

Part 3 looks to the future of the Senegal River Basin, discussing the key provisions of the 2002 Water Charter drafted to address and remedy problems experienced in the Senegal River valley and to prepare the basin states for future development.

In conclusion, the author asserts that the Senegal River Basin benefits both from adherence to specific legal principles and from maintaining and enhancing the institutions that permit the basin states to cooperate for river development.

I. THE SENEGAL RIVER BASIN

The Senegal River rises in the Fouta Djallon Mountains of Guinea and southwestern Mali as three tributaries, the Bafing, the Bakoye, and, farther downstream, the Falémé. The Senegal River's basin covers approximately 483,200 km² in the countries of Guinea, Mali, Mauritania, and Senegal. The river flows through three distinct regions, the mountains of Guinea and southwestern Mali, the valley forming the border between Mauritania and Senegal, and the delta at the Atlantic Ocean.³ The basin is home to an estimated 3.5 million people in the four countries, 85 percent of whom live along the river.⁴

The climate of the basin varies from mountain terrain in Guinea, receiving on average 1,475 mm of precipitation annually, to the more

3. D. Finger & C. Teodoru, Case Study Senegal River, ETH Seminar: Science and Politics of the International Freshwater Management (Nov. 3, 2003), http://www.eawag.ch/research_e/apec/seminars/Case%20studies/2003/Senegal%20River.pdf.

4. U.N. World Water Assessment Programme for Development [UN/WWAP], *1st U.N. World Water Development Report: Water for People, Water for Life*, 450 (U.N. Educational, Scientific & Cultural Organization 2003) (Senegal River Basin, Guinea, Mali, Mauritania, Senegal Case Study, available at http://www.unesco.org/water/wwap/case_studies/senegal_river/senegal_river.pdf) [hereinafter World Water Assessment].

arid valley and delta regions, which receive as little as 270 mm of annual precipitation.⁵

Historically the basin flooded seasonally permitting recession farming within the valley on 15,000 to 150,000 ha depending on the flood flow. The basin suffered devastating floods in 1890, 1906, and 1950.⁶ More problematic for the people and the economies of the region than flooding was the drought during the 1970s,⁷ which caused famine within the region and changed the ecology of the riparian system. The low or nonexistent freshwater flows through the delta resulted in seawater intrusion, which formed a saltwater wedge 200 km upstream.⁸

In response to the droughts and to meet the economic needs of the region, the riparian states of Mali, Mauritania, and Senegal entered into the Convention on the Statute of the River Senegal on March 11, 1972.⁹ Its purposes are to

- Declare the Senegal River an international river;
- Affirm close cooperation in the development of the river resources;
- Guarantee freedom of navigation; and
- Provide for the creation by Convention of an organization of cooperation for all matters related to the development of the river basin.¹⁰

The parties signed the Convention Creating the Organization for the Development of the River Senegal the same day.¹¹ The purposes of this Convention are to:

5. Finger & Teodoru, *supra* note 3, at 4.
6. *Id.*; SCIENTIFIC DATA FOR DECISION MAKING TOWARD SUSTAINABLE DEVELOPMENT, SENEGAL RIVER BASIN CASE STUDY, SUMMARY OF WORKSHOP 4 (National Academy of Sciences 2003), available at <http://fermat.nap.edu/html/srb11/index.html> [hereinafter CODATA].
7. Finger & Teodoru, *supra* note 3, at 4; CODATA, *supra* note 6, at 4.
8. Finger & Teodoru, *supra* note 3, at 4.
9. See generally Convention Relative au Statut du Fleuve Senegal [Convention on the Statute of the River Senegal], March 11, 1972, signed at Nouakchott, Sen-Mali-Mauritania, LEX-FAOC016004, available at <http://faolex.fao.org/docs/texts/mul16004.doc> [hereinafter 1972 Statute]. See text accompanying notes 82–90 *infra* for a discussion of the earlier conventions.
10. *Id.*
11. See generally Convention Portant Creation de L'Organisation Pour la Mise en Valeur de Fleuve Senegal [Convention Creating the Organization for the Development of the River Senegal—OMVS], March 11, 1972, signed at Nouakchott modifiée par la Convention portant amendement du 17 novembre 1975, Sen.-Mali-Mauritania, LEX-FAOC016003, available at <http://faolex.fao.org/docs/texts/mul16003.doc> [hereinafter 1972 OMVS Convention].

- Carry out the purposes of the Statute;
- Promote and coordinate studies and development of the river basin;
- Complete any technical or economic studies requested by the Member States; and
- Create a legal entity with legal capacity to carry out these purposes.¹²

These instruments create a system for decision making for the Senegal River basin, a formal structure of consultation and coordination among the Member States.¹³ The three states agreed to the principles of equitable utilization, coordinated development, and prior notification in the 1972 Conventions. The Member States also relinquished sovereign control over the river and the river dependent resources and vested that control in the basin institution, l'Organisation Pour la Mise en Valeur du Fleuve Senegal (OMVS).

The 1972 Conventions were some of the first agreements in the world for comprehensive river management including non-navigational and navigational uses.¹⁴ The Conventions addressed the major legal principles for non-navigational uses of an international watercourse and served as examples of basin cooperation for the International Law Commission when it drafted the 1997 U.N. Convention on the Law of the Non-Navigational Uses of International Watercourses.¹⁵

The legal advisor to the OMVS and a leading scholar in international water resources described the 1972 conventions thus: "The three West African governments of Mali, Mauretania [sic], and Senegal (the 'Member States') are engaged in an experiment in international organization that is not only following the most advanced concepts of integrated river basin development, but which may also afford a lesson in cooperation on a broad scale."¹⁶

Commentators, including Stephen McCaffrey, the Special Rapporteur to the International Law Commission, lauded the cooperative framework, unity of purpose, and integrated management.

12. *Id.*

13. Guinea was offered an opportunity to participate in OMVS but declined at that time. Theodore Parnall & Albert E. Utton, *The Senegal Valley Authority: A Unique Experiment in International River Basin Planning*, 51 *IND. L.J.* 235, 237 n.5 (1976).

14. The concepts related to navigation are not discussed in this article except as they relate to problems encountered by the OMVS in establishing a river management régime to accomplish multiple purposes.

15. *Third Report on the Law of the Non-Navigational Uses of International Watercourses*, ¶¶ 285-336 & add.1-2, U.N. Doc. A/CN.4/406, reprinted in II(2) *Y.B. INT'L L. COMM'N* 21 (1987) (Stephen C. McCaffrey, Special Rapporteur) [hereinafter *ILC Third Report*].

16. Parnall & Utton, *supra* note 13, at 237.

McCaffrey wrote, "The fundamental principles and institutional framework established by the Statute-OMVS Convention régime thus represent an advanced, highly developed planning approach to the management of international water resources."¹⁷

In 1978, the Member States of OMVS entered an additional convention titled the Legal Status of Common Works. Through this convention, the Member States took extraordinary action to establish joint ownership of the river works, giving each state equal right to all works.¹⁸ The 1978 Works Convention declared Manantali Dam; Diama Dam; the fluvio-maritime port of Saint-Louis, Senegal; the river port of Kayes, Mali; the harbors; and the installations in the navigable channel common and indivisible property of the Member States of OMVS.¹⁹ The management of these common works vested in OMVS, which contracts for the construction and operation of the works.²⁰ Each of the Member States pledged to take such legislative, legal, and administrative action as necessary to provide to the OMVS the lands needed for construction of the common works. Each Member State also pledged not to regulate or tax any of the OMVS works or construction activities.²¹ OMVS annually apportions the operating costs for all works among the Member States based on the benefit received by each state from the project.²²

The 1978 Works Convention provides that "the rights and obligations of the States joint owners are founded on the principles of equality and equity."²³ This legal régime is different from any of the four major theories of watercourse law that are based on state sovereignty, absolute territorial sovereignty (the Harmon Doctrine), absolute territorial integrity, or limited territorial sovereignty or community of interests.²⁴ The Member States relinquished their sovereign control and even their ownership of the land and the river works to the OMVS,

17. *ILC Third Report*, *supra* note 15, ¶ 28.

18. *See generally* Convention Conclue Entre le Mali, la Mauritanie et le Senegal Relative au Statut Juridique des Ouvrages Communs [Convention Concluded between Mali, Mauritania and Senegal Relating to the Legal Status of Common Works], Dec. 21, 1978, signed at Bamako, LEX-FAOC016005, arts. 1, 3, *available at* <http://faolex.fao.org/docs/texts/mul16005.doc> [hereinafter 1978 Works Convention].

