

## Contributing Paper

# **Social Impacts of an African Dam: Equity and Distributional Issues in the Senegal River Valley**

Adrian Adams  
Independent Expert, Senegal

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Social Impacts of Large Dams Equity and Distributional Issues

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World Commission on Dams  
5<sup>th</sup> Floor, Hycastle House  
58 Loop Street  
PO Box 16002  
Vlaeberg, Cape Town  
8018, SOUTH AFRICA  
Telephone: +27 21 426 4000  
Fax: +27 21 426 0036  
Email: [info@dams.org](mailto:info@dams.org)  
<http://www.dams.org>

*It was Don Circostanza who found the solution. 'These women claim that half the stream is not enough to irrigate their land. They want more than half, at all events, that is how I interpret their wishes. So there is only one possible arrangement. The Contractor must be left three-quarters of the water of the stream, and the three-quarters of the remainder must be left to the people of Fontamara. Thus both parties will have three-quarters, that is, each will have a little more than half. I appreciate,' he went on, 'that my proposal will inflict great hardship on the Contractor, but I appeal to his heart as a philanthropist and public benefactor.'*

.....  
*No one supposed we were going to be left with as much water as before, but when we saw it actually sinking we all started shouting and cursing the Contractor and the distinguished company. Slowly the level of our water subsided until it filled only half the stream-bed, but it did not stop there.*

Ignazio Silone, *Fontamara*

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## Introduction

From its source in the Futa Jalon hills of Guinea, the Senegal River flows northward through increasingly arid land; by the time it turns westward towards the Atlantic Ocean, it arches against the desert. The less rain there is, the more life depends on the river's flooding the broad alluvial plain of the Middle Valley, (600 kilometres long from Bakel to Rosso and 5 to 25 kilometres wide) towards the end of the rainy season, to be farmed in the dry season as the waters recede. The Senegal River Valley's age-old agricultural production systems are built upon that complementarity in space and time: rain-fed farming and grazing on *jeeri* highlands, are succeeded by flood-recession farming and grazing on low-lying *waalo* land. The total area of the alluvial plain has been estimated at 10,000 km<sup>2</sup>, and the area of flood-recession farming in an average year at 100,000 hectares for both banks of the river, 65,000 hectares for the Senegalese bank alone (ORSTOM-OMVS, 1980; IRD-OMVS, 1998). Downstream from the Middle Valley, in the Lower Valley and Delta, both rainfall and flood-recession farming diminished; upstream, in the Upper Valley, rain-fed farming was paramount.

After serving as an axis of French penetration, the Senegal River Valley became marginal to colonial preoccupations; its inhabitants retained their traditional farming systems, while increasingly resorting to labour migration, first to the groundnut-growing areas of Senegal, then to Dakar and France. Such few agricultural experiments as there were, took place in the largely unpopulated Delta; it was taken for granted that the inhabitants of the Valley would not wish to take part.

After World War Two, which had revealed the extent of Senegal's dependence on imported rice, irrigated rice was tried in the Delta in the 1950s; after independence, a newly formed State development corporation, the Société d'Exploitation des terres du Delta du fleuve Sénégal (SAED), undertook to revive highly mechanized irrigated rice-farming on a large scale, with about 20,000 farmers brought from the Valley and elsewhere to live in newly-built settlements. 30,000 hectares were to be brought under cultivation in ten years. But the scheme was not a success, farmers were underemployed and consumed much of their rice themselves, leaving too little to be sold to repay their debts to SAED. From the late 1960s on, farmers began leaving the area, and SAED suspended its plans for extending the scheme. It did not, however, suspend its plans for irrigated farming; on the contrary.

From the 1960s, both rainfall and flooding decreased considerably in the Valley, even disappearing some years. The drought, it must be said, offered new opportunities for development planners, allowing them to suggest with some plausibility that the farming and livestock-rearing systems by which the Valley's inhabitants lived, belonged to the past, and that the future lay with irrigated farming alone. In the early 1970s, two decisive events took place: SAED moved its operations upstream, and the Senegal River Development Organisation (Organisation pour la Mise en Valeur du Fleuve Sénégal - OMVS), whose member States were Senegal, Mali and Mauritania, came into being. These closely coordinated and mutually supportive operations - SAED described its role from the beginning as '*préparer l'après-barrages*' - must be understood together; thus the story of Manantali Dam begins fifteen years before the dam itself became operational. The story to be told here is that of the social impacts of the OMVS programme that led to the construction of Manantali (and its sister dam Diama), and of the irrigation schemes it inspired. It is told in order to review the social impacts of Manantali and recognize the key equity issues they raise, in the hope of learning from the way those issues were handled in the case of this one African dam, something of how they might be resolved throughout Africa today.

# 1. The 1970s: Dam Planning and the Rise of Irrigated Farming

## 1.1. The Future According to OMVS

Founded in 1972, OMVS succeeded the Senegal River States Organisation (Organisation des Etats Riverains du Sénégal - OERS), founded in 1968, which was dissolved after the withdrawal of the fourth member State, Guinea. Its purpose was to promote and coordinate development of the river basin in the three member States.

That same year, OMVS stated its objectives: to provide a better and more secure livelihood for the inhabitants of the River basin and surrounding areas; to safeguard the ecological balance of the River basin, and help create such balance in the Sahel zone; to make the economies of the three member States less vulnerable to climatic conditions and external factors; and to accelerate the economic development of member States by intensive promotion of regional co-operation.

In 1973 OMVS announced its programme, centred upon the construction of two dams: the main dam upstream, at Manantali in Mali, to store the waters of the Bafing, which contributes about 60% of the flow of the Senegal River, in a reservoir; and a secondary dam at Diama, at the mouth of the river, to stop salt water penetrating the Delta and the lower valley. The programme had three components. The first was irrigation. The second was navigation: the river was to be made navigable in all seasons, from Saint-Louis to Kayes. The third was energy, with the construction of a hydro-electric plant at the base of the Manantali dam.

How would irrigation contribute to fulfilling the stated objectives of OMVS? The twelve-volume *Senegal Basin Integrated Development Programme* (PNUD-OMVS, 1974) states at the outset that its chief purpose is 'to provide the people of the Senegal River Valley with an adequate basic diet and increased cash income, enabling them to progress beyond the hazardous subsistence economy in which they live, into a modern consumer economy'. It adds: 'However, in order to ensure an appropriate rate of self-financing for the programme, the system instituted must promote reinvestment of a substantial part of the balance.' This is restated in a later volume: 'The crops chosen must, while meeting as quickly as possible the food requirements of the people of the Valley, generate high cash flows leading to rapid progress towards the stage of economic « take-off ».' (PNUD-OMVS: I, 150; V, 25)

The aim was to bring 300,000 to 400,000 hectares of land under irrigation, with two crops a year. Between 1975 and 1983, the area of land under cultivation was to increase from 6,356 hectares in the rainy season and 3,250 in the dry season, to 72,841 and 56,776 hectares respectively; in other words, it was to increase fourteen-fold in the space of nine years, with 13,500 hectares being added on each year. The main crops would be rice and wheat; the area devoted to sorghum and maize would gradually decrease. For twenty years, Manantali's reservoir would be used to simulate the River's annual flood, at a rate of 2,500 cubic metres/second during thirty days in August and September, so that people could continue the traditional flood-recession farming, 'thus guaranteeing those who depend on that crop a relatively stable although modest income' (OMVS, 1979); but the level of flooding would decrease steadily every year: it was expected that after twenty years, the entire population of the Valley would be engaged in irrigated farming. A research project which produced a series of annotated maps of population distribution and participation in flood-recession farming in the Valley, while noting that 364,132 persons out of a total population of 592,602, were found to engage in flood-recession farming, added :

*The spread of hydro-agricultural schemes offers a new perspective for the region's development. The launching of a large dam construction programme makes this perspective irreversible, and means that large areas will have to be brought under irrigation, as the river's flood will be suppressed, or maintained at a very low level; consequently both the land and people involved in traditional agriculture will cease to be so in the near future. This is the context of our inventory of flood-recession land and farmers (Lericollais, 1980).*

It was estimated at the outset that the OMVS programme as a whole would take 40 years, with an overall budget of 800,000 million CFA Francs (\$3,200 million at a pre-devaluation rate, \$1 = 250 CFA), 280,000 million of which (\$1,120 million) would be earmarked for agriculture. At the end of the 'seventies, the cost of the Diama dam was estimated at 34,000 million CFA (\$136 million), and Manantali at 102,000 million CFA (\$408 million). At the beginning of the 1980s, funding for the first phase had been obtained: work could begin.

OMVS plans received a certain amount of attention in France. This was largely due to the presence in France of African migrant workers, a majority of whom were from the Senegal River Valley, and specifically to the success of one of their organizations, the Union Générale des Travailleurs Sénégalais en France (UGTSF), in raising awareness of conditions there. Many critics warned of the likely consequences of these plans, pointing out that they took no account of what River inhabitants might actually want or need, and that no alternatives had been considered:

*Once cut off from access to resources, village communities will disappear. The material basis of their structure will be destroyed. (Franco, 1975)*

*Not only is OMVS's programme not indispensable for ensuring food security in the region, but it is also, in many respects, the worst possible solution. (Bessis, 1981)*

*This project entails irreversible risks to production, peasant farmers' earnings, health, nutrition, environmental stability and traditional society as a whole. ('Open letter to Mr Abdou Diouf', 1982)*

*Obsessed with increasing yields per surface, the promoters of the OMVS project ignore question of returns on capital and on labour. However, village associations maintain that these returns are higher for local subsistence farming. (Comité Québec Afrique, 1981)*

*Once more, peasant farmers are being used as an alibi. In theory, all this is being done for their benefit. If one looks more closely, one notes that the dams have already benefitted:*

- *the consultancy firms that have already earned several thousand million francs in fees, and hope to earn much more;*
- *the bureaucracy of OMVS and its counterparts in each of the three member States. (Dumont, 1981)*

*Developing the resources of the Senegal River is an essential task for River people and for the riverine countries as a whole. However, if it were to be done according to current plans, it would be better for them that it not be done at all. (Adams, 1977)*

But they were scholars, NGO workers or journalists, not people in positions of power and influence; what they said was irrelevant. As for the inhabitants of the Valley, no one asked their opinion; it was assumed that they would be in agreement with OMVS plans.

## 1.2. 1972-1981: Was Village-Level Irrigation a Success?

From 1972, while attempting to consolidate activities in the Delta by improving irrigation systems and dividing large cooperatives into small *groupements producteurs*, SAED sought to extend its operation to the more densely populated areas upstream. Here, a larger proportion of the work would be done by the peasants already living in the area, trained through small-scale experimental plots, *petits périmètres villageois* (PIV), which would rapidly be expanded into *grands périmètres*.

In the Valley, upstream from Dagana, there had been no irrigated farmig, except for a few small pilot schemes and a FAO research station in Matam. But in 1973, SAED extended its operations to Nianga, in the Lower Valley: dikes were built around 10.000 hectares of flood-recession farmland, and 650 hectares were brought under irrigation. In 1974, an official decree made SAED responsible for the agricultural development of the Senegalese bank of the River, from Saint-Louis where its headquarters are, to the Mali border.

In 1975 SAED moved further upstream to Matam in the Middle Valley, where an expatriate SATEC agent, originally sent to the area to improve sorghum production, had just set up three small irrigated rice-growing perimeters, twenty-five hectares in all, involving about one hundred and fifty drought-stricken farmers; and to Bakel, where irrigated rice-growing was also introduced through an expatriate, a French agricultural technician who had come out to help locally organized farming groups improve food production. The Bakel groups, while interested in irrigation, wished to remain independent and to introduce irrigation slowly but were nevertheless brought under SAED control (Adams, 1977).

*Périmètres irrigués villageois* (PIV) developed rapidly in the Valley: on the Senegalese side, in 1974 they represented 20 hectares of irrigated land, in 1983 7,335 hectares, 29% of all land prepared for irrigation in the Valley and Delta (Mathieu, 1991), and in 1986 12,978 hectares; on the Mauritanian side, 510 hectares in 1975, 2,205 hectares in 1980, 13,929 hectares in 1988 (Seck, 1991). Yields were good. A success story, then? That was the feeling at the time. But it proved to be a fragile success, based on exceptional technical, economic and social circumstances.

First of all, the PIV developed during the years of drought which devastated rain-fed crops, greatly reduced the area of land available for flood-recession farming, and killed off much of the livestock and River fish. Irrigated farming was thus the only form of farming available. Also, pumps were provided free of charge, and inputs (fuel, fertilizer, seed) were heavily subsidized.

Secondly, the first irrigated perimeters were built on the river bank, near the water. The light alluvial soil was easy to work, and canals and dikes could to a large extent be built by the farmers themselves; also, as this was land used not for flood-recession but for rain-fed farming, it was not highly valued in the traditional land-tenure system, and the newly-formed farming groups usually had no difficulty gaining the right to use it. The land was shared out fairly equitably among group members, who were free to manage the perimeters in ways that suited their social organisation (Niassé, 1991).

(It should be noted, however, that SAED's policy was to distribute land to male heads of households, assuming that they would organize their household's labour as they saw fit; thus women did not gain access to irrigated land in their own right. The sole exception was in the Bakel area, a transition zone between the Middle and Upper Valley, where women successfully achieved that right, thanks to support from an independent peasant farmers' association, the Fédération des Paysans Organisés de Bakel (FPOB). It is true that in this area, unlike the Middle Valley, women have always been independent farmers. However, the opportunity cost of thus excluding women - leaving them dependent on 'women's groups' (*groupements féminins*) often manipulated by local politicians, growing vegetables on small plots of land equipped with a well - can perhaps be gauged by the fact that the FPOB women, twenty-five years on, constitute the mainstay of most village farming groups in the Bakel area, and have persisted with irrigated farming despite many difficulties.)



Thus the peasant farmers' priorities and those of SAED appeared compatible for a time. Both parties needed irrigation to make a living, and each made use of the other: the farmers produced rice on relatively easy terms (although they still incurred large debts, there was no great pressure to repay them), and SAED justified its existence, and the generous funding received, by fulfilling its goals in terms of perimeter construction and production levels. But this apparent harmony was based upon a fundamental misunderstanding. The peasant farmers wanted to feed their families; for a time, irrigation was a means to that end. If one takes it that each farmer had on average thirteen people to feed in his family, that means that in 1983, some 340,000 people benefited from irrigated food crops. But these crops were not sold; although in 1983 PIVs accounted for 29% of all land laid out for irrigation, they accounted for only 2.4% of rice sold to SAED (Mathieu, 1991).

Had it not been for OMVS and its plans, there might have been a small chance of PIV's success influencing River development plans in the direction of greater flexibility, which might have enabled it better to weather the storms of the 1980s. The Senegalese government's plans for irrigated farming, however, were designed from the outset to fit in with OMVS' programme of dam-building and large hydro-agricultural schemes; although food security for River people was a stated aim, the priority was national self-sufficiency in rice, which meant producing of large quantities of rice as a commercial crop. At the time, OMVS experts would sometimes say with a smile: 'One really shouldn't say so, but - let's hope it doesn't rain!' Indeed, if it were the case, as the experience of the 1970s seemed to show, that irrigated farming was the only hope for the River, OMVS' plans could readily be justified, and in turn provided a justification for SAED's introduction of economically unviable small-scale perimeters: these would provide the inhabitants of the Valley with technical skills they would later use on the vast irrigation schemes the State would put in after the dams were built. 'The future does not rest on the extended development of village units', wrote *Marchés tropicaux et méditerranéens* in 1981. 'They do not fit into the development scheme as conceived and planned by the three participating states.' (Mounier, 1984)

PIV were all very well as a transitional phase; but did not signify that the wishes of peasant farmers as producers and consumers would be taken into account if they conflicted with national priorities. This was particularly evident in the Bakel area, where irrigated farming had been introduced by a local farmer ahead of SAED's arrival, in the hope, precisely, of providing a more secure livelihood for the people of the area. Suggestions that it might be wiser to introduce irrigation gradually, integrating it with rain-fed and flood-recession farming, were rejected out of hand by SAED; when a village farming group began growing irrigated sorghum, SAED took their pump away (Adams, 1977).

River development schemes on the Mauritanian side offer an almost caricatural mirror image of the above; the equivalent of SAED being SONADER, the highly bureaucratic, Nouakchott-based State development corporation created in 1975, which however showed little of SAED's ambition and left the initiative to its various foreign donors. During the first eight years of its existence, SONADER spent seven and a half times as much on large irrigation schemes as on small perimeters, the latter, which helped villagers subsist during the drought, being left largely bereft of support in later years. Unlike Senegal, many large schemes displayed inegalitarian labour relations, with many sharecroppers. Worse conflicts, over land, lay in the future. In Mali, irrigation was confined to a few small village irrigated perimeters: 19 in 1986, 356 hectares in all; 7 of these were set up by village men working in France, with the help of NGOs, and the remainder by a State agency, OVSTN (Lavigne-Delville, 1991). (This paper will concentrate on the Senegalese part of the Valley.)

Pastoralists in the Valley, who had suffered even more from drought than farmers, did not benefit from the introduction of irrigation even to the limited extent that farmers did. The boreholes (*forages*) heralded as a great progress in the 1950s, had made them more vulnerable to drought by reducing their mobility; and in the 1970s, schemes such as SODESP and the *Projet de Développement de l'Élevage de Bakel*, based on sedentary rearing of animals for market, did not benefit them, because they disregarded the age-old system that had allowed them to survive, moving between the Valley

and the area to the southwest designated as a Forestry and Pastoral Zone (Zone Sylvo-Pastorale). The appearance of irrigated perimeters in the Delta, traditionally a grazing zone, and in the Valley, added to the effects of poor rainfall and flooding, tended to exclude pastoralists from access to the River; some families divided, with some members resigning themselves to irrigated farming and other staying in the near *jeeri*; others left the Valley altogether (Santoir, 1994).

