

**Senegal: Irrigation N'Galenka**

**Ex-post evaluation report**

<b>OECD sector</b>	31140/Agricultural water resources	
<b>BMZ project number</b>	1) Investment measure: 1990 65 178 2) Complementary measure: 1996 70 068	
<b>Project executing agency</b>	Société Nationale d'Aménagement du Delta et la Vallée du Fleuve Sénégal et de la Falémé (SAED)	
<b>Consultant</b>	Hydroplan	
<b>Year of ex-post evaluation</b>	2007	
	<b>Project appraisal (planned)</b>	<b>Ex-post evaluation (actual)</b>
<b>Start of implementation</b>	1) October 1995 2) January 1996	1) May 1997 2) October 1996
<b>Period of implementation</b>	1) 3 years 2) 4 years	1) 5 years 2) 10 years
<b>Investment costs</b>	1) EUR 17.2 million 2) EUR 0.5 million	1) EUR 16.0 million 2) EUR 1.3 million
<b>Counterpart contribution</b>	1-2) EUR 0 million*	1-2) EUR 0 million*
<b>Finance, of which FC funds</b>	1) EUR 17.2 million 2) EUR 0.5 million	1) EUR 16.4 million** 2) EUR 1.3 million
<b>Other institutions/donors involved</b>	-	-
<b>Performance rating</b>	3	
• <b>Relevance</b>	2	
• <b>Effectiveness</b>	3	
• <b>Efficiency</b>	3	
• <b>Impact</b>	3	
• <b>Sustainability</b>	3	

\* Excluding non-monetary counterpart contributions by the target group in erecting the irrigation perimeters

**Brief Description, Overall Objective and Project Objectives with Indicators**

The N'Galenka Irrigation Project consisted in extending the upper N'Galenka (a creek of the Senegal River) into a feed line for irrigation water and laying out approx. 40 minor village perimeters (périmètre irrigué villageois - PIVs) covering an area of 1,000 hectares. In the original plan, the N'Galenka was to be extended to provide irrigation water for approx. 2,000 hectares of additional minor perimeters set up by private investors. The smallholder user group was supported through a complementary measure in organization, land allocation and farming.

The overall objective was to make a contribution to economic development in the Département Podor and to alleviating the national food shortage.

No indicator for overall objective achievement was defined at project appraisal. The project objectives were the improvement of income opportunities and food security for approx. 26,000 people in the Département Podor.

The indicators for project objectives achievement were:

- Area, cropping intensity and yield of the irrigation land developed as PIVs (size 1998: 600 hectares; 1999: 1,000 aggregate hectares; cropping intensity: at least 1.53; yield: for rice > 4.5 t/hectare, for tomatoes and onions > 25 t/hectare)
- Development of private irrigation land (1999: 700 hectares; 2000: 1,500 hectares; 2001: 2,000 hectares (aggregate))

Though not explicitly included in the set of objectives, the project aimed at achieving large beneficial poverty impacts. This is also evident from the calculated return of about 2% judged as acceptable in the project appraisal report, although this fell short of the minimum (3%) for economic infrastructure projects in least developed countries, such as Senegal.

### **Project Design/Major Deviations from Original Planning and Main Causes**

Project implementation largely adhered to plan. The consultant confirmed the technical practicability and the economic rationale of the project in a feasibility study. The programme design was developed by the executing agency, the Société Nationale d'Aménagement du Delta et la Vallée du Fleuve Sénégal et de La Falémé (SAED) with the consultant. The villagers were already involved in the planning phase through the formation of user associations. The irrigation land was demarcated on the basis of soil investigations by the consultant with the cooperation of the villagers. The irrigation land was allocated by the village communities and the development measures conducted by SAED. The counterpart contributions by the users comprised clearance of the irrigation land, detailed planning and digging furrows in the fruit and vegetable-growing plots. Similar to an open-ended programme, a good overall compromise was struck in planning and implementation between technical aspects and target-group participation.