19. *Id.*

20. *Id.*

21. *Id.*

22. *Id.*

23. *Id.*

24. *See generally* STEPHEN C. MCCAFFREY, *THE LAW OF INTERNATIONAL WATERCOURSES NON-NAVIGATIONAL USES* 112 (2001). For a discussion of the theoretical bases of the law of international watercourses, see *id.* ch. 5.

which is far more than would be expected under the most cooperative theories of basin management or good neighborliness.²⁵

Through these three Conventions, the 1972 Statute, the 1972 OMVS Convention, and the 1978 Works Convention, the Member States created an institution with legal capacity and authority to develop the Senegal River and to provide economic development for the basin. Using the waters of the Senegal River, the OMVS was to move the basin states from an economically developing region to a developed region with a reliable food supply, sufficient electric power, and transportation corridors to the interior.

As laudable as the Conventions of the 1970s are, the next section examines the problems that occurred immediately following development of the river under this régime.

A. Dam Development and the Problems That Followed

Over a period of ten years, the OMVS conducted studies, gathered and analyzed data, obtained financing, and began construction on two dams. The upstream dam was completed in 1987 on the Bafing tributary at Manantali in Mali.²⁶ The dam created an 11.3 billion cubic meter reservoir from which water is released for irrigation, for hydropower production, and to maintain a navigation channel.²⁷ The second dam is 27 km upstream from the Atlantic Ocean, inland from Saint-Louis. This dam stops saltwater from flowing up the riverbed during the dry season and during droughts and maintains the navigation channel. This dam at Diama was completed in 1986.²⁸

The two dams were designed to maintain a minimum water level in the river for year-round irrigation in the valley and in the lower reaches on reclaimed delta lands. The minimum water level is also required for year-round navigation upstream to Mali. Both dams began operation soon after completion of Manantali in 1988. Hydropower production was delayed approximately ten years until turbines were installed at Manantali in 1997.²⁹

Within the first year after Diama Dam became operational, the people living near the new irrigation projects in Richard Toll, Senegal,

25. Compare 1978 Works Convention, *supra* note 18, and 1972 OMVS Convention, *supra* note 11, with 1997 United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses, U.N. Doc. A/RES/51/869, reprinted in 36 I.L.M. 700 (1997) [hereinafter 1997 U.N. Convention].

26. CODATA, *supra* note 6, at 6.

27. *Id.*

28. *Id.*

29. *Id.*

and at other locations along the river suffered a significant increase in waterborne diseases.³⁰ The most serious waterborne disease to appear was intestinal schistosomiasis.³¹ The life cycle of schistosomiasis requires a host snail. The permanent pools of fresh water in the riverbed and irrigation canals (without the traditional river cycle with a dry riverbed and saltwater intrusion upstream) created the optimum conditions for the host snails to thrive.³² A study of the people living along the lower reaches of the river, conducted six years after the dams became operational, indicates that "[b]y 1994 a significant proportion (more than 90 percent) of the population living along the Diama reservoir was infested. Several surveys conducted in communities near Richard Toll showed that virtually everyone above five years of age had *S[histosomiasis] mansoni* infestation."³³

Intestinal schistosomiasis (*bilharzia*), malaria, and cholera also increased dramatically during this same time period, all because of the pools of fresh water.³⁴ Within the first two years of operation, in 1988 and 1989, a random field study of 1,000 people in the vicinity of Diama Dam showed a 60 percent prevalence of intestinal schistosomiasis that was not present in this location before Diama Dam.³⁵ By 1994, 90 percent of the people living near Diama reservoir were infested.³⁶ Malaria was present before the dam construction, but the year-round standing water dramatically increased the mosquito breeding grounds.³⁷ Cholera epidemics, which in the past occurred only during the rainy season, became quasi endemic.³⁸ The increase in disease led one commentator to estimate that, following construction of Manantali and Diama Dams, the

30. *Id.* at 22.

31. *Id.* at 24.

32. *Id.*

33. *Id.* at 23.

34. World Water Assessment, *supra* note 4, at 459.

35. Finger & Teodoru, *supra* note 3, at 11.

36. CODATA, *supra* note 6, at 23.

37. World Water Assessment, *supra* note 4, at 459. The World Health Organization reports that "[i]mproper planning of dam and irrigation projects has led to rapid intensification of transmission of malaria and schistosomiasis: for example, in development areas of the Senegal River Basin schistosomiasis prevalence shot up from 0 to 90% in a period of less than 2 years." World Health Organization, *Celebrating Water for Life, The International Decade for Action, 2005–2015, An Advocacy Guide* 20 (2005), available at http://www.who.int/water_sanitation_health/en/2005advocacyguide.pdf.

38. Olivier Hamerlynk et al., *An Alternative to the Water Management of the Senegal River* 6 (World Comm'n on Dams, Serial No. INS131), <http://www.dams.org/kbase/submissions/showsub.php?rec=ins131> (last visited June 7, 2006).

human health costs were greater than all the economic benefits of increased irrigation and navigation potential.³⁹

Waterborne parasites also infested livestock. The same conditions that permit the host snails for schistosomiasis to thrive permit animal parasitic diseases to proliferate. By 2002, the cattle along the lower reaches of the river had increased infestations of fasciolosis, paramphistomosis, and schistosomiasis. The hardest hit livestock were the small ruminants, goats and sheep, which have an incidence of fasciolosis as high as 62 percent.⁴⁰ Each of these parasitic diseases causes weight loss and death, resulting in an overall decrease in meat and milk production for the region.

Other food supplies also declined. Fish are the major source of protein for the local population. Before the dams an estimated 30,000 metric tons of fish were caught in the river and along the floodplain.⁴¹ The native fish were decimated soon after Diama Dam became operational because it cut off access to the estuarine environment required for breeding. However, other freshwater fish have gradually replaced the native fish species and the catch is increasing.⁴²

The most significant and well-documented changes occurred in the agricultural cycle. For centuries prior to damming the Senegal, the local populations practiced recession agriculture. The river flooded in the rainy season and, when the waters receded, cereal crops were planted in the wet and fertile floodplain. At the same time, the livestock were moved away from the floodplain to pastures. The cereal crops required little maintenance as they thrived in the wet soil rich with nutrients from the sediments deposited by the floods. The people were free to spend time herding livestock, fishing, and gathering wood from the acacia trees for charcoal or construction and to participate in other domestic activities. The people returned to harvest the cereal crops and the livestock were moved back onto the floodplain to graze on the plant stubble.⁴³

This low-cost production system supported a larger population of humans and animals than is normally possible in a semi-arid environment. In all likelihood, this was the system of production that the

39. S. Sow et al., *Water-related Disease Patterns Before and After the Construction of the Diama Dam in Northern Senegal*, 96 ANNALS TROPICAL MED. & PARASITOLOGY 575 (2002). This statement, made in 2002, does not include hydropower production from Manantali.

40. CODATA, *supra* note 6, at 24.

41. USAID, *The Future of the Senegal River Basin: Making the Right Decisions Now* (May 28, 2003), available at http://frame.irglt.com/ev.php?ID=4280_201&ID2=DO_TOPIC [hereinafter *The Future*].

42. Hamerlynk et al., *supra* note 38.

43. *The Future*, *supra* note 41, at 2.

Andalusian historian al-Bakri described 1,000 years ago. Despite more than ten centuries of continuous use, it continues to this day to produce crops with no evidence of soil degradation.⁴⁴

Reports indicate that in the early years of dam operation the OMVS planned to release water from Manantali Dam to artificially replicate the annual floods. Some years artificial flooding permitted recession farming, but some years there were not any flood releases; other years the floodwaters were released during the wrong season and, on occasion, floodwaters were released twice during the same growing season, destroying the seedling crops.⁴⁵ This inconsistency devastated the recession farming. It also contributed to the loss of livestock. Without recession farming there was no field stubble for pasturage and the pasturage away from the river was cleared for irrigated rice fields.⁴⁶

Even wood gathering declined. The stands of acacia trees were cleared for rice fields. Many of the remaining trees died from a lack of water when the annual floods no longer replenished the water table to a level high enough to reach the roots of the acacia.⁴⁷

Each of these problems—waterborne disease for humans and livestock, loss of recession agriculture, loss of pasturage for livestock, and loss of acacia forests—had devastating human consequences. Additionally, the economic costs may not be outweighed by the benefits provided from the development of river resources as planned by the Member States when the OMVS was created in 1972.