### 1.3. Notes for a Different Future

From the beginning, four sets of protagonists were present: the bureaucracies of OMVS and its member States; the funding agencies; the inhabitants of the Senegal River Valley; and critics of dams. The bureaucracies of OMVS and its member States were to the fore as prospective dam-builders, strong with the support of the funding agencies. They were agreed on an ambitious, forward-looking programme; they were also agreed that the beneficiaries of this programme would be, first and foremost, the inhabitants of the Senegal River Valley.

This required from the outset a remarkable degree of obliviousness on their part to equity and distributional issues. For their programme was rife with contradictions. The River people were meant to be prime beneficiaries, yet it was not they, but city-dwellers, who were consumers of the wheat and rice which were to replace their staple crops, let alone of the electricity the dam was to produce. Would they even benefit as producers? It was tacitly acknowledged that 'traditional agriculture' played an important part in the domestic economy of the Valley, and could not be withdrawn straight away; yet it was taken entirely for granted that it had no future and must be replaced as quickly as possible with irrigation, which would feed the Valley people better. Of course, that could not be the only consideration; the programme would also have to generate a cash surplus for reinvestment. What part would a population increasingly made up of women, children and the elderly, as years of drought intensified the pace of labour migration to France, be able to play in this?

Critics of the OMVS programme pointed out these things, which were to emerge as the key equity issues raised by the OMVS programme and its keystone, Manantali Dam. OMVS and member-State spokespersons responded with indignation: obliviousness to equity and distributional issues became sheer denial of something else the dam critics pointed out: that whoever else might or might not lose out, they themselves were certain winners.

However, while it is noteworthy that this debate was happening at all, it had no bearing on the unfolding of events. Of course, the fourth protagonist of the story, the population of the Senegal River Valley, was quite unaware of it, isolated by distance, language barriers, poverty, and a certain amount of disinformation and intimidation by project staff and local administration. But it is far from certain that they would have heeded it in any case; because what was happening on the ground, with the spread of village-level irrigation, could be seen as hopeful at the time.

The story, however, has the earmarks of a tragedy in the making. One may recall the protagonists at the close of the first act: State bureaucracies triumphantly in the ascendant, with donors (and attendant companies) discreetly at their side; the people of the Valley a silent chorus; and dam critics, like Cassandra, warning in vain. In this decade of State corporations and 'integrated rural development', this was a drama that was being played out throughout Africa. Only the presence of dam critics is an unusual feature.

Bad practices on the part of donors evident at this stage, are neglect of all-too-predictable equity issues: the impact of flood suppression on the domestic economy of peasant farmers, and the related question of their ability to meet the demands in capital and labour of irrigated farming. Bad practices on the part of State and multi-State bureaucracies, include failure to consult or even inform the affected population about the implications of dam construction and the introduction of irrigated

farming, planning instead to present them with a *fait accompli*; and the refusal to listen to criticism. These bad practices can be seen as cancelling out the good practice of allowing farmers some latitude with the social organization of irrigation. Such instances of good practice as can be glimpsed during this period, lie in the fleeting attempts of small organizations of people to be affected by the dams, assisted by concerned intellectuals, to call into question the rationale of actions planned and being carried out.

## 2. The 1980s: Dams Up, Irrigation Down

### 2.1. 1981-1986: Adjustment Deferred

If the drought and the subsidies for irrigated farming had lasted, the illusion that the State and peasant farmers had the same objectives might have persisted. But the changes which occurred during the 1980s brought the underlying contradictions out into the open. As a result of the structural adjustment programmes undertaken by Senegal from 1980 on, the conditions of access to irrigated farming were to undergo a radical change.

In 1981 SAED, which at the time had a deficit of 2,706,000 million CFA Francs (\$10,824 million), was instructed to prepare to withdraw from all forms of direct involvement in production, such as providing fuel and fertilizer to be paid for after harvest and buying farmers' rice. A 1984 law provided a more flexible form of association for farmers than co-operatives or *groupements de producteurs*, the Groupement d'Intérêt Economique (GIE), giving them access to credit. Also in 1984 was created the National Agricultural Credit Bank of Senegal (Caisse Nationale de Crédit Agricole, CNCAS), which from 1987 would replace SAED as the source of credit for peasant farmers. Two key slogans of the New Agricultural Policy (Nouvelle Politique Agricole) propounded by the Government in 1984, were *responsabilisation des organisations paysannes* and *promotion du secteur privé*: the withdrawal of the State would both encourage peasant farmers' organisations to take on new responsibilities, and stimulate new activity in the private sector.

Things did not change all at once. Although no more large perimeters were built from 1982 on, PIVs continued to multiply, especially in the Middle Valley where about 10,000 million CFA Francs (\$40 million) had been spent by 1986. Every village where there was land available had several PIVs, sometimes as many as eight or ten; some 'second-generation perimeters' and larger 'intermediate perimeters' were built on flood-recession land. But the consequences of the new policy, compounding those of the old, became evident a few years after it was introduced. In the Valley, where the rise of the PIVs had taken place in the 1970s, these consequences would be felt more quickly and directly than in the Delta. But in both areas there would be heightened inequalities, with a vulnerable majority having to confront the rigours of liberalisation head-on, while a privileged minority used its privileges to take advantage of the new order of things - just as it had, more often than not, of the old. (It is useful in this context to distinguish between the Delta and the Valley. 'Delta' is here used to refer to the Dagana, including the Delta in the strict sense and the Lower Valley, coinciding on the Senegalese bank with the *département* of Dagana; 'Valley', as distinct from 'Delta', is used to refer to the area upstream from Dagana, coinciding with the *départements* of Podor, Matam and Bakel. In other contexts, 'Valley' may designate both together.)

In other circumstances, these new difficulties could have been an inducement to slow the pace at which land was being brought under irrigation, to associate irrigated farming with other less costly farming methods, and to try and recreate the complementarity between farming and herding. But that, as has already been noted, was out of the question. The dams were under construction: work on Diama began in 1981, and on Manantali in 1982. Between 1975 and 1988, the area brought under irrigation in the three OMVS member States expanded from 10,000 to 57,000 hectares, 66% of it in Senegal (Seck, 1991). There could be no turning back.

### 2.2. The Delta, 1987-1992: State Handovers and Private Schemes

By the end of the 1980s, two-thirds of all land brought under irrigation was located in the Delta, where there were both large publicly-funded irrigation schemes and a rapidly-expanding private sector. In this area, where there had been little farming, in particular flood-recession farming, before the advent of irrigation, irrigated farming is often the province of 'new farmers' with income from non-agricultural sources; it is highly mechanized, and most of the crop is grown for sale, accounting for four-fifths of all paddy sold to River rice-processing plants (Le Gal & Dia, 1991).

In the Delta, SAED committed itself to transferring to their users, organized in *Unions de GIE de Producteurs*, all irrigation schemes built or rehabilitated with public funds; from 1990 to 1996, 13,275 hectares were transferred in this way. Most of the producers' unions found it difficult to achieve the results they had hoped for. Rice production dropped. Farmers invoked technical difficulties: the depredations of birds in the dry season, and soil fatigue due to double cropping. The Unions also found it difficult to fund successive farming seasons through credit. Many of their members tried to minimize risks by farming other plots on private schemes, and by trying to earn money outside farming. This system was not conducive to amortization of equipment, or to the upkeep of irrigation networks once the schemes had been handed over.

As well as the transfer of irrigation schemes to farmers' organisations, there was a rush towards private-sector irrigated farming, with privately-funded and privately-managed schemes run by industrial concerns, organized farmers or non-farmers, and private individuals; in the Delta, such farming outstripped publicly-funded large irrigation schemes. Before 1987, there had been very little private irrigation had been authorized by SAED: in addition to land held by the Compagnie Sucrière Sénégalaise (the only large-scale private irrigation scheme), privately built and run irrigated perimeters amounted to less than 10,000 hectares. This category of perimeter developed rapidly after 1987 because of two events: one being the transfer of the *zone pionnière*, land placed under the control of SAED, to the *zone de terroir* controlled by locally-elected *conseils ruraux*, and the other being the establishment of the Caisse Nationale de Crédit Agricole du Sénégal (CNCAS) in Saint-Louis. Some of the most successful private schemes were initiated by former SAED cadres who benefited from their connections to gain access to land and financial support; even lower-echelon employees who lost their jobs, received generous financial support to help them embark on irrigated farming. Businessmen and politicians were also among the ranks of would-be entrepreneurs.

The overall increase in the area brought under irrigation between 1987 and 1992 was due to private-sector irrigation, as was the considerable increase in the volume of loans handled by CNCAS, but the drop in levels of loan repayment between 1990 and 1993 coincided with the difficulties experienced by private irrigation schemes, which led many private GIE in the Delta first to decrease the area cultivated, then to give up altogether. The recession which began in 1993-1994 was due to the crisis in loan repayments, and to the poor design and construction of most private irrigated perimeters, which had proliferated wildly (20,000 hectares from 1987 to 1992); in addition, the main irrigation and drainage canals should have been rebuilt to cope with the increased demand for water.

The stereotype, favoured by the administration, of the Delta as the province of forward-looking, educated 'new farmers', as opposed to the tradition-bound Valley, covers a harsher reality. The unregulated development of private-sector irrigation in the Delta has had dangerous consequences - lowered yields, pollution, salinization of badly-drained soils - which threaten the future of the area and those who would earn a living there. Redevelopment of Delta land will require a level of investment that its current users, whether labelled 'farmers' organisations' or 'private sector', seem unable to provide. The change of status of Delta land in 1987, from *zone pionnière* to *zone de terroirs*, which meant that land grants came under the authority of *conseils ruraux* instead of SAED, is an obstacle to outside investment in large-scale irrigation schemes; for how much longer?

### 2.3. Miscasting for the Entrepreneurial Role

Work on Manantali dam was completed in 1988; both dams, Manantali and Diama were inaugurated in 1992. Together they cost nearly 200,000 million CFA Francs (\$800 million). The productivist logic which from the outset inspired the introduction of irrigated farming in the Senegal River Valley, required that they be made profitable by rapidly bringing as much land as possible under irrigation, the ultimate goal proclaimed still being 375,000 hectares for the three member States, and 240,000 hectares for Senegal. But the problems already noted - decline of area farmed, accumulation of unpaid debts, ecological degradation of the Delta - persist and grow worse.

Under the conditions created by structural adjustment, maintaining a policy of rapid expanding areas of land brought under irrigation requires the presence of a private sector able to undertake what can no longer be done by the State, with entrepreneurs who can make cash crops profitable, provide the inputs they need, transform and market them after harvesting, and ensure the maintenance of irrigation networks and equipment. Clearly most present-day private-sector irrigation in the Delta does not satisfy these requirements; so outside investors are needed. But what investors? And to invest in what? A major difficulty in the Senegalese Government and OMVS' plans for *l'après-barrages*, was that irrigated rice was not proving economically viable. For internal political reasons, apart from anything else, the Government was unwilling to do anything about it. Increased costs implied an increase in the price of paddy, but this was never carried out. On May 1st, 1988, at a time of post-electoral tension in Dakar, President Abdou Diouf announced that the price of a kilo of rice in the shops would be cut from 160 to 130 Francs.

The only possibilities, if one excludes hidden subsidies from public funds, would seem to be either national investors able to mobilize capital, a low-cost labour force and political support, or - less likely - multinational agro-industries producing for export. One can consider it unlikely that such investors will achieve their production goals under economic conditions satisfactory to the Government. In any event, such developments would constitute a massive privatization of infrastructure provided by public funds, at the cost of considerable harm to the River's environmental and social equilibrium.

The example of existing agro-industries is not encouraging. The Compagnie Sucrière Sénégalaise (CSS), established in Richard-Toll in 1970, was given 7,300 hectares of land by the Government under highly favourable conditions, including 30,000 m<sup>3</sup> of water per hectare free of charge each year and monopoly of the market for sugar in Senegal. In spite of these advantages, CSS has already cost the Government vast sums, estimated at 14,600 million CFA Francs (\$584 million) in 1992, and the cost of a kilo of sugar in Senegal is much higher than the international market price. From the social point of view, the company's wages policy has caused unrest on several occasions, its 8000-odd temporary workers are a constant source of social tension, and chemical pollution in the Richard-Toll area has reached alarming levels. As for the tomato-processing industry, it has experienced great difficulties these past few years; the appropriate light soils exist only on the south-eastern fringe of the Delta, and 2,500 hectares will suffice to meet future demand.

The example of national investors in Mauritania does not give cause for optimism either. In 1983, the Mauritanian government adopted new lands laws eliminating traditional land tenure in order to promote private enterprise, in conformity with the wishes of donors upon whom it was wholly dependent. In the absence of foreign investors, the procedure for gaining title to land was modified by decree, to make it easier for members of the Beydan élite to set up irrigated rice-growing schemes. The movement began in downstream from Rosso. In two years, from 1986 to 1988, the area brought under irrigation by these 'private' entrepreneurs (Nouakchott businessmen, traders, military men making use of their position in the administration) grew from 3,000 hectares to 20,000. From 1988-1989, such 'private' schemes had proliferated upstream from Rosso. This rush for land provides

much of the context of the tragic events of 1989, when under the pretext of the new land laws, inhabitants of the right bank were urged to lay claim to land traditionally farmed by people living on the left (Senegalese) bank, and then found that they themselves were under attack, stripped of all rights and expelled from the country (Bâ, 1991).

## 2.4. The Valley, 1987-1992: Peasant Farmers Lose their Grip

By the end of the 1980s, less than a third of all land under irrigation was located in the Valley, which produced under 17,000 tons a year and imported quantities of rice. Most irrigated land in the Valley took the form of hastily-built, first-generation village irrigated perimeters. In the *département* of Matam, by 1989-1990 only 121 of 215 perimeters were still being farmed, even in part; all first-generation perimeters had been abandoned (Niasse, 1991). Even the second-generation perimeters, in the *départements* of Podor and Matam, seemed likely to pass into other hands if the farmers who had received plots of land there did not manage to find the means to cultivate them. Their only prospect would then be to sell their labour in the private sector. In the *département* of Bakel, a WARDA study of 823 hectares of village irrigated perimeters showed that 40% of the land was not farmed in 1988-1989.

We have seen what circumstances favoured the spread of irrigated farming from the mid-1970s. By the mid-1980s, these circumstances no longer prevailed. The consequences were particularly marked in the Valley, where the proliferation of village irrigated perimeters had seemed to herald a successful shift to irrigated farming. For one thing, until the mid-1980s irrigation was the only option available to farmers. Thereafter average rainfall increased, and from 1988 farmers were entitled to rely upon more regular flooding, as OMVS had stated that after the dams were built, it would guarantee an artificial flood for ten years, so as to allow time for irrigation to replace flood-recession farming. Furthermore, until the mid-1980s pumps were distributed free of charge, and SAED provided inputs and services on credit, at prices subsidized by as much as 50%, to be paid for after the harvest. From 1986 on, inputs were sold at their true price, and SAED no longer provided them on credit.

Finally, until to the mid-1980s, village irrigated perimeters could be built on light soil on the river-bank, at a relatively low cost and with much of the work being done by the farmers themselves. Thereafter, all such sites having been used, perimeters would have to be built on lower-lying land with heavier soil, therefore at greater expense; as this was generally floodland, highly valued in the traditional system of land tenure, there would be competition between irrigation and flood-recession farming. Intermediate-size perimeters were built on prime flood-recession land; these perimeters proved largely unsuccessful. (In one notorious case, an Italian-funded project built a dike which prevented flooding of several thousand hectares of land; in the end, the project came to a sudden end, as a result of the 'Clean Hands' investigations in Italy, and the land was never brought under irrigation.) Henceforth, irrigation would raise problems for social relations and access to land.

Peasant farmers coped with the changed circumstances, either by reducing expenditure, even at the costs of lower yields; or by emigrating in search of work, even though irrigated farming, with its heavy demands on labour, is not compatible with massive reliance on migrant earnings. Funding irrigation through another local activity, such as fishing or the sale of livestock, could not provide a long-term solution either. In some cases, farmers bought inputs with cash advances from wealthier people, and repaid these advances in kind after harvest, at less than the official price; a disguised form of share-cropping, which allowed outsiders to invest in irrigated farming without having been granted land. In the end, people sold their plots of land, or simply gave up irrigated farming.

Thus it was clear, by the end of the 1980s, that if poor peasant families were to remain dependent on irrigated farming for their livelihood, the only way for them to meet its cost, other than emigration which would deprive them of the manpower they need, would be paid work as agricultural labourers,

which would require the presence of a dynamic private sector. Hence the lack of farming opportunities other than irrigation, especially flood-recession farming, may in the long run cause independent peasant farmers to disappear; directly, by denying access to water, and therefore to land, to those without the means to irrigate, and indirectly, by making farmers dependent on jobs created by granting irrigable land to outsiders, thus making it increasingly difficult for local people to undertake irrigated farming in their own right.

Who would benefit from such exclusion? In the Valley, unlike the Delta, it is mostly local people who apply for land grants: traders, men working abroad, members of prominent families. They thus gain a legal title to part of their family's land holdings, using traditional rights in order to undertake commercial farming. The political power of land-owning families in the Valley is sufficiently strong to ensure that there is little chance of a land grant being made against the wishes of the traditional owner, who is generally able to defend his interests in the *conseil rural*, generally made up of local land-owners. Only part of the land granted in this way has ever been brought under irrigation, in the form of small 'private irrigated perimeters' (PIP as distinct from PIV) of five to fifteen hectares, farmed either by hired labour, or by lending it to someone else, or a combination of the two; either with the grantee's own capital, or with the help of his connections (such as irrigation networks built free of charge by SAED, or a free pump).

Diamas was completed in 1986, and Manantali in 1988; both dams were inaugurated in 1992. Thus they were built during a period when irrigated farming encountered increased difficulties: massive unpaid debts, an ecological disaster in the making in the Delta, irrigation schemes lying abandoned in the Valley. A few years later, as we shall see, it became evident that while the economic goals stated in the OMVS programme were far from being achieved, the social goals (a better and more secure livelihood for the inhabitants of the River basin) not only had not been achieved, but had in a sense deliberately been set aside. For during the dams' first years in operation, at a time when there was every reason to supply an artificial flood to ensure a certain degree of food security, OMVS broke its promise.

## 2.5. Flood Support: a Promise not Kept

In 1986, the year before Manantali became operational, there was a very good flood. In 1987 there was no flood at all, as the dam's reservoir was being filled. In 1988, there was a moderate but satisfactory artificial flood; the harvest would have been good, if it had not been attacked by locusts. But in 1989 OMVS inflicted heavy losses on farmers through a double-peaked flood. The initial natural flood, due to the unregulated tributaries of the River, receded fairly rapidly, and farmers had begun sowing flood-recession crops, when a second, artificial flood, released 'for technical reasons', drowned the seedlings in low-lying areas. Many farmers, for want of seed or labour, were unable to make a second sowing. (Horowitz & Salem-Murdock, 1993)

In 1990, although it was a drought year and most rain-fed crops in the Valley failed, OMVS decided not to release any water at all, in order to test the reservoir's storage capacity.

In 1991, the reservoir's storage capacity having been tested, one might have expected an artificial flood. In the Middle Valley, 1991 was a drought year; it would have been an excellent opportunity to demonstrate how the dam could be used to help River people. On September 1 and 2, a flood release of about 1000 m<sup>3</sup>/second was added to the natural flood of the unregulated tributaries; two days later, the River's rate of flow was about 2500 m<sup>3</sup>/second at Bakel, which is the minimum flow required in order to achieve a flood. If the release of 1000 m<sup>3</sup>/second had continued for another week or so, there would have been a good flood and a good flood-recession crop.

But OMVS was merely trying to maintain the reservoir at 206 metres above sea-level; once that level was reached, flood releases diminished, then stopped. The reservoir was then maintained at 207



metres, then at 208, almost the highest level possible. Even at that level, so much water was entering the reservoir that it was necessary to make periodical releases of 1000 and even 1500 m<sup>3</sup>/second. When the flow reached 2500 m<sup>3</sup>/second, part of the alluvial plain was flooded, and farmers sowed their crops once the flood had receded. A few weeks later, as in 1989, a second release from Manantali drowned most of the new seedlings.

In 1992, OMVS released enough water in September for the rate of flow at Bakel to reach between 1900 and 2400 m<sup>3</sup>/second, enough to flood the lowest-lying land, but not enough to ensure good *waalo* throughout the flood-plain. There had been poor rainfall in most of the Valley, and OMVS consultants themselves acknowledged that the flood releases had been less than what was required to ensure a 'useful flood'.

OMVS's lack of respect for its promise to maintain an artificial flood, is particularly striking as the Senegalese Government's position on this matter seems to have evolved somewhat during the same period. OMVS had always seen the artificial flood as a temporary measure, due to last only ten years. But as early as 1984, the then Minister of Planning of Senegal, Cheikh Hamidou Kane, suggested a more flexible position, according to which the flood would be maintained for as long as the entire population of the Valley which depended on flood-recession crops, did not have access to sufficient irrigated land to meet its needs. He also added that 'it may be necessary to maintain the artificial flood even longer, to the extent that its suppression may harm natural ecosystems and upset existing agro-pastoral systems.'

In 1987, a university-based research team from the US, the Institute for Development Anthropology, began a programme of research in Senegal, the Senegal River Basin Monitoring Activity (SRBMA), which allowed it to demonstrate, among other things, that flood-recession crops offer a better return on capital and labour than irrigated farming, while reducing risks to a minimum. Their high-quality work successfully defended the idea that a permanent artificial flood from Manantali, which would raise the river to the level achieved by a natural flood, was justified by the increased production, income and work it would provide, while also protecting the environment; and that contrary to what OMVS consultants had claimed, there was no incompatibility between controlled flood releases and the production of electricity. IDA's research would henceforth be an essential reference point for all discussions of the future of farming in the Valley, and indeed of the future of dams in Africa.

When IDA's results were presented at a seminar in Dakar, in November 1990, they were favourably received by the Government of Senegal, which had just drafted a Master Plan for the Left Bank (Plan Directeur de Développement Intégré de la Rive Gauche - PDRG) calling for a permanent artificial flood. However, the then High Commissioner of OMVS stated that IDA's research was an affront to the authority of OMVS, which alone was entitled to decide how to use the water in Manantali's reservoir. Indeed, IDA's hydrology expert was told by OMVS staff that it was 'dangerous' even to ask questions about the artificial flood, as that might give farmers the idea that they were entitled to it.

## 2.6. Notes for a Different Future

During the 1980s, the same four sets of protagonists were present: the bureaucracies of OMVS and its member States; the funding agencies; the inhabitants of the Senegal River Valley; and critics of dams. Contrary to what one might have expected from a decade of structural adjustment-inspired New Agricultural Policy, one of the tenets of which was 'rolling back the State', the State bureaucracies concerned with River development were still very much to the fore. For OMVS, this was natural as Manantali and Diama were under construction. And SAED was rescued by OMVS

from the fate of other State development corporations, although its sphere of action was reduced. True, its scope of action and budget were reduced, and it had to lay off staff. But the staff laid off did not suffer on the whole. A second tenet of the New Agricultural Policy was 'promoting the private sector'; redundant SAED staff were assisted to become 'new farmers' and entrepreneurs. SAED won out doubly: as an institution, and in the persons of individual cadres and other personnel. Other similar persons were promoted to fill the private sector, in the absence of a genuine entrepreneurial class.

Once more, there was outright denial of equity and distributional issues where the majority of the inhabitants of the Valley were concerned. Farmers on large SAED schemes in the Delta received a measure of institutional support, and they, like those who joined non-farmers in setting up small private irrigation schemes, might have recourse to non-farming sources of income. But peasant farmers in the Valley, who had been introduced to irrigated farming under highly subsidized conditions, received no assistance to prepare for the change. Whoever else might be entitled to join the 'private sector', it was not peasant farmers; whereas on other continents small farmers have been seen as the backbone of the economy, the farmers for whose success with PIV had won SAED so much credit, would have to sink or swim without State help. Predictably, despite their efforts, they slowly sank. Not only were the altered conditions of access to irrigated farming not acknowledged by SAED as an equity issue; in their time of greatest need, towards the end of the decade, when the full impact of the change had become apparent, OMVS deliberately denied the farmers of the Valley the promised flood support from Manantali. Presumably, funding for the rapid expansion of irrigation having become more problematic, OMVS feared creating a precedent that might endure.

This is all the more likely, as a new element intervened at this time: while SAED and OMVS were as one in their denial of the two paramount equity issues in River development, other elements within the Senegalese government were acknowledging that there was cause for concern. This idea was not confined to politicians from the Valley, but gained ground until it became part of official policy on River development with PDRG; during a period which coincided with the presence in Senegal of dam critics of a new kind: the SRBMA research team. And donors, it seemed, were no longer monolithic: SRBMA was funded by USAID which at the end of the 1980s withdrew its funding for SAED in the Bakel area. Yet, to anticipate, this apparent policy shift was not to be translated into action.

The bad practices in evidence during this period, are those already noted for the previous decade: denial of the social impact of donor, State and OMVS policies, now no longer a matter for speculation, but very much in evidence. The key equity issues, the conditions of access to irrigated farming and the question of the flood, are largely unacknowledged in principle and denied in practice: the State made no provision to soften the financial impact of structural adjustment measures on peasant farmers (whereas provision was made for redundant cadres), and OMVS did not respect its earlier commitment to providing flood support.

There are, it is true, countervailing good practices to be noted: on the donor side, funding for innovative research dealing with social impacts of Manantali; on the State side, willingness to revise policy to take some account of the issues underlined by that research; these can be linked to the constructive dam criticism of SRBMA. But these stood little chance of success, for they ran counter to the thrust of mainstream policies pressed by donors upon the State, as to the policy conducted by SAED and OMVS. The SRBMA team were mainly expatriates; after their departure, there was no source of support for a policy shift within civil society; no more dam critics, so to speak. And the inhabitants of the Valley, those most closely concerned by these developments, had very little access to information, whether on OMVS's earlier promises or subsequent developments (although on any of them (although a synthesis of SRBMA's final report was printed in Pulaar translation), and lacked any avenue for expressing their opinions.



### 3. The 1990s: All Dammed Up and No Place to Go

#### 3.1. Is There a Current Policy for River Agriculture?

Manantali and Diama had been in operation for several years before both dams were officially inaugurated in 1992. But to what end? The sole justification for their existence to date, was development of the River's agriculture. But by the time they were built, River development seemed to be at a dead end, having achieved neither its economic nor its social objectives.

The Plan Directeur de Développement Intégré de la Rive Gauche (PDRG), drafted in 1990 and adopted by the Government of Senegal in 1994, seemed in some measure to acknowledge this. The introduction offers a severe critique of the first twenty years of River development, and states that 'towards the end of the 1980s, so many failures and so many fears for the future led to a change of direction.' The text continues: 'There was a renewal of thinking about the aims of development, the idea of maximizing the area under irrigation being replaced by the idea of an integrated and harmonious form of development, achieving the best possible compromise between social goals (food self-sufficiency for the population), economic goals (a good return on invested capital) and ecological goals (restoring and protecting the environment).' And it concludes: 'It is precisely in this context that the 'Plan Directeur' approach was devised, in order to define a development strategy for the left bank for the next 25 years' (Republic of Senegal, 1994). The mixture as before, one might think; but on one subject at least, that of flood support, that strategy broke new ground.

True, PDRG still asserts that irrigated farming is the best way of achieving 'social' goals (food self-sufficiency and job creation), a view which seems quite out of touch with the situation prevailing at the time it was drafted. And out of five different 'scenarios' ranging from Z (maximum irrigation, maximum electricity, no flood support) to C (maximum flood support, minimal irrigation), 'after political arbitration by the Senegalese authorities, in concertation with the World Bank', it chose Scenario A, which involves the largest possible irrigated area compatible with other uses of the water (environment, flood-recession farming, hydro-electricity).

Nevertheless, this constitutes an explicit commitment, however prudent, to maintaining an artificial flood as a permanent feature of River development; and for the first time, defines a strategy which explicitly acknowledges flood-recession farming as an enduring component, however limited in scope, of agriculture in the Senegal River Valley. For Scenario A guarantees 33,000 hectares of flood-recession farming and 63,000 hectares of flood-recession pastures. The first two phases of PDRG would be equally compatible, it is said, with Scenario B1, which would guarantee 50,000 hectares of flood-recession. (The area flooded in an average year during 1946-1971 has been estimated at 312,000 hectares for both banks of the River, and the area of flood-recession farming at 108,000 hectares for both banks, 65,000 hectares for the Senegalese bank alone. The most extensive area of flood-recession farming in 1971-1979 was 62,200 hectares, and the least extensive 10,700 hectares (OMVS-IRD, 1999).

But the question arises immediately: what has become of this Plan Directeur? It seems to have vanished without a trace; as far as OMVS is concerned, it may as well never have existed. In 1994, after a good flood, farmers had begun to sow what would have been an extensive area of flood-recession crops, when a second flood, produced by emptying the Manantali reservoir, killed the first-sown crop and flooded flood-recession farmlands for several months, so that no crops at all could be grown that year. The exceptional flood of 1995 was just as fortuitous; it was due to a decision not to retain any water at all that year, in order to inspect the dam. The following year, there was no flood at all. IRD research, conducted by overflight in an aeroplane and identifying cultivated areas on maps

and aerial photographs, showed that in the *département* of Podor, the area of flood-recession farming in 1995-1996 was more than double the area reckoned by OMVS in 1970-1971; which shows how much the population values flood-recession farming, and how quickly they adapt to circumstances. (Le Roy, 1997).

According to SAED's own statistics, the total area laid out for irrigation on the Senegalese bank of the River, was 71,751 hectares in 1995; and the area actually farmed that year, in all seasons, was 29,792 hectares. (Some sources report a recent upturn of the area cultivated under irrigation; but it appears to be due to a moratorium on debts, which merely postpones the problem rather than resolving it.) Nevertheless, SAED is pursuing an ambitious programme of constructing and rehabilitating irrigation schemes, costing 178,000 million CFA Francs all told (\$356 million), part of which has already been funded. If SAED were working within the framework of PDRG, which recommends 88,000 hectares of irrigated land, ought it not at the very least to have suspended construction of new schemes? That seems very far from the thoughts of the Minister for Agriculture. Under the headline 'M. Robert Sagna notes that 30 thousand hectares are being farmed in the River Valley, out of a potential 240 thousand hectares', a Dakar newspaper notes: '« If peasant farmers aren't capable of cultivating those 240 thousand hectares, other people will have to be allowed to do so; and that implies solving the land tenure question » stated the Minister, who announced that a draft law will be put before the National Assembly within the next few months.' (Walfadjri, 11/12/98)

In 1995 the World Bank approved the Agricultural Sector Adjustment Programme (Programme d'Ajustement du Secteur Agricole - PASA) presented by the Government of Senegal, upon which the Agricultural Sector Investment Programme (Programme d'Investissement du Secteur Agricole - PISA) was based. Just as the programmes of SAED and OMVS did in their day, PASA states both economic and social goals: while aiming for an annual growth rate of 4%, it also states the intention of improving food security, rural incomes and natural resource management. But the proposed strategies - liberalization, diminishing the role of the State, land reform - do no more than replicate the New Agricultural Policy of the mid-1980s. The same remark applies to the agricultural projects and programmes outlined in PISA, clearly based on the idea that food security will be ensured by massive investment in irrigated rice-growing, and that 4% growth can be ensured by a considerable increase in paddy production, which is to be multiplied by four, or near enough, by the year 2000. Similarly, cash crops are relied upon to create jobs in rural areas. No new proposals are made for protecting the environment. Above all, as far as the Valley is concerned, there is no mention of PDRG, although it was adopted by the Government only a year earlier. It's as if one had moved twenty years back in time.

In fact, the Government's actions bear not a trace of any misgivings about the agricultural policy carried out in the Valley since Independence, based exclusively on irrigation. On the contrary, the Valley's future prospects are described in terms identical to those used in the 1970s. It would seem that PDRG, which at least accepted the idea of doubt, was an aberration. Thus the Minister for Agriculture announced in 1997: 'For us, irrigation is the only solution' (*Sud*, 17/11/97). SAED and the Ministry of Agriculture cling against all odds to their productivist goals, and continue to make new plans, for major irrigation infrastructure and for building new irrigated schemes or rehabilitating existing ones, some of which have already been funded.

In 1992, a group of farmers' and pastoralists' associations issued a manifesto which among other things asked the administrative authorities:

*in co-operation with peasant farmers' organizations, to regulate the artificial flood in such a way as to favour flood-recession farming and the reproduction of River fish;*

*in co-operation with peasant farmers' organizations, to evolve a land grant and development policy that gives priority, first to the present and future needs of River inhabitants, then to the*

*present and future needs of the inhabitants of the rest of Senegal, and which takes into account all possibilities for developing the land, not just irrigation.* (Adams & So, 1996)

They received no reply. In late 1997, the Groupe de Réflexion Stratégique (GRS) an independent think-tank attached (with World Bank funding) to the Ministry of Agriculture, convened a meeting well-attended by officialdom, in order to inform representatives of the inhabitants of the Valley of the conclusions of the GRS report on River agriculture and given them the opportunity to comment upon it. The comments of this same group of farmers' and pastoralists' associations focused, as one might have expected, on those issues that appear throughout as the main equity issues connected with the dams (see Annex 1). They were dismissed as hired agitators; the organizers of the seminar (including the author of the present paper) were attacked via the press by the Prime Minister and the Minister for Agriculture, and the GRS, headed by the highly-respected author and former Minister Cheikh Hamidou Kane, was dissolved shortly thereafter.

Thus, in spite of all the evidence to the contrary, the Government still refuses to acknowledge that its agricultural policy for the Valley is in deep trouble, let alone to amend it to take account of reality. There is no way forward. Could that be why, during the 1990s, at the approach of that year 2000 by which, it used to be said in the 1970s, the Valley was to be '*le grenier du Sénégal*', Senegal's granary, several projects were put forward which relegate agricultural development in the Valley to the background: the Canal du Cayor, the Vallées Fossiles, the Manantali Energy Project?

### 3.2. Canal du Cayor and Vallées Fossiles

The idea of the Cayor Canal Project was to use the Senegal River to meet Dakar's water requirements for the next 40 years, by means of a 240 kilometre-long open canal which would link the Lac de Guiers to the Cap Vert peninsula, while irrigating 8,500 hectares of farmland in the regions of Louga, Thiès, Diourbel and Dakar. The cost of the first stage of construction was estimated at 76,000 million CFA Francs (\$304 million), to which must be added 37,000 million CFA Francs (\$148 million) for the irrigation schemes.