B. OMVS Goals for Development and the Resulting Benefits

In the 1970s, the OMVS established three specific goals for Manantali and Diama Dams:

- Generate 800 gigawatt-hours of electricity per year guaranteed nine out of ten years with 1,500 km of transport line to provide energy delivery to the three member states;

44. *Id.*

45. Adrian Adams, *A Grassroots View of Senegal River Development Agencies: OMVS, SAED 5* (World Comm'n on Dams, Serial No. SOC094), at <http://www.dams.org/kbase/submissions/showsub.php?rec=soc094> (last visited June 7, 2006).

46. *The Future*, *supra* note 41, at 2.

47. Hamerlynk et al., *supra* note 38, at 4.

- Increase the amount of area irrigated by pumps⁴⁸ in Mauritania and Senegal from less than 50,000 hectares to 375,000 hectares with two rice crops per year; and
- Provide landlocked Mali with direct access to the sea by maintaining a minimum constant flow of 200 cubic meters per second, building a boat lock and port, and deepening the river.⁴⁹

Thirty years after the formation of OMVS and approximately ten years after Manantali and Diama Dams became operational none of the above goals were fully realized.

1. Power Production

Hydropower production was limited by available financing. Cost overruns for construction of Manantali delayed installation of the turbines and construction of the distribution power lines. The turbines were installed in 1997 and 1300 km of transmission line were completed in 2001. The first power was delivered to Bamako, Mali, in January 2002; Dakar, Senegal, in July 2002; and Nouakchott, Mauritania, in November 2002.⁵⁰

2. Irrigation

Irrigated acreage for rice production has not yet reached the goal of 375,000 hectares. The costs for rice production are significantly higher than recession agriculture and include clearing and leveling land and building extensive berms around fields to facilitate irrigation. Two very invasive exotic plants, *salvinia molesta* and *typha australis*, introduced soon after Diama Dam was operational, became so prolific that they clogged irrigation ditches and caused damage to canals and pumps. Granivorous birds flocked to the rice fields and consumed as much as 50 percent of the harvestable crop.⁵¹ This increase in bird population is linked to the year-round fresh water, the year-round food supply, and

48. The reference to pumps is not to groundwater use, but to the irrigation that requires the water to be lifted from the riverbed by pumps, which is contrasted to recession agriculture using flood flows.

49. CODATA, *supra* note 6, at 7; Finger & Teodoru, *supra* note 3, at 7.

50. The World Bank, *Project Appraisal Document on a Proposed Grant from the Global Environment Facility Trust Fund to the OMVS for the Senegal River Basin Water and Environmental Management Project 130*, Report No:26632-AFR (Oct. 3, 2003), available at http://www-wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2003/10/10/00012009_200310101730/Rendered/PDF/266320CORR.pdf.

51. Hamerlynk et al., *supra* note 38, § II.1.

the nesting and breeding grounds created by the invasive exotic plants.⁵² Increased salinity of the soil also contributed to lower than expected rice production. The land near Diama Dam is the historic delta of the Senegal River, with hyper-saline water within a meter of the surface. The salt leached to the surface after only a few irrigation periods, reducing production and making some fields unusable. Rice production in 2003 was estimated at four tons per hectare, one-third of the twelve tons per hectare per year projected for these lands.⁵³

Taking into consideration the financial and labor costs for dam construction and added costs for field preparation and irrigation, costs for food production increased significantly and the amount of food produced in the Senegal Valley declined in the ten years following completion of the dams.⁵⁴

3. Navigation and Other Problems

Navigational improvements have not been constructed. A boat lock was completed at Diama Dam, but the financial investments for navigational improvements including docks and channelization have been postponed.

Other problems reported as a result of the river management régime include displacement of local farmers by large agricultural interests, causing a significant portion of the male population to migrate to the cities. Ecological destruction of the wetlands at the delta is caused by the lack of freshwater downstream of Diama Dam creating a hyper-saline environment and the wetlands upstream of Diama Dam are devastated by the invasion of exotic plant species. These wetlands include four Ramsar sites: Djoudj, Bassin du Ndiael, and Guembeul in Senegal and Parc National du Diawling in Mauritania.⁵⁵

The tremendous social, economic, and ecological problems associated with river development were recognized by the leadership of the Member States and the international community and are being addressed by the OMVS with a new Water Charter. However, in retrospect, were there omissions from the highly touted legal structure of OMVS that might have prevented or at least predicted the numerous and

52. *Id.*

53. *Id.* § II.

54. *The Future*, *supra* note 41, at 3.

55. See World Water Assessment, *supra* note 4. As of March 2006, there are nearly 1,600 Ramsar sites, wetlands entered on the List of Wetlands of International Importance maintained under the Convention on Wetlands of International Importance especially as Waterfowl Habitat, Feb. 2, 1971, TIAS 11084, 996 U.N.T.S. 245, available at <http://www.ramsar.org> (generally known as the Ramsar Convention).

devastating problems or are they simply a catastrophe of unintended and unavoidable consequences? The next section examines two legal principles that might have been used to avoid the problems: preparation of an environmental assessment for major works and the emerging law of sustainable development. The section then outlines the development of OMVS as a river management institution and its response to the problems.

II. 1963 TO 2002—A RETROSPECTIVE LOOK AT THE SENEGAL RIVER RÉGIME

This section looks back at the Conventions of the 1970s with the hindsight of knowing the problems that developed and with the clairvoyance provided by the 2002 Water Charter drafted to remedy those problems. The first part of this section discusses two concepts recently accepted in environmental law that were not included in the Senegal Conventions when OMVS built Manantali and Diama dams but which might have prevented the problems or provided authority to implement remedies: preparing an environmental assessment and development within the confines of sustainability.

The next part of this section looks back at the institutions of OMVS beginning in 1963 with the Bamako Convention and then moving forward through the different basin agreements from the 1970s to the 2002 Water Charter. The last part of this section examines the legal capacity of the OMVS institutions to address development problems.

A. Environmental Impact Assessments

The 1972 Convention does not call for preparation of an environmental assessment prior to construction of significant projects. The High Commission is responsible for studying proposed development projects and submitting recommendations to the Council of Ministers, but the High Commission is not required to conduct an environmental assessment or an impact analysis.⁵⁶ With hindsight, this appears to be an omission; however, Parnall and Utton report that in 1976 more than 9,000 reports, articles, and texts had been written about the basin.⁵⁷ These included feasibility studies for the dams supported by

56. 1972 OMVS Convention, *supra* note 11.

57. Parnall & Utton, *supra* note 13, at 246 (“[W]ith subjects ranging from hydrology, agricultural development, ecology, and climatology, to customary law and social behavior, [the studies] make the Senegal, on a cubic meter per second basis, probably the most studied river in Africa, if not the world.”).

the U.N. Development Programme and an environmental analysis funded by the U.S. Agency for International Development (USAID).⁵⁸ The USAID environmental assessment presupposed dam construction and limited the scope of its work to maximizing benefits for hydropower, irrigation, and navigation and developing options for relocation of the people and homes flooded by the reservoirs.⁵⁹ Despite all the studies, it does not appear that the human health and agricultural problems were anticipated.

Critics of the OMVS point out that the human health consequences of the projects should have been examined. However, even a comprehensive environmental assessment may not have anticipated the extent of the impact on human health, which was compounded by the introduction of exotic plant species that facilitated the spread and proliferation of host snails for water borne diseases.⁶⁰

OMVS was praised as a progressive multilateral organization in 1972, a time when preparing a comprehensive environmental assessment for a major government project was an idea just beginning to take hold in the United States. The National Environmental Policy Act became law in the United States in 1969⁶¹ but was not fully implemented for another ten years. Preparation of an environmental impact assessment prior to construction of major works was not a common practice in 1972. Omission of this requirement from the 1972 Conventions is not a reasonable criticism. However, this does not relieve OMVS of a general obligation to comply with emerging standards of international law and evaluate the environmental consequences at each successive decision point in the development process. The dams were not completed until 1989 at which time a program of operation was implemented. By this time international law progressed to include an emerging concept that the environmental consequences of major actions and projects, including the impact on human health and the ecosystem, be studied and considered prior to implementation.⁶² A comprehensive evaluation of different flow régimes for releases from Manantali Dam and the environmental and human consequences of those different régimes should have been developed at this later date.

58. Grant Agreement for the Environmental Assessment of the Senegal River Basin (with annex and side letter), U.S.-O.M.V.S., Feb. 25, 1976, 1084 U.N.T.S. 16595.

59. *The Future*, *supra* note 41, at 4.

60. CODATA, *supra* note 6, at 22-25.

61. National Environmental Policy Act of 1969, 42 U.S.C. §§ 4331 et seq. (2000).

62. For a discussion of the emerging obligations to conduct scientific studies and exchange information on environmental consequences, see generally *ILC Third Report*, *supra* note 15, at 136-51.

When the scientific community convened in 2002 to evaluate the health and ecological problems associated with river management, they found that information about the ecosystem prior to dam construction had not been compiled. Therefore, the historical precipitation, depth to ground water, salinity content for the water or the soils, and historic flood patterns were not available.⁶³ This complicated the task of seeking solutions. A comprehensive environmental assessment prepared prior to construction can provide baseline data from which solutions for unanticipated consequences can be developed.

The 1997 U.N. Convention requires that before a planned measure is implemented an environmental impact assessment and the technical data and information for the project shall be provided to states that may suffer a significant adverse effect.⁶⁴ The works on the Senegal River caused significant adverse effects as those terms are used in the 1997 U.N. Convention, but the works are jointly owned and were built with the full participation, financial contribution, and consent of each Member State.⁶⁵ Any Member State that desired additional information before approving construction theoretically could have requested additional studies from the High Commission, which is charged with researching proposed works,⁶⁶ and withheld its vote of approval until such studies were complete.⁶⁷

The 2002 Water Charter imposes the substantive obligation to protect the environment.⁶⁸ It does not require an impact assessment prior to construction or implementation of major works but does require that future projects likely to have a significant impact be submitted to the OMVS High Commissioner, who notifies other Member States.⁶⁹ The

63. CODATA, *supra* note 6, at 30, 31.

64. *See generally* 1997 U.N. Convention, *supra* note 25, art. 12. The 1997 U.N. Convention does require the protection and preservation of the ecosystem, but an environmental assessment is only required to determine significant impacts *to other states*. *Id.*

65. *See id.* The 1997 U.N. Convention would require that Guinea, an upstream state, be provided with the impact studies. *See id.* Guinea did not enter an agreement with OMVS to have observer status until 1992.

66. 1972 OMVS Convention, *supra* note 11, art. 13.

67. *See generally id.* art. 10.

68. *See* Charte des Eaux du Fleuve Sénégal [The Water Charter of the Senegal River], adopted by the Conference of Heads of State and Government, Organisation pour la Mise en Valeur Du Fleuve Senegal (OMVS), May 18, 2002, OMVS Resolution 005, art. 24, *available at* http://lafrique.free.fr/traites/omvs_200205.pdf (official text in French, unofficial English translation on file with author) [hereinafter 2002 Water Charter].

69. *Id.* arts. 16–18. For a list of objectives that includes the environment as an acceptable use of water and rules for the protection of the environment, see also *id.* art. 2. Environmental concerns are also included in Article 5 regarding distribution among sectors

States then have an opportunity to respond. The 2002 Water Charter also calls for OMVS to develop an Environmental Action Plan.⁷⁰ The Plan requires evaluation of water quantity and quality annually in order to alter the distribution of water in times of shortage, to regulate and monitor water use, and to identify and monitor sources of pollution.⁷¹

The OMVS is now obligated to develop “rules relating to the preservation and the protection of the environment, particularly with regard to the wildlife, the flora, the ecosystems of the flooded plains and the wetlands.”⁷² This should provide more ecological protection than the mere preparation of studies.

B. Sustainable Development

Given the ecological, economic, and human health consequences, Manantali and Diama dams do not appear to be sustainable developments. Sustainable development is a concept articulated by the World Commission on Environment and Development in the 1987 Brundtland Report to mean development that meets present needs without compromising the ability of future generations to meet their needs.⁷³ Sustainable development was not a politically viable concept in the 1970s when the OMVS was organized; the 1972 and 1978 Conventions do not contain the word “sustainable.”

The concept of sustainability is broad and non-specific. Its inclusion in a multilateral convention provides flexibility for adjustments to the river management régime over time. Without a concept such as “sustainability” in the 1972 and 1978 Conventions, the OMVS may not have the authority to alter river management to protect the health, environment, or ecology of the region if such changes detrimentally impact one of the three goals of OMVS: hydropower production, expanded irrigation, and navigation inland to Mali.

By the time the 1997 U.N. Convention was approved by the General Assembly, sustainability of development was considered an emerging international norm.⁷⁴ This convention states as a General Principle that “an international watercourse shall be used and developed

and Article 7 water distribution as well as the overall objectives and purpose of the 2002 Water Charter to restore the ecological balance. *Id.* arts 5, 7.

70. See 2002 Water Charter, *supra* note 68, arts. 16–18 (Pt. 4: Environmental Protection and Preservation).

71. See *id.* art. 17.

72. *Id.* art. 2.

73. See WORLD COMM'N ON ENV'T & DEV., OUR COMMON FUTURE (1987).

74. See generally IAN BROWNLIE, PRINCIPLES OF PUBLIC INTERNATIONAL LAW 276 (6th ed. 2003) (including the concept of sustainable development).

by watercourse States with a view to attaining optimal and sustainable utilization thereof and benefits therefrom...."⁷⁵ Furthermore, Article 24 of the 1997 U.N. Convention provides that management of a watercourse means "planning the sustainable development of an international watercourse...."⁷⁶

The 2002 Water Charter adopts the concept of sustainability throughout. The Preamble, stating the reason for the Water Charter, contains the following four references:

- [T]o provide both a *sustainable* and evolutionary framework to common interests between the riparian States of the Senegal River...
- Convinced that the Senegal River, an ecosystem essential to the *sustainable development* of the riparian countries, is to be managed by taking into consideration the water cycle as a whole, as well as the sectorial and intersectorial needs;...
- Considering that water resource distribution between uses, its management and its development will have to take into account the objective of *sustainable development* by associating various actors: users, managers, decision-makers, developers and experts concerned, in a global and integrated approach;...and
- [T]o promote an optimal and *sustainable use* of the resource, which implies users' accountability and an affirmed policy on water economy through an integrated and equitable management, for the benefit of present and future generations.⁷⁷

While the concept of sustainability was not included in the Conventions of the 1970s, it cannot be said that its inclusion would have prevented the problems. However, the inclusion of a principle such as sustainability or environmental protection may have given OMVS

75. 1997 U.N. Convention, *supra* note 25, art. 5, ¶ 1.

76. *Id.* art. 24, ¶ 2(a). The 1997 U.N. Convention discusses the sustainability of development of an international watercourse in the Preamble with the following principle regarding the nature of the 1997 Convention: "Expressing the conviction that a framework convention will ensure the utilization, development, conservation, management and protection of international watercourses and the promotion of the optimal and sustainable utilization thereof for present and future generations...." *Id.* pmbl.

77. *Id.* pmbl. (emphasis added). Compare *id.* with 1972 OMVS Convention, *supra* note 11, pmbl. & tit. I (These broad policy-based statements stand in stark contrast to the language of the 1972 Convention and Statute.).

authority to respond more quickly when it became apparent that the combination of extreme human health and ecological problems along with the loss of recession agriculture rendered life and development along the Senegal River unsustainable. The organic documents creating OMVS did not contain a concept or purpose that authorized action to meet these unexpected consequences. Instead, the OMVS authority is limited to the specific purposes of hydropower production, increased irrigation, and navigability.

The concepts of environmental protection and sustainable development were incorporated in the 2002 Water Charter as adopted by the OMVS. In addition to these substantive changes, the OMVS adapted its institutional structure to meet the new challenges.

C. OMVS Institutions

During its 30-year history, the OMVS has been creatively forward-thinking while at the same time it has been unresponsive to the problems created. The charge to OMVS in the 1972 Statute and 1972 OMVS Convention recognizes that the development needs of each Member State require the cooperation of all three States while protecting the sovereignty of each. Yet the limited and specific purposes of the 1972 Statute did not provide OMVS with the authority to respond quickly to the human health, environmental, and ecological problems that resulted from its management of the river. This section examines the historical development of the OMVS that resulted in this progressive yet limited institution, concluding with the actions that led to the adoption of the 2002 Water Charter.