This project, for which a complete technical and financial report was produced, now seems to have been set aside because of the negative response of funding agencies. If one compares it to the Manantali Energy Project, with its 1,400 kilometres of electricity lines and its overall cost of 223,000 million CFA Francs (\$446 million, at a post-devaluation rate of \$1 = 500 CFA), the main difference would seem to be that the Cayor Canal, which was to be built by the Senegalese Army's Corps of Engineers, offered no lucrative contracts for foreign firms.

The Fossil Valleys Revitalization Programme (Programme de Revitalisation des Vallées Fossiles - PRVF), drawn up by the Ministry of Hydraulics at a later date than PDRG, involves reviving 3,000 kilometres of dry river-beds, the Ferlo, Saloum, Sine, Baobolon, Car Car and Sandougou Valleys. This would be achieved by taking water from the Senegal River, by means of two structures located upstream from Matam and at Keur Momar Sarr; the latter sluice-gate has already been used, in 1994, to send water flowing through 150 kilometres of the lower Ferlo Valley. The idea of PRVF is to make better use of the water made available by the OMVS dams, by allowing central areas of Senegal to benefit from the excess water that flows out to sea while the Senegal River is in flood. It is meant to help revive of the Senegalese economy, through agriculture (including 75,000 hectares of irrigated land), animal husbandry, inland fisheries and forestry. Its cost has been estimated at 30,000 million CFA Francs (\$120 million).

The planned flow of water from the River would have to take place during the period when its level rises (August 15 to October 15), which it is difficult to imagine could suffice to bring the dry river-beds to life and irrigate 75,000 hectares, even if OMVS were to vouchsafe flood support from

Manantali, without depriving other users. For the water said to be 'wasted' is in fact necessary for the submersion of floodlands at the required level. PRVF asserts that Senegal's total use of water from the River is well under the quotas allocated it by OMVS, which it says amount to 6 thousand million cubic metres, whereas the major uses planned by Senegal (PDRG, Cayor Canal, Vallées Fossiles) amount to only 5,4 thousand million cubic metres a year in all. These calculations, which have yet to be substantiated, would seem in any case to have become redundant, as they do not take into account the Manantali Energy Project.

It seems that PRVF has been set aside because of objections from the Government of Mauritania. This may well be only a tactical withdrawal; the press has reported remarks by leading officials (made, it is true, during the run-up to an election) suggesting that the project will be revived. As far as the lower Ferlo Valley is concerned, a model farm has been set up there, discussions are continuing with prospective investors, and the Ministry of Hydraulics announced at the end of 1998 that the report evaluating the project's impact on water use had been finalized and would shortly be submitted to the heads of OMVS member States. However, PRVF seems unlikely to survive the latest-born scheme of the 1990s: the Manantali Energy Project. One can imagine that for decision-makers, giving up the prospect of flood recession farming in the Valley is one thing, while giving up the prospect of more and cheaper electricity for Dakar, Nouakchott and Bamako is another.

### 3.3. The Manantali Energy Project

The energy component of the OMVS programme existed on paper since 1977, but had not yet been implemented for want of funds. However, in June 1997 the World Bank approved a loan of \$38 million to help install and operate hydro-electric turbines at Manantali dam. Diama and Manantali together cost nearly 200,000 million CFA Francs (\$800 million) to build; the Energy Project will cost 223,000 million CFA Francs (\$446 million, post-devaluation), 18,700 million of which (\$37,4 million) will be paid by the governments of the three OMVS member States. Of the remaining 205,000 million (\$410 million), 136,000 million (\$272 million) will be provided as loans, and 67,300 million (\$134,6 million) as grants. The main donors, apart from the World Bank, are France, Germany and the European Union.

The project involves installing at Manantali a hydro-electric plant of a capacity of 200 megawatts (MW), capable of supplying about 800 gigawatt-hours/year (Gwh) in a year of average water flow. In the initial version of the project, this electricity was intended for Mali, where it would help develop the mining industry; at present, Manantali's electricity is intended above all to supply Dakar, Nouakchott and Bamako. It will be conveyed by a network of over 1,400 kilometres of lines, which alone will cost 114,000 million CFA Francs (\$228 million): a 326-kilometre eastward line, Manantali-Kita-Bamako, and an 821-kilometre westward line, Manantali-Kayes-Matam-Dagana-Sakal, with branches from Matam to Kaédi (87 kilometres) and from Dagana to Rosso to Nouakchott (226 kilometres), which will join the present Sakal-Tobène line supplying Dakar.

According to the World Bank, the aims of the project are the following: to reduce the cost of electricity in the three countries; to contribute to repayment of the debt incurred to build Manantali; to make the electricity grids of the three countries more reliable and efficient; to encourage private sector participation in making use of this project and other future projects in the Valley; to set up an efficient organization for building and operating the project's infrastructure, and for mitigating the negative effects of the project and of Manantali dam on health and the environment; and to assist the traditional farming sector downstream by rational management of the Manantali reservoir (World Bank, 1997).

As far as *reducing the cost of electricity and increasing the grid's efficiency* are concerned, energy from Manantali (52% of which will go to Mali, 33% to Senegal and 15% to Mauritania) will reduce

the cost of electricity to the Senegalese consumer by only 8%, and will supply only 15% of the needs of the national company SENELEC, whose present capacity is 330 MW; it will defer by only three years the need for new investment. Furthermore, the forecasts of electricity production used to calculate return on investment are based on hydrological data for 1950-1994; if they were based on data for 1974-94, a period of low water flow more akin to present circumstances, estimated production would have dropped from 804 to 547 Gwh; and the OMVS States' savings on energy through Manantali would have dropped from 22% to 17%. One wishes that the Government had thoroughly investigated all possible alternatives: natural gas at Diannadio, the Gambia River's hydro-electric resources, lowering the cost of fuel by doing away with State subsidies to the local refinery (Société Africaine de Raffinage), before committing itself to a course of action the direct (and, as we shall see, indirect) costs of which are very high, while its profitability is more uncertain than has been stated.

As far as *contributing to debt repayment* is concerned, about 65% of funding for the dams was in the shape of loans, and debt servicing in 1996 amounted to about 12,000 million CFA Francs (\$24 million). The Manantali Energy Management Company (Société de Gestion de l'Energie de Manantali - SOGEM), to which OMVS has had to delegate its responsibilities in this field, is meant to pay 43,8% of debt servicing out of its income, the remainder being paid for by irrigation (and river navigation if it ever becomes a reality). However, loans to fund the Energy Project will greatly increase the debt; from 47,400 million CFA Francs (\$94,8 million) in 1997, to 184,600 million CFA Francs (\$369,2 million) in 2001.

*Private sector participation in making use of the project* seems amply provided for. Even without taking into account all the research conducted over the past twenty-five years, or the lucrative contracts - engineering, electro-mechanical equipment, etc - awarded to European companies, the national electricity company of Senegal, SENELEC, has been privatized, the main buyer being Hydro-Quebec; above all, the production of electricity at Manantali is to be entrusted to a private operator. For as far as *setting up an efficient organization* is concerned, the World Bank not only created SOGEM, but also stipulated that SOGEM would hire a private operator, designated as the 'Manantali Exploitation Company' (Société d'Exploitation de Manantali - SEM), to manage electricity production, and by extension the day-to-day operation of the dam, on the basis of a renewable fifteen-year contract. SENELEC and the other national electricity companies will pay SEM, which after taking its cut will hand over the remainder to SOGEM.

The role of the OMVS High Commission will be limited to following up decisions taken concerning water management, mitigation of effects on health and the environment, and so on. A Plan for Mitigating and Monitoring Impacts on the Environment (Plan d'Atténuation et de suivi des Impacts sur l'Environnement - PASIE) has been produced, as required by the project's donors: it includes a programme for mitigation of the impact of the Energy Project, which deals with the installation of electricity lines; a programme on environmental health, mainly on combating bilharzia and malaria; some 'accompanying measures' (rural electrification, and 'micro-projects for income generation and combating poverty, especially among women'). It also includes a programme for optimizing management of the Manantali reservoir, entrusted to IRD, to we will return. The total budget for PASIE is \$17,420,000, or 3% of the total cost of the Energy Project, estimated by the World Bank at \$445 million (OMVS, 1999).

IRD's research is the only sign of the World Bank's interest in the last aim cited: *assisting the downstream traditional farming sector*. No doubt one should be pleased to find, alongside economic aims (here centred upon electricity production), yet another aim that can be construed as 'social' (in addition to health and the environment), or rather, to use the Bank's terminology, as part of 'the struggle against poverty'. We are told that the Manantali reservoir will be managed as a 'multi-use' reservoir, and that the artificial flood should revive the floodplain's traditional functions. But doubt



quickly seeps in: is it really likely, in view of its past record, that just at the time when Manantali is due to provide electricity for the cities and generate revenue for OMVS, OMVS will begin to use it for the benefit of flood-recession farming and grazing? It would have been possible, at any time in the past ten years, to revive the floodplain's traditional functions; yet this was never done. The notion that installing hydro-electric turbines at Manantali is a useful step towards righting that wrong, is a curious one.

Is it even acknowledged that a wrong has been done? The final version of PASIE states that 'after Diama and Manantali dams became operational, major benefits were noted as regards irrigated farming, permanent availability of water for people and livestock, flood support, people returning to the area, reappearance of wildlife and regeneration of plant cover' (OMVS, 1999: 2) An African Development Bank report on the completion of Manantali goes further:

*The Senegal River Basin development strategy aims to establish a balance between man and his environment. (...) A vast campaign for the occupation of agricultural lands is underway on both sides of the river.... The significant results of the farming activity in this region which was formerly unsuitable for agriculture are drawing new populations.(...) With regard to public health, a marked improvement has been observed in the health of the people living in the Valley. (...) The results obtained at this stage are impressive: (they include) the supply of an annual artificial flood in August-September for a month.... Food production, especially cereal production, has achieved only average results under rainfed farming (sic). Fodder production, which was one of the expected benefits, is gradually developing. Livestock transhumance is now reduced. Livestock disposes of food in the outskirts of the river and can furnish organic manure for agriculture. (African Development Bank, 1994: 8,25, 36, 39).*

This contrasts sharply with a 1997 report on the Energy Project:

*The project provides occasion for correcting the negative impact which the Manantali and Diama dams have had on the basin's sensitive ecosystems, traditional flood-recession crops, river fishing and the population's health. The Manantali and Diama dams were built with a view to optimizing water resource management and meeting the water needs in a balanced manner. The absence, so far, of reliable water management instruments has not permitted the attainment of this objective. (...)*

*The absence of or the low flood level induced by the retention of Bafing waters by the dam, seriously disturbed the basin's ecosystems and disorganized its traditional economic activities, as a result of which the region became the poorest in all three countries. The appearance and increase of social disparities and malnutrition led to the massive exodus of labour force from the basin. Moreover, the development of irrigated agriculture and the absence of salt encroachment on the delta following the commissioning of the Diama dam resulted in the proliferation of habitats of endemic diseases, e.g. bilharzia. There has also been an increase in malaria cases and the appearance of new resistant strains. (African Development Fund, 1997: 36)*

Could it be that the supposed benefits of the Energy Projects for traditional agriculture are being emphasized now, so as to lull people's fears until it is too late to protest? We will return to IRD's research on optimizing reservoir management, which has the merit of making fairly clear just what is possible in terms of support for the flood, in conjunction with the production of electricity. Let us simply note here that it betokens a step backward from PDRG: there is less land available for flood-recession farming, and no specific provision is made for regenerating flood-recession pasture-land, the subterranean water level, forestry resources, nor the spawning zones for fish which were destroyed by the dam.

In theory a water management plan, reconciling the three main uses of the dam (water for irrigation, production of electricity, and flood support in favour of flood-recession farming), is to be drawn up under the supervision of SOGEM before the recruitment of a private operator to manage SEM, as it is to provide the basis for a reservoir management manual to be given to prospective candidates, as well as a water users' charter to be signed by the three OMVS member States. In fact, it is highly likely that priority will be given to electricity production, which in periods of low water flow is in direct competition with flood releases. As far as one knows, the water management plan does not yet exist, whereas nothing has been left to chance as far as electricity production is concerned.

Will OMVS and its donors really wait until this plan has been drawn up, before embarking on the sequence of events preparing for turbine installation? It seems that work has already begun; companies due to work on the eastbound line are already on site, and calls for tenders for the westbound line have appeared in the press. Without a water management plan designed to take all water users' needs into account, with precise and binding specifications, the peasant farmers of the Senegal River Valley will once more be the losers, and this time for keeps. Once management of the dam has been transferred by SOGEM to a private operator, with a contract guaranteeing a certain level of electricity production and penalizing the member States if that level is not maintained, it will be impossible to seek changes in dam management.

High-ranking officials at OMVS appear oblivious of the problem. 'With Manantali, we have to reconcile the irreconcilable', acknowledges Moustapha Ould Abeïdarrahmane, Director-General of SOGEM.

*That is to say, we have to ensure a constant production of electricity, and at the same time supply the Valley's farmers with water. To do so, we must make the transition from traditional agriculture to irrigated farms, especially as the region's food security is at stake. Nearly 350.000 hectares are potentially irrigable, which would allow peasant farmers to harvest two crops a year instead of one. Both from the energetic and the agricultural point of view, the dam offers magnificent economic opportunities.'* (Jeune Afrique, 11-17 November 1997)

### 3.4. Flood Support: What Can Be Done?

Maintaining an artificial flood remains an officially stated objective. In 1996, the Institut de Recherche pour le Développement (IRD, formerly ORSTOM) was entrusted by OMVS with the task of conducting research on the optimization of reservoir management.

Manantali Dam is built on the Bafing, the main affluent of the Senegal River, which is responsible for over half the flow measured at Bakel; the two other major affluents, the Bakoye and the Falémé, are unregulated. The artificial flood thus has two components: the natural flow of the Bakoye and Falémé, and an additional release of water from the Manantali reservoir. In practice, the artificial flood is the result of releases from Manantali, calibrated on the basis of the rate of flow of the unregulated affluents, in such a way as to achieve the desired rate of flow at Bakel. Its volume will increase if the rate of flow of the Bakoye and Falémé is weak. Ever since Manantali became operational, the River's rate of flow has been weak or average, so that releases from Manantali have been the essential component of the flood.

At the outset of research, digital simulation of dam management, based on data available for 1950-1993 on the River's natural rate of flow, showed how the dam would have functioned had it been in existence since 1950. The chosen hydrogram for the flood, almost identical in volume with that used for PDRG's projections, was defined as follows: 0 m<sup>3</sup> of water per second at Bakel on day 0, 2500 m<sup>3</sup> per second on day 6, 2500 m<sup>3</sup> per second on day 11, 0 m<sup>3</sup> per second on day 55. Three possible management scenarios were considered:

1. priority to the needs of agriculture (both irrigated and flood-recession),
2. priority to the production of electricity and the needs of irrigation (no flood support),
3. taking into account all three of the major uses of the dam (water for irrigation, production of electricity, and flood support for flood-recession farming).

Comparison involved the quantity of electrical energy produced, and the area available for flood-recession farming. ‘These are’, as IRD points out, ‘the two aims which compete most strongly against each other in the context of the weak rate of flow that has prevailed for the past 25 years in the Senegal River Basin. Providing water for irrigation poses no problem, as it can be ensured on a permanent basis at little cost to the production of electricity.

On the basis of natural rates of flow for 1970-1993, which correspond more closely to present-day reality, the third type of management considered would yield the following results (juxtaposed, for the sake of comparison, with the results of the River’s unregulated natural flow):

<i>Multi-use dam management</i>	<i>Unregulated river</i>
50,000 hectares of flood-recession crops one year out of 10, 40,000 hectares one year out of two	50,000 hectares of flood-recession crops one year out of three
Yearly average of 30,000 hectares during the period under consideration.	Yearly average of 57,000 hectares
No flood-recession crops at all one year out of three	Fewer years when flood-recession farming is possible

Scenario 2 would allow no flood-recession crops at all. As far as electricity production is concerned, of course it is Scenario 2 which gives the best results. But Scenario 1 yields results very close to 3, because when the river’s rate of flow is weak (as during the period under consideration), there are few releases which cannot be used for energy production. The same rules of management would apply for Scenarios 1 and 3, except that for 3 two extra clauses are added: preservation of the level of Manantali reservoir (when the level is less than or equal to 195 metres, releases are limited in accordance with established priorities), and electricity production (release of a flow making it possible to produce either 90 MW if the reservoir’s level is higher than 182 metres, or the maximum that can be produced if the level is higher than the dam’s overflow level).

In 1997 IRD released an artificial flood close to the hydrogram used as a standard. According to a rapid survey of SAED agents and people living near major areas of flood-recession land, this flood was generally perceived as satisfactory with respect to areas flooded; in the Matam area, however, it was sometimes judged not to have lasted long enough for satisfactory flooding of low-lying land. Although much better than in 1996, when there was scarcely any flooding, it was, however, distinctly inferior to that of 1995. Satellite images made it possible to evaluate the total area flooded. ‘With artificial flood support (taking 1997-1998 as representative) it can be estimated that the area available for flood-recession farming is of the order of 70,000 hectares, 45,000 hectares on the left bank and 25,000 hectares on the right bank.’ (IRD-OMVS, 1999)

It must be noted, however, that contrary to what is stipulated in the terms of reference, it was not found possible to install before the 1997 flood a system making it possible to predict rates of flow in the upper basin (Bakoye and Falémé) ten days in advance. It was therefore not possible to carry out moveable-date flood support, whereas, as the IRD report acknowledges, such a system ‘produces more electricity than flood support at a fixed date. Moreover, it produces more frequent « proper » floods than the unregulated river.’