Soon after the states of the Senegal Basin gained independence from French colonial rule, they entered the first multilateral cooperative agreement, the 1963 Bamako Convention,⁷⁸ which declared the Senegal River to be an international river and organized all four riparian states, Guinea, Mali, Mauritania, and Senegal, for the purpose of coordinated management of the Senegal River Basin. This was soon followed by the 1964 Dakar Convention,⁷⁹ which created a Committee of Ministers

78. See generally *Convention Relative à l'Amenagement Général du Bassin du Fleuve Senegal* [Convention Relating to the General Development of the Senegal River Basin], July 26, 1963, signed at Bamako, U.N. Doc. A/CN.4/274, reprinted in I(2) Y.B. INT'L L. COMM'N, 289 (1974) (containing excerpts).

79. *Convention Relative au Statut au Fleuve Senegal* [Convention Relating to the Status of the Senegal River], Feb. 7, 1964, signed at Dakar, U.N. Doc. A/CN.4/274, reprinted in I(2) Y.B. INT'L L. COMM'N 289 (1974) (containing excerpts). The 1963 and 1964 Conventions are discussed together. The author found discussions and excerpts of both the 1963 and 1964 Conventions but was not able to locate a complete text of either Convention.

charged with notifying any Member State of programs initiated by other Member States, regulating navigation, conducting studies, and executing projects. The Committee also represented the Member States in obtaining international aid. Each riparian state agreed to submit to the Committee any projects that might affect the "conditions of navigability, agricultural or industrial exploitation, the sanitary conditions of its water, and the biological characteristics of its fauna and flora."⁸⁰ These Conventions established a General Secretariat to conduct studies and carry out the policies of the Committee.⁸¹ The General Secretariat created three commissions to carry out project reviews: an administrative and legal commission, a navigation and transport commission, and a commission for hydroelectric and hydro-agricultural problems.⁸²

Prior to implementing any major projects, the four riparian states entered a new convention expanding the purposes for cooperation and correspondingly expanding the institutional structure.⁸³ The 1968 Convention created the Organisation des États Riverains du Senegal (OERS), which reviewed not only river projects but all economic development within the region. The purpose of this 1968 agreement expanded the cooperation beyond river development to include improved education, transportation, telecommunications, and even judicial cooperation.⁸⁴ The institutions governing the Senegal basin were also expanded to include a Conference of Heads of State and Government, with one representative from each Member State, the Council of Ministers with two additional representatives from each Member State for a total of three representatives and the creation of an advisory branch called the Inter Parliamentary Commission with five representatives from each Member State. The Secretariat also expanded and reorganized to include not only the three Commissions created under the 1963 and 1964 Conventions but two additional General Secretariats, one for Planning and Development and one for Education.⁸⁵

80. *Id.* ¶ 47.

81. *See generally* Organogram 1—1963, *infra* (illustrating this organization).

82. *See* Parnall & Utton, *supra* note 13, at 239. The Intergovernmental Committee for the Development of the Senegal River Basin was the first basin authority to be given the power to approve projects of the basin states. After the 1964 Convention, the Committee began to conduct various studies on river basin development. In 1968, the Committee expanded its jurisdiction to include all economic development in the region. *Id.*

83. *See* Statut de l'Organisation des États Riverains du Senegal [Statute of the Organization of the Senegal Riparian States—OERS], Mar. 24, 1968, signed at Labé, No. 9577, 672 U.N.T.S. 251 (1969).

84. *Id.* art. 1.

85. *See generally id.* *See also* Organogram 2—1968, *infra* (illustrating the organization).

In their 1976 article, Parnall and Utton state that several factors led to the collapse of OERS: its scope was too broad, it was unable to obtain financing for major works for river development, and Guinea withdrew from membership.⁸⁶ The OERS formally dissolved with the formation of L'Organisation Pour la Mise En Valeur Du Fleuve Senegal (OMVS) in 1972.

D. 1972 Conventions

On March 11, 1972, the states of Mali, Mauritania, and Senegal entered two new conventions, the Convention on the Statute of the River Senegal⁸⁷ and the Convention Creating the OMVS,⁸⁸ scaling back the ambitious purposes of the 1968 Convention and limiting the authority of the OMVS to river development. The Member States once again declared the Senegal River to be an international river with equitable access to all states.⁸⁹ Guinea, the upper-most basin state, did not enter the 1972 Conventions.

The OMVS institutions are based on those established in 1963 and 1968. At the top of the organizational chart is the Conference of Heads of State and Government, with one representative from each of the three Member States.⁹⁰ As with the Conference under the 1968 Convention, all decisions must be unanimous, and the Conference sets the broad policies affecting the Senegal River. Decisions of the Conference are binding on all Member States.⁹¹

The 1972 OMVS Convention also creates a Council of Ministers with one Minister from each Member State.⁹² The decisions of the Council must be unanimous and are binding on all Member States.⁹³ This is particularly important because the Council has the authority to obtain financing for projects and to bind the Member States to repayment obligations.⁹⁴ The Council also fixes the budget for OMVS and apportions the financial contributions among the Member States according to the proportion of benefit each State receives.⁹⁵

86. Parnall & Utton, *supra* note 13, at 238–39.

87. 1972 Statute, *supra* note 9.

88. 1972 OMVS Convention, *supra* note 11.

89. See 1972 Statute, *supra* note 9, art. 1.

90. 1972 OMVS Convention, *supra* note 11, art. 3.

91. *Id.* art. 5.

92. *Id.* art. 8.

93. See generally *id.* art. 10.

94. See generally *id.* (The President of the Council of Ministers can take the required measures necessary to safeguard the interests of the Organization.).

95. See 1978 Works Convention, *supra* note 21, art. 12.

The Council's decisions are carried out by the Office of the High Commission, which is the technical and executive body of the OMVS.⁹⁶ The High Commission receives proposals for projects and for water uses from Member States that are sent to the Permanent Water Committee for evaluation and recommendation. The Permanent Water Committee issues advisory recommendations to the Council, which has final authority to approve river related activities.⁹⁷ The OMVS is charged with carrying out such missions as the Member States entrust to it and carrying out the three purposes of the 1972 Statute; hydropower production, irrigation, and navigation.

Parnall and Utton describe the operation of the OMVS as smooth and effective, as demonstrated by the Council's quick approval of Diama Dam in July 1972, four months after the formation of the OMVS.⁹⁸ The High Commission conducted the feasibility studies for Diama Dam, which were compiled and reviewed by an ad hoc commission of experts. The ad hoc commission then submitted the project to the Council with a recommendation for approval.⁹⁹

It is not clear when the decision was made to dam the Senegal River. However, Parnall and Utton report that the OMVS Council of Ministers ratified the decisions of the OERS to construct a dam at Manantali; to construct a dam at the delta; to improve the river-ocean port at Saint Louis, Senegal; to create a river port at Kayes, Mali; and to improve the river for navigation, including channelization—all at their first meeting.¹⁰⁰

Neither the 1972 Statute nor the 1972 OMVS Convention contains provisions for regulating river flow or a river management régime. Article 5 of the 1972 Statute provides that the Member States will enter a special convention to define the conditions for implementation and operation of any common works.¹⁰¹

In anticipation of building the works outlined above, the Member States entered the Convention Relating to the Legal Status of

96. 1972 OMVS Convention, *supra* note 14, art. 11. High Commission is sometimes translated as General Secretariat.

97. *Id.* art. 21. See also Organogram 3—1972, *infra* (illustrating the organization).

98. See Parnall & Utton, *supra* note 13, n.55.

99. This is also an example of the idea that construction of dams on the Senegal was determined prior to the 1972 Conventions and that the primary purpose of the Conventions was to construct the dams that had been planned for many years. This comment by Parnall and Utton also points out the difference between feasibility studies and environmental assessments. *Id.*

100. Parnall & Utton, *supra* note 13, at 247.

101. See generally 2002 Water Charter, *supra* note 68, pmb1. The OMVS authorized the Society for the Management of Diama and the Society for the Management of Manantali by Conventions in 1997 as referenced in the Preamble. *Id.*

Common Works on December 21, 1978.¹⁰² The 1978 Works Convention created joint ownership in common among the Member States for all works on the river. Each Member State granted the others equal access to works within their territory without state regulation or taxation. The Member States also pledged to take such legislative action as necessary to carry out the purposes of the Convention and to make land available to OMVS to complete the planned projects. This is a remarkable convention in that the states of Mali, Mauritania, and Senegal grant joint ownership to each other of the dams, the port, and other river works that may be wholly within one state.

Joint ownership is not without its drawbacks and may make it more difficult to alter the river flow to respond to the unanticipated problems. While each country has representatives at all levels of OMVS, this provides each Member State with a veto power but the Member States do not retain the independent authority to act. Further complication stems from the three separate purposes for the OMVS, hydropower production, irrigation, and year round navigation, each with different levels of importance for each Member State. The management difficulties are elucidated by the following examples.

The purpose of the OMVS, to provide a navigation corridor to Mali, requires a minimum "pool" of water between the two dams. It is this body of freshwater that creates the habitat for the snails that carry the waterborne diseases that have devastated the health of communities around Diama Dam, particularly in Senegal. Under the 1972 Conventions, the OMVS does not have the authority to forgo the navigational goal, most important to Mali, in favor of a flow régime that would permit the river to be dry part of the year in order to kill the snails and improve public health in Senegal.

The purpose mandating hydropower production provides another example. Releases for hydropower can be synchronized with flows for navigation and irrigation once the body of water behind Manantali and between the Manantali and Diama dams is established. But management for hydropower may not be consistent with a plan to permit recession agriculture. The seasonal need for an artificial flood may not match the need for power production if the artificial flood significantly lowers the pool of water available for release through the turbines at Manantali.

In addition to these foundational issues, the leadership of OMVS is criticized as being dominated by hydropower and large agricultural

102. See generally 1978 Works Convention, *supra* note 18.

interests.¹⁰³ However legitimate this criticism may be, it is to be expected that an organization in which two of its three purposes are power production and large-scale irrigation will be dominated by individuals from those industries. Decisions of the OMVS are further complicated by the fact that the revenue generated from hydropower and water sales to large-scale irrigation projects is used to reduce the financial contributions required from the Member States.

The political structure of the OMVS is also removed from public participation. All members of the Council of Ministers are appointed by their respective governments without direct accountability to an electorate. This also may slow response to local problems. Despite these concerns, the OMVS did seek solutions using the existing institutional organization.

1. PASIE

In 1997, the OMVS created an environmental mitigation and monitoring program, the Programme d'Atténuation et de Suivi des Impacts sur l'Environnement or PASIE, which is charged with the following tasks related to the operation of Manantali Dam:

- Develop monitoring and mitigation activities related to energy production at Manantali;
- Develop the means to implement these activities; and
- Review and define the respective jurisdiction of the agencies within OMVS to implement these activities.¹⁰⁴

These studies are limited to determining the consequences of power production but do include environmental components. To implement these goals, PASIE includes six subprograms, three of which relate directly to river management:

- *Optimal Reservoir Management Programme* to develop water resource management for the river taking into account the environmental concerns of the Member States;
- *Environmental Sanitation Programme* to address the waterborne diseases and general sanitation; and
- *Monitoring, Coordination and Communication Programme* to monitor environmental impacts with participation from non-governmental organizations and local populations.¹⁰⁵

103. See generally Adams, *supra* note 45.

104. See Seydi Ahmadi Diawara, *L'OMVS, Une Expérience de Gestion de Cours d'Eau Partagé*, § 5 (World Comm'n on Dams, Serial No. INS118), at <http://www.dams.org/kbase/submissions/showsub.php?rec=INS118> (last visited June 7, 2006).

The results from PASIE and from numerous independent studies and information from the Member States formed the basis of the Water Charter, which was approved by the Conference of Heads of State in May 2002.

III. THE 2002 WATER CHARTER – A PROSPECTIVE LOOK AT THE SENEGAL RIVER

The cooperative institutions established soon after the states of the region gained independence from colonial rule in the 1960s carry the region forward to each changing circumstance and provide the means to discuss and revise the basin initiatives to meet each new challenge. The Member States of the OMVS made the decision in the 1963 Bamako Convention that all would benefit by development of the basin in ways that none could accomplish alone. Each subsequent agreement solidified this cooperation. The established institutions and the history of cooperation enable the Member States to reach consensus to revise the purposes of OMVS and to revise the objectives for management of the Senegal River.

With the assistance of the World Bank, non-governmental organizations, and other financial institutions, the OMVS revised its purpose and objectives under a new Water Charter in 2002.¹⁰⁶ The Water Charter was adopted by the Conference of Heads of State under authority established in the 1972 OMVS Convention. The decision of the Conference was based on a resolution from the Council of Ministers, which worked with the High Commission to draft the Water Charter,¹⁰⁷ indicating the continued effectiveness of the institutions of OMVS. Guinea has not yet entered the OMVS Conventions, but the 2002 Water Charter recognizes this absence and provides that Guinea may join at any time.¹⁰⁸

The 2002 Water Charter may be viewed as the modern version of what was in 1976 “the most advanced concepts of integrated river basin development....”¹⁰⁹ The Preamble to the 2002 Water Charter recites the long history of cooperation and respects the path chosen by the Member States for management of the Senegal River. It does not start over with a clean slate or new institutions; rather, it is a modernization of the

105. *Id.* (The other three subprograms address power transmission lines and stations.).

106. *See generally* 2002 Water Charter, *supra* note 68.

107. *Id.* pmb1. For the flow of decision making within the OMVS, see also Organogram 3, *infra*.

108. Guinea signed a Protocol for observer status to OMVS in 1992 (notes on file with author). For the current status, see *supra* note 2.

109. *See* Parnall & Utton, *supra* note 16, at 237.

management principles established in 1963 undertaken in light of the very serious problems experienced in the basin. As discussed in the next section, the 2002 Water Charter establishes the policy for water use and water allocation with its scope and purpose broad enough to make future decisions affecting the basin. It also modifies the OMVS institutions to accommodate these changes.

A. Scope and Purpose

The scope of the 2002 Water Charter is described in article 3 as “the whole catchment area of the Senegal River including the affluents, effluents, and associated depressions.”¹¹⁰ It is broader than the 1972 Statute, which covered the Senegal River and its affluents, but still does not include ground water. Ground water is defined in the 2002 Water Charter but is only referenced in Article 17, which requires preparation of a comprehensive study of ground water as part of the Environmental Action Plan.¹¹¹

The 1972 Statute had three specific purposes: production of 800 gigawatts of hydropower, irrigation of 375,000 hectares, and year-round navigation to Mali. The 2002 Water Charter describes the purposes for river management in broad terms that focus on processes instead of specific results. The new objectives for OMVS management of the Senegal River as set forth in Article 2 include:

- “Establishing the principles and mechanisms of distributing the waters of the Senegal River between the different sectors”¹¹² adding fishing, domestic use, health and the environment as sectors.
- *Defining the mechanisms for review of new projects affecting the river;*¹¹³
- “[D]etermining the rules relating to the preservation and protection of the environment, particularly with regard to wildlife, flora, and ecosystems of the flooded plains and the wetlands,”¹¹⁴ and
- *Defining the methods for stakeholder participation.*¹¹⁵

110. See 2002 Water Charter, *supra* note 68, art. 3.

111. *Id.* arts. 1, 17.

112. *Id.* art 2 (emphasis added).

113. See *id.* (emphasis added).

114. *Id.* (emphasis added).

115. See *id.* (emphasis added).

This flexible approach to river management reflects the influence of the 1997 U.N. Convention. It also reflects the reality that, with the long anticipated dams at Manantali and Diama operational, the OMVS must now overcome the adverse consequences of dam construction in order to improve the overall well-being of the region.

The guiding principle of the 1997 U.N. Convention, equitable and reasonable utilization,¹¹⁶ is incorporated into the 2002 Water Charter, but not as envisioned in the 1997 U.N. Convention. The 2002 Water Charter uses equitable principles to allocate water among the competing sectors within the basin, not between the States.

Article 5 addresses distribution among the sectors with two overall guidelines: sub-regional cooperation and integrated management of the resource. Under the 2002 Water Charter, the management of the Senegal River is no longer driven by goals for gigawatts produced and hectares irrigated, but by principles of equity and cooperation. All distributions of water are controlled by the article 4 guideline, which states,

The guiding principles of any distribution of the River's water will guarantee to the populations of the riparian States, the full pleasure of the resource, with respect to the safety of the people and the works, as well as the basic human right to clean water, in the perspective of sustainable development.¹¹⁷

B. Stakeholder Participation

At each level of the OMVS, the governments of the Member States are represented by government leaders or appointed representatives. Not until the 2002 Water Charter is stakeholder input and participation by "the public" permitted. The OMVS now permits limited outside participation of observers to the Permanent Water Committee.

The 2002 Water Charter begins the process for citizen participation and for transparency in decision making by granting certain representative groups the right to petition to become observers. Article 23 provides that, upon the recommendation of the High Commissioner, the Council of Ministers may grant observer status to the Permanent Water Commission for entities that are representatives of users, local communities, non-governmental organizations, and

116. 1997 U.N. Convention, *supra* note 25, art. 5.