One can say, nevertheless, that from 1998 on, provided the deficiencies of the 1997 flood are corrected, OMVS should have at its disposal the technical conditions required for flood support from Manantali. The final phase of IRD’s study involves producing a handbook on dam management.’The

rules to be applied will follow the aims stated in the optimum scenario. All cases will be envisaged, in order to establish orders of priority in the event of chronic deficits or of conflict between different water uses.'

There remains an essential problem, which goes beyond technical considerations. In order for flood support to be carried out according to the stated criteria, it will not suffice for the technical conditions to be met (which, as we have seen, is not yet the case); there must also be the political will to provide such support, and the private operator entrusted with management of Manantali must have received explicit and binding instructions to that effect. As IRD notes at the conclusion of its summing-up report after stressing that 'the artificial flood constitutes a vital issue in environmental, human and economic terms', 'there remains pervading uncertainty about the will of the associated countries to maintain this artificial flood over the long term.' This seems to be confirmed by OMVS's apparent decision to go ahead with the navigation component of its programme, which will require a year-round level in excess of that required by irrigation.

### 3.5. Notes for a Different Future

During the 1990s, there was little change in the practices of State and multi-State dam-connected bureaucracies. SAED's reason for existence was irrigation; during the 1990s, its refusal to acknowledge the grave difficulties facing irrigation in the Delta and Valley, led it to an increasingly defensive stance, and an ever more marked denial of what remained the key equity issues in River development; a denial, not only of the damaging social impact of dams, but of reality itself, as evidenced by recourse to the incantatory figure of 240,000 hectares to be irrigated by Senegal, and statements proclaiming that if peasant farmers won't farm them, 'others must be allowed to do so'. The victory against PDRG, which was in principle a victory against checking the growth of irrigation, may however have been something of a Pyrrhic victory, unable to change the circumstances which in reality checked its growth, prompting a shift of interest to other things. OMVS remained in the ascendant; the decision by the World Bank to fund the Manantali energy project was a victory in itself. But it was a victory that left OMVS with less real power than before; deprived, for instance, of control over the production of electricity at Manantali, and left with supervision of PASIE, which required some acknowledgment of the existence of social impacts of dams. Thus in both cases, denial of social impacts may have deprived both bureaucracies of some of the justification for their existence.

As during the previous decade, donors remained caught in the contradiction between sporadic gestures towards good practice on equity issues, and mainstream policies which cancelled out such gestures.. Thus, having contributed to the disappearance of PDRG in favour of PASA and PISA, and having failed to support the GRS, whose report on the Valley came out in favour of flood support, the World Bank somehow emerged as the prime defender of flood support and 'traditional agriculture'. Its internal reports, and those of the African Development Bank, contradict themselves and each other, and show them to be uncertain how to describe the social impact of the dams had been; favourable or unfavourable? This would tend to confirm the suspicion that the few paragraphs devoted to mitigation of that impact are chiefly for external consumption. The IRD study on optimizing reservoir management does not discuss any of the justifications for flood support; merely outlines what is technically feasible.

Donors and bureaucracies, then, in their usual place. But where were the dam critics? and where the inhabitants of the Valley? As has already been said, the position so ably defended by SRBMA has not been taken up publicly by home-grown dam critics. As for the inhabitants of the Valley, laws enacted in the 1990s which in theory promote decentralization and local democracy, in fact provide no institutional framework which would allow citizens to take part in decisions concerning them. If the culture of deference were not obstacle enough in itself, a further obstacle is the exclusion from the

political landscape of the village, the setting where issues concerning access to land and water are experienced by peasant farmers; yet another is that local elections are under the control of urban-based political parties.

The minor episode of the GRS seminar is instructive here, illustrating both embryonic good practice and full-blown bad practice. For the space of a few hours, as the result of an unexpected initiative by one of their number, a captive audience of State bureaucrats listened. to the two lesser protagonists of our story, dam critics and Valley people. The outcome was a strikingly clear illustration of what has brought River development to its present impasse: polite approval from, by and large, the constituency for PDRG; and from the dam-connected bureaucracy, SAED and its parent ministry, a vehement rejection of what had been said, not by engaging with its substance, but by impugning the motives and integrity of those who had spoken. It was both an opportunity sadly missed, and, because it was widely reported and discussed, a pointer to a different future.

## 4. Towards a Different Future

### 4.1. Assessing the Damage

According to the rhetoric that launched SAED and OMVS, Manantali was intended first and foremost to benefit the inhabitants of the River. But in fact, no consideration was given to the ways in which most River people actually lived: peasant family farming, herding, fishing. They were seen as part of the problem. As a result, as we have seen, Manantali has done them enduring harm; both directly, through suppression of the River's annual flood, and indirectly through the imposition of a form of irrigated farming ill-suited to their needs and means; while benefiting others.

If the losers from Manantali were its intended beneficiaries, the winners were those whose work it was: the donors (and the consultancies and construction companies employed), the government of Senegal and those of the other member States, which gained a purpose which stood it in good stead for the best part of twenty-five years, and, primarily, the bureaucracies of OMVS and SAED. During the period of dam planning and the spread of irrigation in the 1970s, they benefited directly from funding to create or expand their institutional base; thanks to its dam-prompted move upstream, SAED snatched seeming victory in the Valley from the previous decade's defeat in the Delta. During the 1980s, SAED as an institution was rescued, once more, by OMVS. Completion of the dams at Manantali and Diama was dramatic proof that the OMVS programme was on track; thus SAED remained a key player, still able to wield power and command resources.

Those who benefited from the consequences of structural readjustment during the 1980s were often those who had the means to take part in the rise of the 'private sector', generally derived from their privileged position in the State system. SAED cadres and other employees experiencing redundancy and early retirement were often able to use their connections, insider knowledge and special subsidies to re-emerge as Delta entrepreneurs: as 'new farmers' with generous holdings of irrigated land, or heads of businesses supplying Delta farmers with inputs and services or processing their harvests; their success was seen as vindicating the government's River development policy. Others who were encouraged to become 'new farmers', were politicians, redundant civil servants, unemployed degree-holders. The smaller private irrigators were perhaps the more genuine entrepreneurs (or speculators), but probably contributed disproportionately to the Delta's ecological disasters and insolvencies. In the Valley, those who set up small private irrigation schemes were most often members of traditional land-owning families and supporters of the ruling party.

If bureaucracy and some of its individual members could be said to have won twice over, the majority of the inhabitants of the flood-plain, peasant farmers and herders and fishermen must be termed double losers. During the 1970s, irrigation provided many peasant farmers (but few women, save in communities where they were already farmers in their own right), of the Valley with a means of subsistence during drought years, and the chance to acquire new skills. But the changed conditions imposed by structural adjustment during the 1980s, for which they were not prepared, drew them into a downward spiral of debt. As they lost their grip on irrigated farming, renewed access to flood-recession farming would have helped. From 1988, with the completion of Manantali dam, the promised flood support would have been possible, and would have cost OMVS nothing; but this support was denied them. On the contrary, the dam further reduced the flood, and ill-timed releases often destroyed much of such crops as had been sown. Many were left with no recourse but to work for other people, often outsiders, who could afford to advance the cost of inputs, in a form of sharecropping; or, in the end, to sell their plots of irrigable land (although this was in principle not allowed). That left the perennial recourse of labour migration, which further accelerated the decline

of irrigated farming. Rumours of dam-driven pressure to change the laws on land tenure, added to the prevailing insecurity.

Inhabitants of the right bank, of course, lost out tragically, forced to seek refuge in Senegal as the result of a conflict triggered by dam-induced pressure on land; as did, although to a lesser extent, those inhabitants of the left bank who had rights to flood-recession land on the other side. As for pastoralists in the Delta and Valley, the upheaval of their way of life through drought was perpetuated by flood suppression. Those who resigned themselves to irrigated farming suffered the same difficulties as other farmers. Those who weathered it best may have been those who withdrew from the River. although in latter years some Delta herders have begun to use crop residues as fodder.

Peasant farmers from the Valley lost out further as migrant workers: their families were increasingly dependent on them for subsistence, much as they had been in the drought years, and the decline of irrigation removed any prospect of investing any savings in farming or related activities. In many households women were left to care for children and the elderly, and to cope with such farming as they could manage. Women of child-bearing age and their children suffered most from hunger and malnutrition, and from the diseases made more virulent by dam construction and irrigation, bilharzia and malaria. By the end of the 1980s, the two main equity issues were clearly visible: flood support for floodplain communities, and the conditions of access to irrigated farming

Some of the more market-oriented farmers of the Delta also suffered from the pressure to 'make the dams pay'. The producers' unions to whom were abruptly transferred large State irrigation schemes, strove to help their members adjust to the changed climate; but that same climate worked against them. And those who formed individual *groupements d'intérêt économique*, caught up in the rush to swell the ranks of the 'private sector', found themselves trapped in debt at the same time as the environmental degradation caused by hastily-built irrigation schemes began to take its toll. There are, as we have seen, successful 'new farmers' in the Delta; but many Delta farmers and their families, not to mention agricultural labourers, suffer poverty and insecurity akin to that to be found in the Valley.

Suggestions that the inhabitants of the Valley as a whole have prospered at the expense of less favoured areas, are thus sadly wide of the mark. But it is true that other areas of Senegal have also suffered from the heavy emphasis on irrigation; those of the groundnut basin, for instance, have been left, on the whole, to wait for the Vallées Fossiles project, or the Canal du Cayor, to bring irrigation to them. There is no industry that one knows of, ready to be launched in areas to be newly electrified from Manantali; and as we have seen, any gain to city-dwellers from cheaper electricity from Manantali seems uncertain and fleeting, not enough by any reckoning to compensate further harm done to the Valley.

Indeed, one could say that the Senegalese nation as a whole has suffered from the government's failure to rethink its agricultural policy for the Valley, instead preferring corporatist interests (SAED, 'new farmers') to the common good. in what amounts to an abdication of sovereignty. OMVS itself has lost credibility, and stands to lose more in future, by being dispossessed of control over what may become the dam's sole justification, electricity production, in favour of private operators. Its member States will have added substantially to the burden of debt for dam construction, for a project that seems likely to destroy once and for all any hope of redeeming the harm the dam has done. Like all participants in mainstream development aid, donors funding Senegal River development claim to have social as well as economic goals. On the whole, they seem to have achieved neither.

## 4.2. Manantali as an African Dam

By this assessment, considered in conjunction with other dams covered in the literature, Manantali shows itself to be a very African dam. What is an African dam, then?

- It is a dam which harms the livelihoods of river-dwellers; most African rivers have floodplains, and losing the annual flood below the dam is a disaster for traditional floodplain farming, fishing and grazing.
- It is a dam which yields few compensatory benefits to peasant farmers; smallholders on irrigation schemes often find themselves unable to afford the extra costs of irrigated farming, and rent out or sell their land
- It is a dam whose short-term gains to the national economy, through commercial farming of import-substitution crops or the production of electricity for industrial purposes, are elusive for want of a substantial entrepreneurial class
- It is a dam built in countries where the institutions of civil society are weak, with no strong tradition of farmers' organizations or non-violent protest
- It is a dam the only clear benefit of which, paid for dearly, is to shore up State prestige, so that dam critics in Africa do well to learn a verse from the *Rubaiyat of Omar Khayyam*: 'When the King says it is midnight at noon, the wise man says behold the moon.' (McCully, 1996: 238)

An African dam is a dam like Bakolori on the Sokoto River in northwest Nigeria, where 22,000 hectares of irrigated land was to be reallocated to peasant farmers; were they not, therefore, the main beneficiaries? For three seasons they were not able to farm their land, and trees and crops were destroyed by heavy machinery; no compensation was paid, because the project was based on cost-benefit calculations which attributed very little value to existing farming activities. Then the farmers were told to grow wheat instead of their staple crop, sorghum. In 1980, when peasant resistance culminated in a blockade of the project, a police assault led to a high death toll among farmers. In the aftermath, the Nigerian State was unable to impose contract farming and plantations, and the scheme required heavy subsidies in order to operate; when economic crisis hit Nigeria as a result of the fall of the global oil price in 1983, the Bakolori Project and many other large-scale irrigation schemes were unable to proceed as planned (Beckman, 1984). The impact of the dam on downstream floodplain agriculture was severe: it reduced the area of rice by 7,000 hectares and dry season crops by 5,000 hectares, out of a total of 19,000 hectares of floodplain land (W. Adams, 1992). Thus peasant farmers both on and off the scheme were the losers, and the national economy did not benefit. The only beneficiaries were the Nigerian bureaucracy and the construction firms, with their linked interests and shared ideas of what constituted modernity.

An African dam is like Aswan High Dam in Egypt, built as a symbol of the Nasser régime, which has caused reduced fertility and erosion of land which sustained floodplain agriculture for thousands of years. It is like Akosombo Dam on the Volta River in Ghana, which was to set newly independent Ghana on the road to industrial development by providing energy to turn the local bauxite into aluminium, as well as several hundred thousand hectares of irrigated land; the US firm which owned the aluminium smelter insisted on using imported bauxite, and demanded that the dam be used for power alone. The dam was built, but few in Ghana benefited, save those who had a share of the money spent on construction; not even Kwame Nkrumah, who was overthrown by a coup a month after inaugurating the dam. An African dam is like Kariba and Cabora Bassa on the Zambezi, and Kafue Gorge on the Kafue; like Kainji on the Niger in Nigeria, and Lagdo on the Benue in Cameroon; like Masinga Dam on the Tana River in Kenya, supplying the disastrous Bura Project (W. Adams, 1992). An African dam is like Manantali.

When Manantali and Diama were inaugurated in 1992, President Abdou Diouf declared: 'Today, I am convinced that Africa will win its fight.' But what Africa? and against whom? Underlying the equity issues raised by African dams, is the question of the place of peasant farmers, pastoralists,



fishermen and their families in Africa's future, bound up with that of the urban poor; the question, one might say, of whether African nations have a future at all.

### 4.3. How Can Things Change?

These are outcomes of a process. By considering the the process as it unfolds, by discerning how equity issues have been (frequently) obscured and (rarely) revealed, this paper has sought to identify practices as good or bad. It may now be possible to ask whether any of the outcomes might have been different, or might still be.

The story of Manantali as an African dam, shows very clearly that the norm is denial of equity issues (seen here as subsuming distributional issues) by dam-connected State bureaucracies and by donors. There is no need to impute evil intent, or even venality. The dam project has its own set of founding assumptions, and its own momentum. More than any twentieth-century artifact perhaps, dams embody modernity; and modernity means not taking equity issues into account. If you take equity issues into account, you don't build dams.

If that is so, there seems, considering the matter dispassionately, little reason to hope for self-regulation by the donor-bureaucracy complex. Such hope as there is, stems from the intervention of advocacy groups and dam-affected peoples. Each alone has limited impact; together, the impact is potentially great.

There will be cause for hope if, as seems possible, a world-wide review of social impacts of dams should suggest that the main groups benefiting from dams - bureaucracies, 'new farmers' and donors themselves - are not likely, of themselves, to change their behaviour, but will continue to fund, build and profit from dams. and that to the limited extent that donors have become more accountable, it is due to the unremitting efforts of a relatively small number of NGOs and advocacy groups, in conjunction, increasingly, with groups of dam-affected people and their spokespersons. If that were to be so, the way forward in Africa would not be to urge donors and State bureaucracies to a change of heart, but to intensify the tentative good practices that can help give an active role to the other protagonists of dam-related activities. bring about the beginnings of change. For reasons amply documented in this paper, there is every reason to be deeply pessimistic about the chances of success of such an undertaking; but, for the same reasons, there seems to be no alternative.

To have an alliance of advocacy groups and dam-affected people enter the mainstream of development planning, would be to ensure that equity issues are taken into account. It may also ensure that not many dams get built. So be it; what there is to build instead, is a sustainable future for us all. Those whose lives depend on saying No deserve our best help; they are in the vanguard of the struggle for our common future.

One might suggest a few preliminary guidelines, to be applied before any proposed intervention; they can only be preliminary, because the idea of 'intervention' itself needs to be done away with.

- :explore thoroughly all sources of information about the country as a whole and the areas and communities to be affected
- investigate the full range of alternative solutions before approving any specific project
- seek out respected independent spokespersons within or close to communities to be affected, to assess their views on the proposed action
- elicit the views of affected communities and persons about the proposed action (does it address a genuine problem? Are there other ways that problem could be solved?), in particular through open discussion using appropriate MARP techniques
- have all aspects of the proposed action appraised by an independent commission, with particular attention to equity and distributional issues, before any decision is taken

- ensure that affected communities and persons are closely involved as decision-makers in all stages of implementation
- be prepared to accept a negative outcome

#### 4.4. Manantali: The Way Forward

This paper's review of the past twenty-five years of Senegal River development calls into question the very basis of the OMVS programme; for it signals the failure, not only of its purported social objectives, but also of the economic and financial objectives which were from the beginning paramount; not only is the distribution of costs and benefits wildly skewed, but the costs are likely to outweigh the benefits in absolute terms. But this history also offers, as the legacy of its few recurring good practices - the work of the Institute for Development Anthropology on SRBMA, aspects of PDRG and of IRD's recent work on optimizing reservoir management - a way of redressing the balance: the idea of using flood support from Manantali to restore insofar as possible the environment and livelihoods of River people downstream from the dam.