117. 2002 Water Charter, *supra* note 68, art. 4.

decentralized management committees. This appears to be a convoluted process requiring approval of the High Commissioner as well as the Council of Ministers in order to observe deliberations of the Permanent Water Commission. However, public observers and access to records by the public provide some opportunity for local involvement and transparency in decision making.¹¹⁸

C. Local Populations

The health problems suffered by the population living along the river are not specifically acknowledged in the 2002 Water Charter. The Charter does acknowledge the human component to river management and addresses it in several articles dealing with distribution of water, safety of the population, and priorities in times of shortage. Article 4 requires that distribution of water give priority to a human right to water and to the safety of the people and that sub-regional cooperation be based on the security and growth in income of the basin's population. Article 6 provides that the technical standards for water distribution set forth in the Annexes to the Water Charter are "secondary to the principle of non-discrimination, to the obligation to satisfy vital needs, and to the safety of the population."¹¹⁹ Article 8 provides that the use of water will be equitable considering among other things the potable water needs of the population, especially the most vulnerable.¹²⁰ These modern legal principles of the law of international watercourses, as articulated in the 1997 U.N. Convention, are fully incorporated in the 2002 Water Charter.

D. Environmental Protection

Environmental protection is a pervasive concept in the 2002 Water Charter. The Preamble "recalls" the recommendations from the 1992 U.N. Conference on Environment and Development in Rio de Janeiro and then moves to more specific principles. The objectives for the 2002 Water Charter are set forth in Article 2 and include establishing rules for the "preservation and the protection of the environment, particularly with regard to the wildlife, the flora, and the ecosystems of the floodplains and the wetlands."¹²¹ These rules must include

118. See generally *id.* art. 13 (ensuring public access to information).

119. *Id.* art. 6.

120. See *id.* art. 9. In times of shortage, a priority must be given to drinking water and domestic use. *Id.*

121. *Id.* art. 2.

distributions of water for protection of the environment¹²² and allocation of water among the sectors to take into account "the integration of the environmental dimension in water management and sustainable maintenance of favorable ecological conditions in the River basin."¹²³

Of considerable importance in maintaining the commitment to environmental protection is the requirement in article 7 that technical standards for water distribution include environmental preservation and protection. Finally, Part 4 provides for the development of a general Environmental Action Plan to respond to water shortages; monitor, suspend, limit, or forbid certain uses; and locate and monitor pollution sources.¹²⁴ Part 4 also covers pollution prevention as well as a requirement that each Member State institute a polluter pays policy as a matter of national law.¹²⁵

E. Institutional Modifications

The 2002 Water Charter maintains the same core institutions of OMVS. It clarifies the role of the Permanent Water Committee and provides for observers. It also clarifies which river projects require OMVS approval and the notification process for such projects.¹²⁶ The Water Charter also confirms that decisions of the Council of Ministers are not subject to review.¹²⁷

An interesting aspect of the 2002 Water Charter is the probationary period for implementation. Article 28 states that the OMVS and the Member States must operate under the provisions of the 2002 Water Charter for a three-year probationary period prior to making any changes to the Charter.

The 2002 Water Charter builds on the most recent principles of the law of non-navigational uses of freshwater resources to address the river related problems experienced in the Senegal Basin while maintaining the existing institutions in order to move the basin forward with an improved process for future decision making.

122. *See id.* art. 4.

123. *Id.* art. 5(2).

124. *See id.* art. 17.

125. *Id.* art. 18.

126. *Id.* art. 24.

127. *See id.* art. 26. *See also* Organogram 4–2002, *infra* (illustrating the changes to the OMVS).

CONCLUSION

The states of the Senegal River Basin moved to independence with the understanding that the Senegal River is integral to their progress toward becoming developed nations. Each state has different goals for the river, but no state is able to accomplish its goals without the cooperation of the others. This remains as true today as it was at independence in the 1960s.

This article has cited to the article by Theodore Parnall and Albert E. Utton extensively throughout. As a conclusion, the following quote is offered as their prescient outlook for the Senegal Basin given in 1976:

No one can predict the outcome of the current efforts being made by Mali, Mauretania [sic], and Senegal to establish an organization capable of realizing the integrated development of the Senegal Basin. Studies have been and continue to be made; the essential international agreements have been entered into and ratified; and at least partially successful attempts to secure the financing of the planned projects have been made. There is no indication that the leadership of the three States, in their ten-year history of seeking to cooperate in the development of the river, was other than sincere in establishing the OMVS. To date [1976], every conflict of interests between the three States has been carefully analyzed and adjusted by the Council of Ministers. Yet, the doubt persists: Will it really work? The three West African States will have to do what no other group of states has yet managed to do, and it remains to be seen whether any truly effective international river authority can survive the political, economic, and social pressures inherent in river regulation. But it may be that a combination of factors favors a positive outcome: the geopolitics of the area, with land-locked Mali dependent upon the Saint-Louis ocean port and Senegal's rail system, and Mauretania [sic] and Senegal, because of the apparently cyclical droughts, dependent upon a regularized flow from Bakal in order to develop their agricultural potential, may leave the Member States no choice other than to continue their spirit of practical cooperation; the limited financial capability of the three Member States, necessitating the seeking of grants and loans for the OMVS from outside sources, may increase the relative authority of the organization; the limited

manpower resources available for the creation and management of river basin development projects may lead to a continued and increased sharing of such resources. An important additional factor is that the three Member States have not yet developed their own national administrative infrastructures with fixed expectations concerning river development.¹²⁸

The lessons learned from the difficulties of Senegal River Basin development are not only those related to legal principles of equitable utilization, or to the need for accurate science or even the need for stakeholder involvement, though each of these is vital; the lessons learned relate to the importance of creating an institution that provides a continuing forum for dialogue and cooperation that is flexible enough to address each new circumstance.¹²⁹

As Parnall and Utton predicted in 1976 in downplaying the need for substantive rules such as the Helsinki Rules, "What is needed is an administrative process, a basin authority which can supervise and make ongoing policy decisions toward efficient resource management. Perhaps uniquely, the OMVS is endowed with this highly desirable planning and management authority."¹³⁰

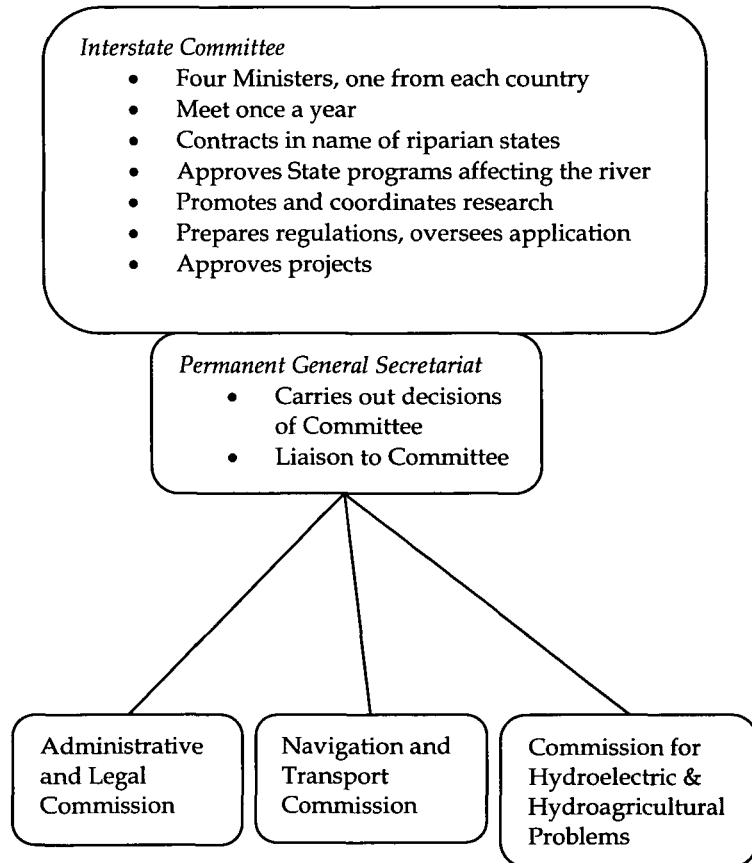
For all the unanticipated difficulties suffered by the people of the Senegal River Basin and suffered by the ecosystems of the region since the inception of the OMVS, its legacy has most certainly been the internal ability to adapt, perhaps not as quickly as desired by the population, but adapt nonetheless, as an institution to address the problems and to meet the challenges of the future.