The benefits of flood support in confronting the paramount equity and distributional issue in Senegal River development are evident; as we have seen, after an exceptionally favourable accidental release from Manantali in 1994, all the land suddenly available for flood-recession crops was farmed (Le Roy, 1997); given an opportunity to express themselves freely, Valley farmers and pastoralists consistently assert that the return of 'a good flood' is their top priority (Adams & So, 1996).

.But a reversal of perspective in River development, can take one still further: flood support is a necessary, but not a sufficient condition for balanced development of the River's resources. The heavy floods of 1999, due to exceptionally heavy rains which caused the River, unassisted by Manantali, to rise to levels unheard-of since 1974, are a salutary reminder that flood support can only be one aspect of an integrated approach, which must include other forms of water management: flood control at basin level, water harvesting and spreading, and of course irrigation (Adams, W., 1992).

Once flood support is guaranteed, it becomes possible to improve the yields of flood-recession farming by controlling the flood at basin level. A dike built along the river-bank serves to isolate the flood-plain from the river, while protecting irrigated perimeters against exceptionally high levels of flood. Flood-gates on the water-courses which convey water to the basins, serve to control entry and especially exit flows, so that water can penetrate deeply into the soil. In the middle and long term, they will make it possible gradually to expand the area brought under irrigation, while still ensuring groundwater recharge, the reproduction of fish, and preservation of grazing land and tree cover. Land thus made available for irrigation, lying above the chosen level of flooding, would be precisely the most appropriate for irrigated farming, being neither too heavy, nor too permeable (Nuttall, 1991) A scheme of this sort was successfully implemented, at least in technical terms, at R'kiz in Mauritania (Castellat, 1992).

Other experimental schemes for the improvement of flood-recession farming, in Mauritania and Mali, involve partially damming a seasonal water-course, so that it flows into low-lying *waalo* land rather than into the River (Kerbout, 1996; Couture, 1998). This is a reminder of the close relationship between the flood plain of a river, land flooded by a seasonal water-course, and land watered by run-off water without a visible course; as reflected, for instance, by the use of the term 'wetlands' to designate all three. Thus flood control at basin level must be considered in connection with other forms of water conservation such as water-harvesting, usually linked with rain-fed farming.

These water harvesting techniques, initially used by farmers on individual fields, can be extended progressively to cover a wider area, a valley or catchment area, leading to the use of more demanding techniques: half-moons, tree-planting trenches, earth or stone dams. They can serve multiple purposes: agriculture, agro-forestry, conservation of farming land, regeneration of sterile land,

combating erosion (Dupriez & de Leener, 1990; Reij, Scoones & Toulmin, 1996; Kessler *et al.*, 1995). In the River context, damming seasonal watercourses to use their flood inland, protecting irrigated perimeters and in the long run helping to control unwanted flooding of the river in years of heavy rainfall, as well as the heavy accumulation of silt in the river-bed, which the River's current is too weak to carry away. Here too, better use of all the area's resources could greatly extend the benefits of River development, improving access to land, and strengthening a community's hold on its *terroir*.

If the priority is no longer to make dams profitable at all costs, according to narrow economic criteria, but to revive peasant family farming, irrigated, flood-recession and rain-fed farming can be considered complementary modes of agricultural production, each with its own advantages and constraints.

Access to water for irrigation implies having the resources to meet the costs, if not of perimeter construction or pumps, at least of fuel and pump repairs. In the long run, making irrigation a permanently available option to peasant farmers, requires production of a surplus, however modest, which can be marketed at a profit. One of the main reasons why PIV were unable to provide a lasting model for irrigated farming on the River, even before the New Agricultural Policy of the 1980s, was the inability to produce such a surplus; farmers needed to consume all their crop, and subsistence irrigation, at least using diesel pumps, is not a viable proposition in the long term, however ingeniously it was kept going during the 1970s with income from sale of animals or seasonal migration. By reviving flood-recession farming, flood support could affect the other main equity issue raised by Manantali, by improving the conditions of access to irrigated farming for peasant farmers, as irrigated farming would no longer be not the sole subsistence activity, but an additional opportunity open in particular to younger farmers.

Proceeding thus would favour the integration of irrigated farming within the full range of modes of agricultural production in the Valley, and would give every chance of repeating and extending, but this time on a durable basis, the success of village irrigated perimeters in the 1970s. A research team which spent many years monitoring peasant farmer-based irrigation in the Valley, concluded that it was a mistake to see PIV as a transitional stage, when the PIV spirit represented the best hope for irrigation in the Valley (Diemer & Huibers, 1991). Support from other, less costly and therefore less risky forms of farming, might help revive that spirit, if concomitant measures are taken to help keep costs as low as possible. A hopeful sign in this direction is the case of a peasant farmers' association in the Bakel area, which introduced irrigation before SAED's arrival in the area and has recently rehabilitated its irrigated perimeters; This association, the Fédération des Paysans Organisés de Bakel (FPOB), always maintained that irrigation was best seen as complementing other forms of farming - rain-fed farming in their case, which was not, of course, affected by Manantali (Adams & So, 1996).

The balance between flood-recession and irrigated farming, the eventual use of water-harvesting and spreading techniques, are things which each village would have to work out in the context of its own *terroir*. Currently planned changes to existing land tenure legislation are designed to encourage private investment and guarantee its security. To avoid all unforeseen consequences, it would be best to delay enforcement of any new laws on land tenure, until such time as the inhabitants of each village have been guaranteed secure access, perhaps by a system of long-term leases, not only to such of the village's land as they require for subsistence farming, but also to such land as will enable their young people, in a climate of renewed confidence, to venture on farming initiatives. In a blocked political landscape, one way forward would be a genuine grassroots planning initiative, starting from what the inhabitants of each village know about their *terroir*, to involve them actively in formulating of plans for the future. The tools for this already exist, notably in the shape of MARP techniques adapted to make it possible for the newly literate (today in Pulaar, tomorrow in Wolof or Sooninke) to involve all the inhabitants of their villages in research and planning (Guèye & Ly, 1996).

Recentring Valley agriculture around renewed complementarity between flood-recession, rain-fed and irrigated farming, as proposed here, offers obvious prospects of renewal to family pastoralism, which has always been structured around the complementarity between *waalo* and *jeeri*, both by making it easier for herds to stay in the near *jeeri*, and by providing fodder for livestock during the dry season, both through flood-recession pastures and irrigated forage crops and crop residues. If Manantali is managed in such a way as to ensure regular flood support, pastoralists will be guaranteed yearly flood-recession pasture-lands. And slowing the pace of bringing land under irrigation, in order to promote better integration of all systems of agricultural production in the Valley, could help provide livestock with regulated access to the River. Furthermore, the much-needed drainage of Delta irrigated perimeters should make it possible to create large pasture-lands by controlled flooding, which would also serve to maintain ground cover and protect against erosion. As for pastoralists in the Sylvo-Pastoral Zone, their most important need at present is security of land tenure.

The above measures for reducing losses and maximizing gains from Manantali, apply primarily to the Valley and adjacent areas, rather than to the Delta. They should not harm Delta farmers in any way, provided that water allocation to irrigated farming is surrounded by the same guarantees as the allocation for flood support. In the Delta, the conditions of access to irrigated farming remain problematic; in addition to the cost of irrigation to individual farmers, there is the threat to the environment of hastily built, unregulated irrigation schemes. As a counterpart to public investment in major structural improvements to irrigation and drainage networks, private irrigation schemes could be regulated by a system of allocating land on long-term leases, conditional upon cooperation between adjacent land-users, a organizational efficiency and transparency on the part of farmers' associations, and respect for regulations concerning the environment. Genuine farmers, in the Delta, 'old' or 'new', as opposed to speculators, have nothing to lose and everything to gain from such measures. Also, as we have seen, there is a need to consider all water-users, not just irrigators; the management of Diama dam must be reviewed so as to minimize the losses suffered by pastoralists, fishermen and the Delta nature reserves and bird sanctuaries (Duvail, Hamerlynck & Ould Baba, 1998).

The idea of flood support, once introduced, could have led to a fundamental debate on the choice to be made in agricultural policy for the Senegal River Valley: striving to make the dams generate revenue, or using them to ensure the survival of peasant family farming and related activities. This debate in turn could have led to the conclusion that by opting for the former course of action, one makes the latter impossible; while the reverse is not true. As we have seen, this debate did not take place, and the future was mortgaged by default. Yet the question remains open for a short time yet; if the debate does not take place now, the question will be resolved once and for all, and the losers from Manantali Dam will have lost out forever.

In the absence of any political will to enforce flood support from Manantali, the only hope, as suggested by the general conclusions reached above, would seem to be for pressure to be brought to bear on donors by an alliance of dam-affected people and advocacy groups, to ensure that the outcome of final negotiations on the Water Users' Charter and Management Handbook, guarantees regular flood support, calibrated to meet the needs of downstream farming and pastoralism while consolidating present levels of irrigated farming and safeguarding its future as a sphere of individual initiative open to peasant farmers and others. This would be an extremely difficult negotiation to achieve, because, as already said, it implies not minor adjustments, but a major shift of priorities: 'making the last first,' to borrow a phrase.

As Thayer Scudder wrote in an afterword to SRBMA's final report:

*The time has come to adopt a new approach to river basin development, for several reasons. First of all, the ecological, economic and socio-political costs of river basin development strategies*

*which cut down on annual flood are becoming ever clearer. Secondly, more and more stress is being placed on the need for development to meet the needs of the low-income rural majority. Thirdly, African governments are more concerned to decentralize decision-making to the local level. Fourthly, there is a growing awareness that successful management of the environment requires that the rural poor participate in and benefit from it. Development strategies which impoverish these populations and degrade some of the most productive ecosystems in Africa, are wholly out of date. (IDA, 1991: 318)*

From their point of view, the State and multi-State dam-connected bureaucracies were right to oppose implementation of flood support; for it makes most sense, not as a conservationist measure, but as the starting-point of a new approach to River development, drawing upon all the resources of its environment and people. As such, it implies a reversal of perspective. The Valley's peasant farmers and pastoralists are no longer part of the problem, but a vital part of the solution; support for peasant family farming becomes not merely a social objective but a major economic, political and cultural goal.

## References

- Adams, A. 1977. Le long voyage des gens du Fleuve, Paris, François Maspéro.
- 1985. La Terre et les gens du Fleuve, Paris, L'Harmattan.
  - 1999. Quel avenir pour la Vallée?, forthcoming.
  - and So, J. 1996. A Claim to Land by the River, Oxford University Press.
- Adams, W.M. 1992. Wasting the Rain, London, Earthscan.
- African Development Bank, 1994. Project Completion Report, Manantali Dam, July.
- African Development Fund, 1997. Appraisal Report, Manantali Energy Project, September.
- Bâ, B. M. 1991. 'La question foncière dans le bassin du fleuve Sénégal: l'exemple de la Mauritanie', in Crousse et al, Paris, Karthala.
- Beckman, B. 1984. 'Bakalori: Peasants versus State and Industry in Nigeria', in Goldsmith, E. and Hildyard, N. 1984, Vol. II, Wadebridge Ecological Centre.
- Bessis, S. 1981. 'Faut-il construire les barrages sur le Sénégal?', in Jeune Afrique, 22 July.
- Castellanet, C. 1992. L'irrigation villageoise, Paris, GRET.
- Couture, J.L. 1996. 'Bilan et potentialités des aménagements hydro-agricoles en région de Kayes-Nord: quelles leçons pour le développement rural régional?', paper presented at, Seminar on Aménagement et mise en valeur des bas-fonds au Mali, Sikasso.
- Comité Québec Afrique, 1981. Au Fleuve Sénégal, une population entière est menacée, February.
- Crousse, B., Mathieu, P. & Seck, S. 1991. La vallée du fleuve Sénégal: évaluations et perspectives d'une décennie d'aménagements, Paris, Karthala
- Diemer, G., & Huibers, F.P. 1991. Gestion paysanne de l'irrigation dans la vallée du fleuve Sénégal: implications pour la conception des aménagements hydro-agricoles. Final Report, WARDA/Wageningen Agricultural University.
- Dumont, R. 1981. Le défi sénégalais, Dakar, Enda.
- Dupriez, H. & de Leener, P. 1990. Les chemins de l'eau: ruissellement, irrigation, drainage, Nivelles (Belgium), Terres et Vie
- Duvail, S., Hamerlynck, O. & Ould Baba, M.L. 1998. 'Une alternative à la gestion des eaux du fleuve Sénégal?', paper presented at 2nd International Conference on Wetlands and Development, Dakar, November 8 - 14
- ENDA, 1986. Enjeux de l'après-barrage: Vallée du Sénégal, Paris, ENDA
- Franco, M. 1975. 'Le Programme de développement du bassin du fleuve Sénégal', in Amin, S., Franco, M. & Sow, S. La planification du sous-développement: critique de l'analyse de projets, Paris.
- Goldsmith, E. & Hildyard, N. (eds), 1984. The Social and Environmental Effects of Large Dams, Vols. I and II, Wadebridge Ecological Centre.
- Groupe de Réflexion Stratégique, 1997. 'Etude de faisabilité d'un programme d'action pour l'agriculture de la Vallée du Fleuve Sénégal' (directed by Adrian Adams), photocopied.
- Guèye, B. & Ly, M.A., LOHU: MARP adaptée en langue pular, Dakar, ARED/IIED.
- Horowitz, M. & Salem-Murdock, M. 1993. 'Development-Induced Food Insecurity in the Middle Senegal Valley', in GeoJournal 30.2.
- Institute for Development Anthropology (IDA), 1990. The Senegal River Basin Monitoring Activity: Hydrological Issues, Parts I and II (Dr. G.E. Hollis), Binghamton, N.Y.
- Institute for Development Anthropology (IDA), 1991. Suivi des Activités du Bassin du Fleuve Sénégal (SRBMA): Rapport Final Intégré (Horowitz, M., Salem-Murdock, M.), Binghamton, N.Y. Also published as Les barrages de la controverse: le cas de la Vallée du Fleuve Sénégal, Paris, L'Harmattan, 1994.
- IRD-OMVS, 1998. Etudes de l'optimisation de la gestion des aménagements de l'OMVS, Phase I, Rapport de synthèse, Dakar, March.
- IRD-OMVS, 1999. Impacts potentiels de la gestion des ouvrages et des eaux de surface du Fleuve Sénégal sur l'agriculture de décrue. Rapport de synthèse, provisional version, Dakar, January
- Kerbout, M., 1996. 'Conditions et problèmes de mise en valeur dans la moyenne vallée du Sénégal: la région de Maghama', in Cahiers d'Outremer, 49 (195), July-September.

- Kessler, C.A. et al, 1995. Choix et modalités d'exécution des mesures de conservation des eaux et des sols au Sahel, Documents sur la Gestion des Ressources Tropicales, Wageningen Agricultural University.
- Lavigne Delville, P. 1991. La rizière et la valise, Paris, GRET
- Le Gal, P.Y., & Dia, I., 1991. 'Le désengagement de l'Etat et ses conséquences dans le delta du fleuve Sénégal', in Crousse.
- Lericollais, A. 1980. Peuplement et cultures de saison sèche dans la vallée du Sénégal, ORSTOM-OMVS, Dakar.
- Le Roy, X. 1997, 'La place des cultures de décrue dans les systèmes de production irriguée', ORSTOM, Dakar.
- Maïga, M. 1995. Le fleuve Sénégal et l'intégration de l'Afrique de l'Ouest en 2011, CODESRIA, Dakar.
- Mathieu, P. 1991. 'Irrigation, transformation économique et enjeux fonciers', in Crousse.
- McCully, P. 1996. *Silenced Rivers: the Ecology and Politics of Large Dams*, London, Earthscan.
- Mission d'Etude et d'Aménagement du Canal du Cayor (MEACC), n.d., Canal du Cayor: l'espoir, République du Sénégal, Ministère de l'Hydraulique.
- Mission d'Etudes et d'Aménagement des Vallées Fossiles (MEAVF), n.d. 'Pour une meilleure valorisation des ressources hydrauliques du Sénégal', République du Sénégal, Ministère de l'Hydraulique.
- Mounier, F., 1984. 'The Senegal River Scheme: Development for Whom?', in Goldsmith; E. & Hildyard, N. (eds), Vol. II
- Mouvement des Acteurs de la Vallée, Document Paysan presented at GRS Seminar, Ndoum, September 25-27, 1997.
- Niasse, M. 1991. 'Les périmètres irrigués villageois vieillissent mal, in Crousse.
- Nuttall, C. 1991. 'Quels types d'aménagement du territoire? La moyenne vallée du fleuve Sénégal dans la perspective de l'après-barrage', op. cit.
- OMVS, 1999. Programme d'Atténuation et de Suivi des Impacts sur l'Environnement (PASIE) de la mise en valeur du fleuve Sénégal, definitive version, Dakar, January 1999
- 'Open Letter to M. Abdou Diouf, President of the Republic of Senegal' signed by 15 French NGOs, Paris, March 1982
- ORSTOM, 1997. Comparaison de trois scénarios de gestion du barrage de Manantali, Dakar, photocopié.
- PNUD-OMVS, 1974. Programme intégré de développement du bassin du Sénégal, 12 volumes, Norbert Beyrard, Paris, 1974
- Reij, C., Scoones, I. & Toulmin, C., 1996. Techniques traditionnelles de conservation de l'eau et des sols en Afrique. Paris, Karthala.
- Republic of Senegal, Ministry of Planning and Co-operation, 1984. Conseil Interministériel sur les Perspectives et Stratégies de Développement de l'Après Barrages, November.
- Republic of Senegal, Ministry of the Economy, Finance and Planning, 1994. Plan Directeur de Développement Intégré de la Rive Gauche du Fleuve Sénégal (PDRG), March.
- Republic of Senegal, 1995. Programme d'Ajustement Sectoriel Agricole (PASA).
- Republic of Senegal, Ministry of Agriculture, n.d. Programme d'Investissement du Secteur Agricole, 1995-2000.
- Santoir, C., 1994, 'Décadence et résistance du pastoralisme: les Peuls de la vallée du fleuve Sénégal', in *Cahiers d'études africaines*, XXXIV-1-3.
- Seck, S. M. 1991, 'Sur la dynamique de l'irrigation dans la vallée du fleuve', in Crousse et al, 1991.
- Thébaud, B. 1996. 'Vers une reconnaissance de l'efficacité pastorale traditionnelle; les leçons d'une expérience de pâturage contrôlé dans le nord du Sénégal', IIED Drylands Programme Issues Paper n° 55, April.
- World Bank, 1997. Staff Appraisal Report, Regional Hydropower Development Project, juin 1997

## **Annex 1**

# **MOUVEMENT DES ACTEURS DE LA VALLEE**

## **DOCUMENT PAYSAN**

### **POUR LE SEMINAIRE DU GRS SUR L'AGRICULTURE DE LA VALLEE DU FLEUVE**

**NDIOUM, 25 - 27 SEPTEMBRE 1997**

## **INTRODUCTION**



La Vallée était autrefois le grenier à mil du Sénégal. Toutes les activités y réussissaient: agriculture, élevage, pêche, commerce, artisanat... La régularité de la crue et des pluies assurait une faune et une flore abondantes. L'équilibre social était manifeste: paysans, pêcheurs et éleveurs vivaient en harmonie. L'argent avait peu d'influence sur leur vie quotidienne.

La sécheresse des années 70 est venue bouleverser cet équilibre. La SAED a voulu secourir les populations en introduisant l'agriculture irriguée; mais en vain. Les barrages et les aménagements hydro-agricoles ont introduit de grands changements dans la vie des populations riveraines. Mais on voit aujourd'hui que ces changements ont créé beaucoup de difficultés, liées à l'irrégularité des crues, à l'endettement des paysans, à la disparition des pâturages et des parcours de bétail, au défrichement intensif des forêts, à la pollution de l'eau, à la prolifération des maladies endémiques, à la rareté du poisson, à l'exode...

Face à ces graves problèmes, les différents acteurs de la Vallée, paysans, éleveurs et pêcheurs, s'interrogent sur leur avenir.

## LA VALLEE D'HIER ET D'AUJOURD'HUI

Après avoir longtemps été parmi les zones les plus prospères du Sénégal, la Vallée est plongée de nos jours dans une pauvreté indescrivable. Les grands programmes initiés par l'Etat et certains bailleurs de fonds n'ont pas amélioré la situation; c'est même en partie à cause de ces programmes que la Vallée rencontre de plus en plus de difficultés.

### 1. L'AGRICULTURE

*Hier, l'auto-suffisance alimentaire était une réalité évidente*

Trois types de cultures réparties dans l'année permettaient d'avoir de quoi vivre décentement: d'une part les cultures sous pluie, et d'autre part les cultures de décrue, kolangal et falo. Avec une durée limitée de travail, et des rendements élevés, l'agriculture de la Vallée bénéficiait pleinement de l'abondance de la crue et des pluies. Les sols étaient fertiles, et après les récoltes les champs servaient de pâturage (ñaayngal) à un élevage prospère. Les coûts de production étaient très bas; l'agriculture couvrait tous les besoins. Le paysan échangeait ses produits contre du lait, du bétail, du poisson, de l'argent, sans épuiser son stock. Le grenier familial n'était jamais vide. Les populations vivaient bien et se portaient bien.

« Je pense que la manière dont on vivait hier était meilleure que celle d'aujourd'hui car l'agriculture, la pêche, l'élevage et même l'enseignement coranique marchaient bien. Hier on cultivait le diéri et le waalo, car il y avait la pluie et la crue. Les populations vivaient en solidarité, avec dignité et respect. Les gens se suffisaient à eux-mêmes, il y avait des riches et des pauvres. » (Oumar Issa Sow, Gamadji)

« Hier le Fouta s'appelait village à trois cases: case des pêcheurs, case des éleveurs et case des agriculteurs. C'était le fleuve qui avait réuni les populations: la crue était abondante, toutes les terres étaient inondées (kolaade, foonde, pale). Il y avait de l'eau partout: mares, vallées, forêts, les plantes poussaient et les poissons avaient des lieux de reproduction. Pendant l'hivernage l'on cultivait le diéri, on récoltait beaucoup de mil. Une partie était ramenée au village, et l'autre partie restait aux champs dans des greniers jusqu'à l'année prochaine. Après la récolte du diéri, l'on cultivait le waalo (kolaade, foonde, pale) pendant les contre-saisons froide et chaude. L'agriculture était très rentable et

l'on obtenait tout: nourriture suffisante, vêtements, parures (or et argent et perles), argent et aller à la Mecque. Le Fouta était un zone de commerce intense. » (Baba Demba Diallo, Galoya)

« Dans le waalo l'on cultivait le sorgho, dans le diéri le petit mil souna, les pastèques béref, les arachides, le niébé. Dans le fonde on cultivait le maïs, et dans les pale la patate. » (Alhousseynou Djigo, Fanaye)

« Autrefois, chez nous, pendant l'hivernage les gens cultivaient dans le diéri. Dès qu'il pleuvait, toute notre maisonnée partait au Boundou. Les femmes cultivaient de l'arachide. Les hommes semailent du maïs, du sorgho, du fonio. Ils retournaient au bord du fleuve pour semer du maïs; juste pour donner aux enfants du maïs frais, parce qu'ils savaient que ça serait inondé. Puis ils revenaient dans le diéri. A la fin de l'hivernage, ils ramenaient avec eux de quoi vivre pendant la saison sèche; le reste, ils le laissaient dans leurs greniers du Boundou pour l'hivernage suivant. Quand ils retournaient au bord du fleuve, la crue s'était retirée. Là où le sorgho gajaba donnait bien, on semait du gajaba; là où le maïs donnait bien, on semait du maïs. » (Mpali Tandjigora, Koungani)

#### *Aujourd'hui, l'auto-suffisance alimentaire n'existe plus*

L'absence de crue et de pluie en est une des causes. La pluie est aux mains de Dieu. Mais avec les barrages, la crue pouvait être maîtrisée au bénéfice des habitants du Fleuve; or cette promesse n'a jamais été tenue. Les lâchers incontrôlés du barrage de Manantali ont fini par anéantir même les cultures de falo, jadis essentielles parce que couvrant la période de soudure.

Les cultures irriguées aussi ont éveillé des espoirs chez les paysans; mais les défauts d'aménagement, l'inefficacité de l'encadrement technique, l'appauvrissement des sols ont été autant de déceptions. Les barrages n'ont même pas assuré un niveau suffisant pour les cultures irriguées de contre-saison. Les coûts de production sont devenus exorbitants. La mise en place de la CNCAS n'a fait qu'accroître l'endettement des paysans, vu son taux d'intérêt très élevé. La loi sur le Domaine National a rendu le paysan étranger sur sa propre terre; maintenant, avec les modifications proposées à cette loi, il est même menacé de la perdre.

« Lorsque les propriétaires terriens ont entendu parler de barrages, ils ont cru avoir atteint le développement; mais après avoir vécu quelques années avec les barrages, ils ont compris qu'ils constituent plutôt un frein pour le développement. L'eau ne vient plus au moment voulu, elle se retire trop vite, les lâchers incontrôlés viennent noyer les champs déjà semés. Aujourd'hui il n'y a plus de foonde et de falo. » (Oumar Issa Sow)

« Les lâchers de crue non maîtrisés ont détruit la culture du waalo. A chaque fois que les semis poussent, c'est une nouvelle crue qui vient noyer les plantes, et elles meurent. Les populations n'ont rien et sont obligées de cultiver des petites parcelles même si elles ne donnent rien. » (Hamidou Alhousseyni Ba)

« Si les barrages marchaient comme il faut, le fleuve serait plein pendant quatre mois, puis il se retirerait. C'est ce qui nous conviendrait à nous. Ainsi nous pourrions avoir de bonnes récoltes de falo comme autrefois. Sinon, la vie devient de plus en plus dure. Un pauvre qui n'a pas assez de force dans ses bras pour cultiver le waalo, peut cultiver le falo et avoir de quoi se nourrir. C'est maintenant qu'il n'y a plus de crue, que nous souffrons vraiment de la faim. On ne vit que d'argent; si tu n'as pas d'argent, tu n'as qu'à mourir, ou voler, ou mourir en prison. » (Demba Sakho, Diawara)

« Aujourd'hui, le barrage a complètement gâté nos falo. L'eau ne les atteint plus à cause des bancs de sable. Là où l'eau peut monter, quand elle se retire nous faisons des semis pour avoir un peu de maïs; dès que le maïs a grandi un peu, ils font un lâcher d'eau et le maïs meurt. » (Manael Diallo, Manael)

« On doit changer le système de crue actuel. L'année dernière personne n'a cultivé le waalo parce qu'il n'y avait pas de crue. Il faut laisser la crue inonder les pale et les kolaade pour permettre les cultures de décrue. Le Fouta ne peut pas se développer sans la crue. Les difficultés des agriculteurs sont les mêmes de Bakel jusqu'à Dagana, car les gens vivent de l'eau. » (Coumba Ifra Dieng, Walaldé)

« Ils ont gâté notre fleuve. Nous n'avons que la terre et l'eau. A présent, il n'y a pas d'eau; la terre n'est pas cultivée. Les terres de collengal ne sont pas cultivées: il n'y a pas de crue. Les terres irriguées ne sont pas cultivées, parce que les paysans ont des dettes. » (Diabé Sow, Koungani)

« Nous voudrions qu'il y ait beaucoup d'eau dans le fleuve: pour les falo et les périmètres, pour avoir du poisson à pêcher, pour pouvoir irriguer nos périmètres. Mais avec le barrage tel qu'il est actuellement, même l'eau d'irrigation nous manque. Le barrage, ça ne va pas. Nous autres cultivateurs le savons bien. » (Silly Tapa Bathily, Tiyabu)

« Nous manquons d'eau pour irriguer nos périmètres. Si tu n'as pas beaucoup de tuyaux, quand tu cultives en contre-saison, que ce soit pour faire des oignon, des tomates ou du maïs, le fleuve baisse jusqu'à ce qu'il sèche, et tes cultures avec. Tu n'as pas de tuyaux en longueur suffisante pour que ta pompe arrive au bord de l'eau. Voilà la première perte qu'ont causé les barrages. Nous nous en sommes plaints partout, mais en vain. » (Manael Diallo, Manael)

« L'agriculture d'aujourd'hui a fait disparaître la solidarité. Avec les barrages et l'agriculture irriguée, l'individualisme s'est développé et l'agriculture, l'élevage et la pêche ont régressé considérablement. La sécheresse a détruit tous les arbres, les terres sont nues. L'accès à l'eau pour l'agriculture est devenu trop difficile, car il faut une machine qui coûte très cher. Tout les paysans sont restés inactifs faute de moyens.» (Oumar Issa Sow)

« De 1973 jusqu'en 1981, il n'y a pas eu de pluie et de crue. Beaucoup de personnes ont quitté leur village à cause de la faim et des problèmes. C'est en 1982 que l'Etat du Sénégal a initié le projet Ngallenka dans la zone de Thilé Boubacar; 28 champs ont été aménagés et les populations sont entrées dans de nouvelles activités dont elles ne savaient rien. Le riz et la tomate ont commencé à être exploités dans la zone. Au début le résultat était très positif mais maintenant cela a diminué considérablement. Les champs ne donnent plus les mêmes rendements. Aujourd'hui, toute la production ne dépasse pas les frais. » (Alhousseynou Djigo)

« Quand les gens de la SAED sont arrivés, ils tendaient des cordons pour nous montrer où faire les canaux. Nous avons creusé nous-mêmes nos canaux, avec nos pics et nos pelles: le canal principal et les canaux secondaires. Avec ça, ils ont dit qu'ils ont aménagé nos terres; ils sont venus nous mettre des dettes autour du cou, en nous donnant l'engrais et le gazole à crédit. Les dettes d'une année, celles de l'année suivante les trouvaient encore en place. Le peu que tu récoltais, tu le vendais pour payer tes dettes; même avec ça, tu ne t'en sortais pas. C'est ça qui fait que beaucoup de périmètres ont été abandonnés. » (Dramane Diarra, Bakel)

« Avec l'agriculture irriguée, l'on a installé la CNCAS avec un crédit incontrôlé et un taux d'intérêt élevé. Les paysans sont endettés et vivent avec une corde autour du cou. Après la récolte aucun paysan ne peut payer sa dette et avoir de quoi vivre, même pour un mois. » (Oumar Issa Sow)

« Toute culture a son importance sauf la culture irriguée du riz. Nous empruntons de l'argent pour faire une campagne; après la récolte, la banque ne veut pas être payée en nature et nous demande de vendre notre produit pour payer en argent liquide. Nous vendons alors à un prix dérisoire et n'arrivons pas à rembourser intégralement le crédit. Il arrive souvent que des gens fuient avec des crédits pris au niveau de la banque en se faisant passer pour paysans, alors qu'ils ne le sont pas. » (Aliou Samba Ba)

« L'Ile à Morphil a beaucoup de problèmes. Les surfaces exploitées dans les périmètres sont trop petites: une famille de 10 à 22 personnes bénéficie de 10 à 20 ares. Le groupement de promotion féminine regroupant plus de 400 femmes, ne dispose que de deux hectares; la jeunesse, d'un hectare. Les cuvettes n'existent pas dans l'île, sauf à Ndioum. Le crédit n'existe pas actuellement, car les premiers à contracter des crédits n'ont pas pu rembourser à cause de problèmes de production; on peut saisir leurs terres. Pour les femmes, elles n'ont pas accès au crédit car aucune femme de l'Ile n'a jamais bénéficié d'un crédit; la CNCA leur demande une garantie qu'elles n'ont pas » (Coumba Ifra Dieng)

## 2. LA PECHE

*Hier, la pêche était florissante*

Le fleuve, les marigots et les mares regorgeaient de poissons. La principale cause en était la crue annuelle, qui inondait les zones de reproduction et mettait une nourriture abondante à la portée des poissons. En outre, le respect des normes de pêche aidait à mieux gérer cette activité. Tout cela faisait que la pêche nourrissait les populations; l'autosuffisance alimentaire était garantie.

« Le poisson pond en brousse, dans les mares. Les oeufs de certains poissons éclosent deux ou trois mois après la ponte; mais pour que tous les oeufs soient éclos, il faut attendre la fin de l'hivernage. A ce moment-là, tous les poissons auront fini de se reproduire. Mais dire que du moment que la crue monte puis se retire, le poisson peut se reproduire, ce n'est pas vrai. Deux mois ne suffisent pas pour que le poisson se reproduisent. Il faut que l'eau reste en brousse pendant trois ou quatre mois. » (Kalidou Harouna Mbodj, Lobali)

« Quand les poissons se reproduisent, les mares se remplissent de poissons. Quand l'eau se retire, elle laisse des poissons en brousse. Nous, à cette époque, nous allons à la pêche. Nous prenons beaucoup de poisson; une fois qu'on en avait assez pour les repas de midi et du soir, on faisait sécher le reste. Nous autres Toroodo, nous ne sommes pas de grands pêcheurs; c'est comme ça que nous pêchions. » (Bala Oumar Sy, Gourel Ndara)

« Le chef de village envoie quelqu'un pour voir si l'eau de la mare a assez baissé pour qu'on commence à y pêcher. Finalement on dit: 'Allons-y.' On annonce dans plusieurs villages: 'Tel jour, nous irons pêcher telle mare.' Tout le monde y va. A ce moment-là, il y a beaucoup de poisson. La pêche dure depuis le matin jusqu'à environ une heure. Puis un crieur dit aux gens de sortir de l'eau. Trois fois de suite, personne ne pêche dans cette mare si ce n'est ces villages. Après, on peut aller attraper des poissons pour le repas de famille, ramasser du poisson à faire sécher pour l'hivernage. » (Diabé Sow, Koungani)

« Il y a des fosses d'eau profonde où on interdisait la pêche. On déclarait qu'on allait réserver tel endroit pendant un certain temps. Ainsi les poissons auraient un endroit où vivre. On fixait des dates; celui qui ne les respectait pas, aurait des problèmes. » (Demba Sy, Diella)

*Aujourd'hui, la pêche n'est plus productive*

Actuellement, par manque de crue et de pluie, le poisson devient de plus en plus rare; on assiste même à la disparition de certaines espèces. Il n'existe plus de zones de reproduction ni de fosses pérennes, à cause de l'obstruction des marigots et de l'ensablement du fleuve causés par le barrage de Manantali. La pollution des eaux est une menace permanente pour la pêche fluviale. L'autosuffisance alimentaire n'existe plus: le poisson nous vient d'ailleurs, et même nos pêcheurs consomment du poisson de mer, le yabooy.