128. Parnall & Utton, *supra* note 13, at 251.

129. See Christopher L. Kukk & David A. Deese, *At the Water's Edge: Regional Conflict and Cooperation over Fresh Water*, 1 *UCLA J. INT'L L. & FOREIGN AFF.* 21, 51 (1996).

130. Parnall & Utton, *supra* note 13, at 253-54.

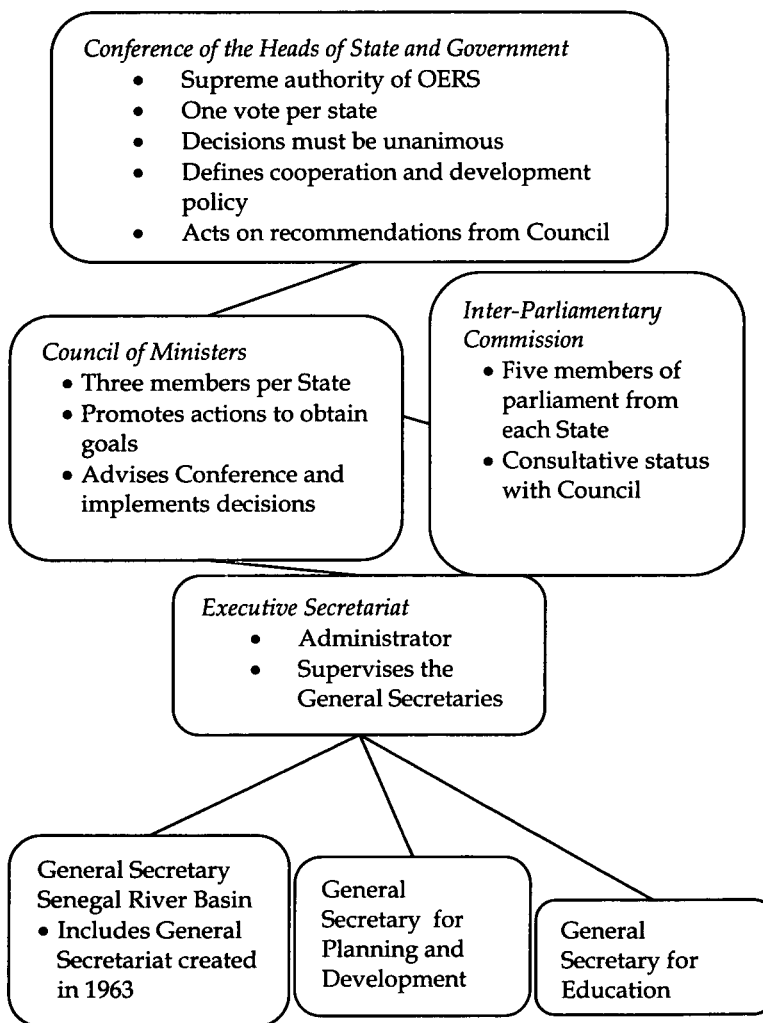
1963 Bamako and 1964 Dakar Conventions¹³¹



Organogram 1 – 1963

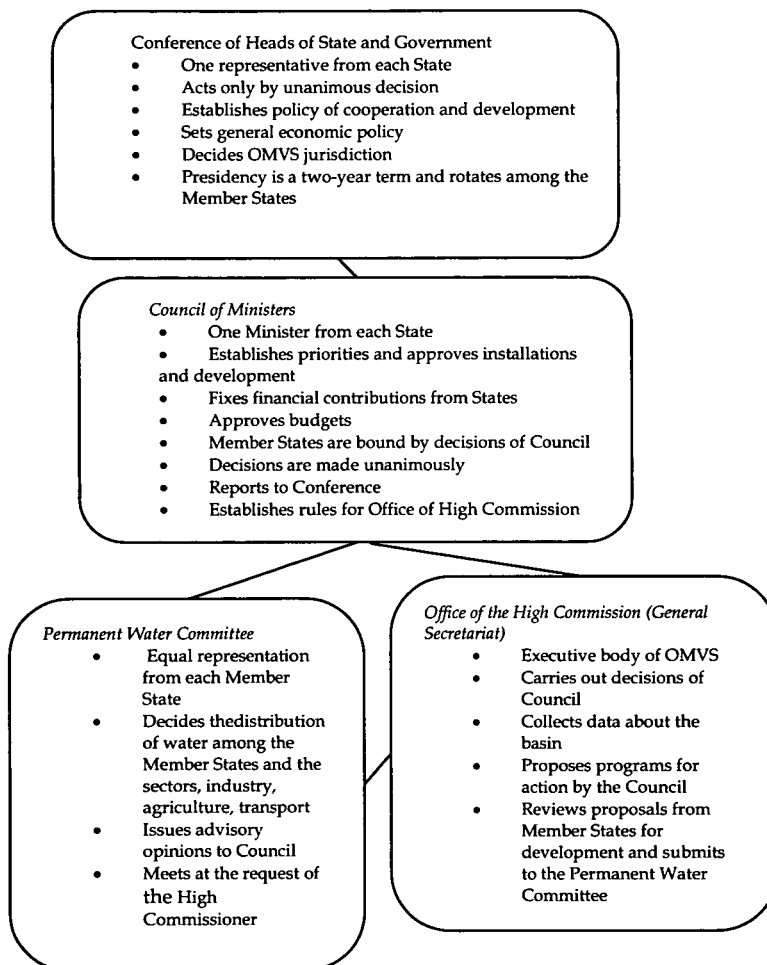
131. These two conventions are treated together for purposes of this organogram. The author was not able to locate the complete text of either convention and secondary resources discuss both conventions together. See UNITED NATIONS, MANAGEMENT OF INTERNATIONAL WATER RESOURCES: INSTITUTIONAL AND LEGAL ASPECTS, REPORT OF THE PANEL OF EXPERTS ON THE LEGAL AND INSTITUTIONAL ASPECTS OF INTERNATIONAL WATER RESOURCES DEVELOPMENT, NATURAL RES./WATER SERIES (NO. 1) at 256, U.N. Sales No. E.75.II.A.2 (1975); Parnall & Utton, *supra* note 13, at 239.

**Statute of the Organization of the Senegal Riparian States
OERS, 1968**



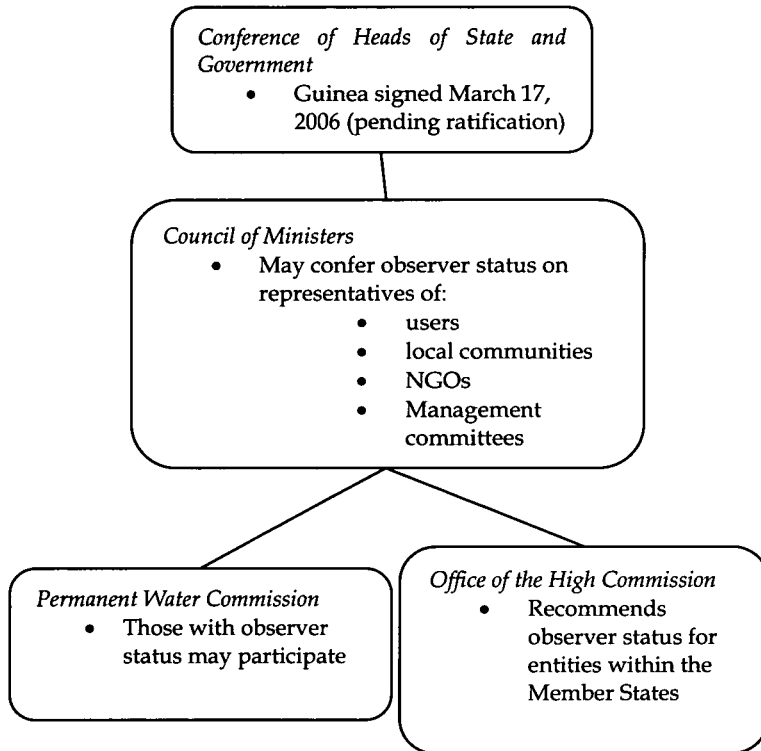
Organogram 2 – 1968

L'Organisation Pour La Mise en Valeur Du Fleuve Senegal OMVS, 1972



Organogram 3 – 1972

2002 Water Charter¹³² Adopted by the Conference of Heads of State on the Recommendation from the Council of Ministers



Organogram 4 – 2002

132. The 2002 Water Charter maintains the same organizational structure as the 1972 OMVS. All references in this chart are to additions to the existing institutions.