« Maintenant, le poisson a diminué jusqu'à disparaître. Chacun sait qu'il n'y a plus de poisson dans le fleuve. Chacun sait que le fleuve est gâté. Depuis que le barrage de Manantali fonctionne, aucun Somono n'est heureux du fleuve. » (Adama Diarra, Golmy)

« Les problèmes des pêcheurs sont apparus lorsque le niveau du fleuve a baissé et surtout lorsque les barrages ont été installés. Les lâchers incontrôlés créent la panique chez les poissons; même s'ils ont pondu des oeufs, ceux-ci sont emportés par le courant. » (Ousmane Ba)

« Il n'y a plus de fosses d'eau profonde; où peut vivre le poisson? Toutes les fosses sont comblées. Avant, il y avait beaucoup d'eau. A cette époque, il n'y avait pas Manantali. Depuis que Manantali est arrivé, pêcheur, cultivateur n'ont que des malheurs. On cultive, et l'eau noie les cultures; on tend son filet, et avant le matin l'eau l'emporte, le filet est perdu. » (Moussa Dia, Golmy)

**3. L'ELEVAGE***Hier, l'élevage était une activité très rentable*

L'élevage était vivant et le pasteur motivé. La crue et la pluie étaient abondantes; il y avait beaucoup de pâturages, dans le jeeri comme dans le waalo. Le ñaaingal (droit de pâturage sur les champs après récolte) était obligatoire. Les vaches fournissaient beaucoup de lait, et assuraient dès leur jeune âge une reproduction importante. Il y avait peu de maladies, et les taux de mortalité étaient très faibles. L'Etat apportait à un moment donné un appui important aux éleveurs (forages et soins vétérinaires), ce qui permettait de limiter la transhumance. Le troc permettait à l'éleveur de vivre convenablement, et d'approvisionner toute la Vallée avec l'excédent de sa production.

« J'ai 84 ans et c'est à l'âge de 3 ans que j'ai commencé à me souvenir de quelque chose. Mes premiers souvenirs sont liés essentiellement à l'élevage. A la fin de l'hivernage, ma famille et moi récoltions les champs de mil; ce mis était mis dans des greniers. Nous laissons dans le diéri les vieilles personnes surveiller les champs de pastèques et de niébés pour nous rendre au waalo avec nos animaux. Il s'agit d'une période appelée kawngal, où l'herbe du diéri commence à se dessécher, où la crue du waalo se retire; avec l'humidité, les premières pousses d'herbe font leur apparition. Nous quittons une verdure de diéri qui finit, pour entrer dans une verdure qui débute. Le lait est très abondant; nous femmes l'échangeaient dans les grands centres comme Ndioum, contre du bœuf, du niébé, du sorgho.

« A ce moment précis du kawngal, des pêcheurs venaient s'installer près de nos campements. Les petits poissons nés au début de la crue ont déjà grandi; la pêche était florissante. Nous échangeons également notre lait contre du poisson; nous avons des réserves de poisson sec. Le lait, le beurre, le poisson, la viande, les céréales, tout était à notre disposition. Nous vendions rarement nos animaux; cependant nous en donnions beaucoup à nos voisins pêcheurs et agriculteurs.

« Avec le retrait définitif de la crue, c'est le tour de nos parents Torobé agriculteurs de venir s'installer près de nos campements. Ils sont venus semer leurs champs. Ce qui faisait que la demande de lait devenait plus importante; la clientèle augmentait encore. Nous avions encore plus de céréales, que nous allions stocker à Ndioum chez nos tuteurs Torobé. Après les semis, les agriculteurs rentraient pour revenir cinq mois après pour les travaux de gardiennage et de récolte. Quelques-uns de nous profitaient de leur départ pour aller chercher les vieilles personnes restées dans le diéri. Nous revenions au waalo avec nos bidons remplis de beurre stocké depuis la période de l'hivernage. Nous prenions nos stocks de beurre, du diéri comme du waalo, pour aller les vendre à Podor, chef-lieu de cercle. Nous avons beaucoup d'argent pour payer des habits pour toute la famille et payer nos impôts. Le troupeau était toujours épargné; il n'était pas vendu.

« Je me souviens que ma famille avait 400 chèvres et moutons, et sept vaches. Mon père était connu pour avoir beaucoup de chèvres. A sa mort, en 1950, la famille a hérité de 100 vaches; car le surplus des petits ruminants était échangé contre des bovins.

« L'élevage, je le crois fermement, ne saurait réussir sans cette alternance waalo - diéri. Toute ma richesse, je la dois à ce genre d'élevage. J'ai été à la Mecque deux fois, ma mère une fois et ma soeur une fois. Il faut laisser venir la crue, permettre à l'élevage de s'épanouir au waalo. Le waalo, c'est l'élevage: huit mois de verdure sur douze dans l'année. » (Sikh Galo Sow, Namarel)

« Le paysan respectait l'agriculture et l'élevage; il laissait des zones de pâturage et de parcours de bétail. Le droit de l'éleveur d'engraisser son troupeau, était aussi le droit de la terre à une perpétuelle fertilisation. L'élevage était un élément fondamental dans la pérennisation de l'agriculture (fertilité des sols, moyen d'épargne et de gestion des périodes de soudure) et de la pêche (alimentation des poissons). » (Baba Demba Diallo)

#### *Aujourd'hui, cette activité n'est plus rentable*

L'élevage est en train de mourir à petit feu dans la zone; le pasteur est devenu le plus misérable des citoyens du Sénégal. La prolifération des maladies et le taux de mortalité élevé du cheptel entraînent sa ruine. Il est laissé à lui-même, car l'Etat n'assure plus les soins vétérinaires. La disparition des parcours de bétail et des pâturages de décrue a chassé l'élevage de la Vallée. Le manque de crue et de pluies met les animaux dans une situation de soudure permanente; le cheptel n'a rien à manger, le taux de reproduction est très faible. Il n'existe même pas de mesures de protection permettant à nos éleveurs de faire face à la concurrence des pays voisins.

« C'est à partir des années 50 que l'on a construit les premiers forages dans le diéri, une zone habitée jadis seulement pendant l'hivernage. La saison sèche voyait beaucoup d'éleveurs transhumer vers le waalo, à cause du manque d'eau. L'élevage alternatif diéri - waalo, c'est l'élevage appuyé en permanence sur des pâturages frais: la verdure d'hivernage du diéri, et dans le waalo les pâturages de décrue, les résidus de la récolte de décrue et les denses forêts, surtout de gonakiés.

« Les forages se sont donc installés progressivement dans le diéri. Les éleveurs ont commencé à s'installer au niveau des points d'eau nouvellement créés, mais continuaient à descendre au waalo. C'est avec les grands aménagements hydro-agricoles et la fermeture de beaucoup de parcours de bétail que l'élevage a perdu sa place dans le waalo. Il s'est replié au diéri, où les seuls bons pâturages sont de courte durée: trois mois d'hivernage. La longue saison sèche allait causer beaucoup de problèmes aux animaux: carences alimentaires, maladies de toutes sortes.

« Au début, c'est l'Etat qui subventionnait les frais liés aux forages; après, ils ont été à la charge des éleveurs; des éleveurs complètement démunis, à cause de la pollution et des maladies des animaux,

les pannes fréquentes des forages, le manque de pâturages lié aux pluies aléatoires, la mévente des animaux par suite de la concurrence des pays limitrophes. » (?)

#### 4. LES RESSOURCES NATURELLES

Hier la Vallée était verdoyante, avec une faune et une flore abondantes. On parle aujourd'hui de ceinture verte; alors, les forêts existaient pour de bon, et servaient de brise-vents pour freiner l'avancée du sable. La crue et les pluies étaient régulières, et les normes d'exploitation des ressources naturelles étaient respectées. Paysans, pêcheurs et éleveurs avaient tout intérêt à bien les gérer.

Aujourd'hui la Vallée est méconnaissable; l'on assiste à une avancée inquiétante du désert, à l'absence de la crue et des pluies, et à une érosion gagnant de plus en plus de terrain. Les défrichages liés aux aménagements, les permis d'exploitation abusive de bois délivrés par l'Etat sont les principales causes de la disparition du couvert végétal et de la faune au niveau de la Vallée. Le lessivage progressif des terres par une agriculture irriguée mal entretenue constitue une des inquiétudes majeures des populations. Elles ne disposent plus que d'une eau polluée, porteuse de maladies de toutes sortes. L'abaissement du niveau de la nappe phréatique, et la fréquence accrue des vents de sable, sont des motifs supplémentaires d'angoisse au sujet de l'avenir.

« Je pense que le problème des bancs de limon dans le fleuve, c'est une question de manque d'eau. Avant l'eau coulait en abondance, le courant était fort et le limon ne pouvait pas se déposer. Mais maintenant, l'eau dépose ce qu'elle charrie; le courant n'est pas assez fort pour l'emporter, et le dépôt augmente chaque année. » (Mpali Tandjigora, Koungani)

« Notre fleuve est maintenant rempli de bancs de sable. On fait maintenant des cultures de décrue au milieu du fleuve. Là où jadis la perche d'un piroguier ne touchait pas le fond, on passe maintenant à gué. » (Dramane Diarra, Bakel)

« Après l'hivernage, envoyez-nous des gens à qui nous ferons visiter le fleuve. Ils verront qu'on y cultive maintenant l'arachide, au beau milieu. Ils verront cela, ils l'écriront, ils prendront des photos. Le jour où le Président de la République verra cela, il dira: Je ne me rendais pas compte.

« Maintenant, ils recherchent de l'argent pour faire un autre fleuve qui emportera l'eau dans le diéri. Cela veut dire qu'ils auront de l'argent pour les faire travailler. Est-ce qu'ils se rendent compte du mal que cela va faire? Il n'y a pas assez d'eau. Le Fleuve est à sec. Cette année, il y a des périmètres qui n'ont pas pu cultiver en contresaison. C'est détruire la Vallée pour faire vivre le diéri. Il ne faut plus toucher au fleuve. Nous ne voulons pas devoir abandonner la Vallée pour aller nous installer dans le diéri. » (Diabé Sow, Koungani)

« Dans notre zone, le barrage a causé de nombreuses maladies. L'eau donne la bilharziose aux enfants. Elle cause aussi une sorte de démangeaison de la peau. Chez les adultes comme chez les enfants, le paludisme n'en finit pas; il y a plus de cas maintenant qu'autrefois. Il y a un autre type de moustique qu'on appelle muxunmuxaane, qui vit parmi les arbres. Autrefois, quand venait la saison froide, les moustiques diminuaient. Maintenant, il y a des moustiques en toute saison. » (Demba Sakho, Diawara)

« Autrefois, on buvait sans problèmes n'importe quelle eau. Nous craignons alors l'eau du diéri, car on disait que si on en buvait sans la filtrer, on s'exposait au ver de Guinée. Mais maintenant, nous buvons plus volontiers l'eau de puits que l'eau du fleuve. Pourquoi? Parce que maintenant l'eau du fleuve cause plus de maladies que l'eau du diéri. Il y a notamment une maladie qui empêche les enfants d'uriner. Cette maladie vient de l'eau. Nous pensons qu'elle est causée par l'eau stagnante

qui vient du barrage se mêler à l'eau du fleuve en période d'hivernage. Autrefois nous buvions l'eau du fleuve, et ni enfants, ni adultes n'avaient cette maladie-là. » (Mpali Tandjigora, Koungani)

« Le paludisme fait des ravages: le Paluject n'est plus efficace, et il n'y a pas de moyens, route et véhicule, pour évacuer les malades. L'eau a amené beaucoup de maladies, car les lâchers d'eau ne respectent aucune norme. L'Initiative de Bamako n'existe pas. Les gens sont pauvres, car il n'y a ni crue ni pluie; quand on tombe malade, on risque de mourir. » (Coumba Ifra Dieng)

« En 1995, au mois de février, un avion épandait des produits phytosanitaires dans les périmètres de tomates, car il y avait beaucoup de parasites; le poison est tombé dans le fleuve à Dimat et a tué beaucoup de poissons. Ce phénomène s'est répandu jusqu'à Fanaye. Ce poison n'a d'ailleurs servi à rien, sinon à augmenter les dettes. Il y avait des périmètres qui devaient payer 1.500.000 F chacun. Beaucoup n'ont pas encore payé leurs dettes jusqu'à présent. » (Alhousseynou Djigo)

## 5. QUE SERA LA VALLEE DE DEMAIN?

Un constat s'impose: plus rien ne marche aujourd'hui, il est temps de s'arrêter et de s'interroger sur la voie à suivre. Certes de grands investissements ont été réalisés (barrages, aménagements). Mais pour toutes les raisons qu'on a dites, les populations de la Vallée n'en ont pas bénéficié. Elles n'ont jamais été consultées. Les programmes de développement proposés par l'Etat, qui leur étaient pourtant destinés au préalable, les ont au contraire plongées dans la détresse; elles ne parviennent même plus à se nourrir elles-mêmes.

« Si l'on ne sait plus où on va, on retourne d'où on vient », nous dit un proverbe. Dans tous les secteurs d'activité, agriculture, pêche et élevage, il va falloir retourner en arrière pour pouvoir avancer. Les populations de la Vallée demandent d'urgence:

- le rétablissement d'une crue régulière favorisant l'agriculture, l'élevage et la pêche;
- la réorganisation de l'agriculture irriguée, pour qu'elle leur soit plus accessible;
- la protection de l'élevage contre les importations;
- la mise en place d'une politique de santé adéquate, face notamment à la pollution et aux maladies liées aux barrages et aux aménagements;
- la participation des populations à toutes les décisions de développement (notamment en ce qui concerne l'utilisation de l'eau du fleuve, les politiques d'aménagement, les changements à apporter à la loi sur le Domaine National), au niveau non seulement de la communauté rurale, mais aussi régional et national).

« Nous pensons que les initiateurs des barrages ont une autre utilisation de l'eau que d'inonder les terres de culture. Notre souhait est d'avoir une crue de quatre mois pendant l'hivernage comme autrefois. Après cela, ils peuvent amener l'eau là où ils veulent: Canal du Cayor, que sais-je? » (Oumar Issa Sow)

« C'est à travers la crue que l'agriculture, l'élevage et la pêche vont se développer, et c'est par là que passera le développement de la Vallée et du Sénégal. » (Coumba Ifra Dieng)

« L'élevage doit être soutenu, le système d'alternance diéri - waalo doit être réinstauré. » (Alfa Sow)

« S'il y a des mesures pour contrecarrer la concurrence des pays limitrophes, notre bétail se vendrait à bon prix. Parce que le sucre de la Mauritanie est interdit, le sucre de Richard Toll, bien que plus cher, se vend bien.(?)



« Nous pensons qu'en période d'hivernage, ils devraient remplir la brousse d'eau. Si la brousse est remplie d'eau, quand l'eau se retire, chacun qui en a la force peut récolter de quoi vivre. Il y aura assez d'eau pour irriguer; ils pourront retenir l'eau du barrage, pour qu'elle ne gêne pas les cultures. » (Manael Diallo, Manael)

« Avec de bonnes motopompes et de l'eau dans le fleuve, nous pensons que ceux qui cultivent les périmètres devraient pouvoir bien vivre. C'est ainsi que le pays pourra se développer. Les pauvres seront soulagés de leurs souffrances, et les autorités seront tenues en estime par les populations. » (Manael Diallo, Manael)

« Il faut réinstaurer notre agriculture d'hier et laisser la crue jouer pleinement son rôle en y associant la nouvelle forme d'agriculture avec une organisation adaptée. Ce que le paysan a capitalisé comme expériences, le technicien ou l'ingénieur en agriculture qui n'a fait que la théorie sur le papier, ne peut le savoir. » (Aliou Samba Ba)

« Je n'affirme pas que les barrages ne sont pas utiles; ;mais qu'on laisse la crue inonder les terres de waalo. Les agriculteurs pourront cultiver, les éleveurs avoir des pâturages et les poissons se reproduire. La culture irriguée a ramené l'agriculture en arrière. Même si l'on ne peut pas la laisser complètement, il faut la réorganiser et la rendre plus accessible en permettant davantage les cultures de décrue.

« Pour les aménagements, il faut dépasser les aménagements sommaires qui ne permettent pas un bon rendement. Si le gouvernement veut aider les paysans, il doit diminuer le prix des intrants et le taux d'intérêt du crédit, en augmentant la durée de remboursement; Le paysan est toujours dans la terreur de voir ses terres saisies par défaut de remboursement. L'objectif d'aider n'est pas conforme avec la saisie, car celui qui vient aider ne devrait pas saisir les biens du pauvre paysan.

« Le waalo est une terre qui appartient à ceux qui habitent de Bakel à Saint-Louis. Si l'on veut la paix, la tranquillité et le développement, on doit laisser la terre à ses propriétaires, car chaque lopin est reconnu à quelqu'un. Si le Gouvernement veut aménager pour aider les populations, il doit leur reconnaître ce droit de propriété. » (Oumar Issa Sow)

« Maintenant, nous ne laisserons plus personne se mettre devant les paysans. Nous ne laisserons plus personne parler au nom des paysans, qui n'est pas paysan lui-même. Avant de faire quoi que ce soit, il faudra nous demander notre avis. Et il faudra faire ce que nous voulons, ce qui permettra à nos enfants de vivre. Il n'y a qu'à constater: depuis qu'on parle de développement, de Kidira jusqu'à Saint-Louis, le développement, où est-il? A quoi a servi tout cet argent? Il a servi à d'autres; pas à nous. Nous demandons au gouvernement et à ceux qui l'aident, de regarder derrière eux. » (Diabé Sow, Koungani)