Owing to initial general problems (adverse price trend for agricultural products, particularly rice, and tardy land law reform), the implementation was split into three phases (Pilot phase, Phases I and II), with the start of the respective sequel phase made contingent on conditionalities, the timely provision of counterpart contributions and cropping intensity (which amounted at that time to 1.3 according the executing agency), for example. The main change in technical implementation was the abandonment of the intended extension of the N'Galenka to provide sufficient irrigation capacity for the additional 2,000 hectares of PIVs to be set up by private investors, when it emerged that a sustainable development was unlikely due to the general conditions. The hydraulic cross-section of the upper reaches of the N'Galenka was therefore smaller than originally planned, which made for cost savings of approx. EUR 3 million. Additional technical adjustments included considerable additional costs for erosion control measures and the use of electric instead of diesel-fuelled pumps as originally planned. The project term was considerably prolonged as a result of phasing and related additional costs for the consultant; the complementary measure (EUR 0.89 million) was financed by reprogramming the investment capital.

The quality of the technical execution of the N'Galenka irrigation system can be rated as good. Maintenance of the intake structure and the course of the N'Galenka river serving as a main channel is performed satisfactorily by SAED. The quality of the relatively basic irrigation systems (submerged pumps at metal footbridges that deliver the water into the head structures of the respective secondary channels through pressure lines) is sufficient to good. The planting of windbreak hedges was not successful; the farmers only tend those around some fruit plantations.

In the project altogether, 48 village perimeters were laid out measuring an area of 1,112 hectares and distributed amongst 2,633 users by the village communities. Added to this is the development of 37 hectares of irrigation land for fruit and vegetable growing cultivated by women's groups.

### **Key Results of Impact Analysis and Performance Rating**

The 1,112 hectares of irrigation land established in the PIVs is largely used by the farmers to grow rice (approx. 2/3 of the area). The share of land used for vegetable-growing is relatively large (about 1/3). The diversification affords the farmers a certain safeguard against fluctuating prices for their products, particularly for rice, much of which Senegal now imports. At 1.0, cropping intensity is lower than the original aim, because cultivation is generally confined to the main cropping season. A major reason for this are the insufficient agricultural loans provided to the farmers, which deprives them of the necessary short-term funds to purchase the requisite inputs for a second cropping period. SAED supports the user organizations in their negotiations with the government and the banks to change lending conditions (longer term, allowing for time overlaps).

The main channel upkeep is the responsibility of SAED, which has the necessary technical and personnel capabilities to perform its regular tasks. The costs for this are financed through annual charges of FCFA 20,000/hectare paid by the PIVs. The operation and maintenance of the PIVs is the job of the users, who were assisted in forming groups in the complementary measure. Support has also been given in founding an umbrella organization of PIVs. No information is available on the fees charged by the PIVs to individual users. Due to the close participation of the users in project implementation, the contributions made and their direct self-interest in functioning perimeters, it is reasonable to assume that the necessary funds for operation and maintenance are forthcoming in a PIV, unlike some problems with charging and collecting fees in large-scale irrigation perimeters in Senegal. The irrigation technology does not seem to cause the farmers any difficulties. The efficiency of the irrigation largely depends on the quality of levelling. The system of rotating irrigation (every irrigation plot is usually watered once a week) under mutual supervision would appear to function for the most part. An indicator for this are yields per hectare, which largely exceed the targets at project appraisal: 6 t/hectare for rice, 18 t/hectare for onions and 25 t/hectare for tomatoes. Family income estimated in a model calculation amounts to about FCFA 463,000 (compared with FCFA 258,000 before project implementation), to which the diversification into vegetable-growing has made a substantial contribution.

The project aimed at direct poverty alleviation. No exact figures are available on the extent of target group poverty, but it exceeds 50%. The target group took active part in the measures with considerable contributions of its own and has organized itself into user groups. By establishing these groups, which were entrusted with a large part of operational responsibility for the perimeters, the project has contributed to improved participation. It afforded scope for improving gender equality. This potential has been put to use by appropriate measures (assignment of irrigation land to women's groups). The project did not aim at environmental improvements. Measurements at a few points indicated a low risk of salination. The risk of spreading water-transmitted diseases (malaria, bilharzia) is low in the assessment of expert consultants in a BMZ evaluation.

We assess the developmental performance of the project as follows:

- **Relevance:** The intended project results chain of bringing about a substantial rise in agricultural production and hence income by extending irrigation land was plausible. The ex-post evaluation, however, found that the assisted farmers' lack of access to agricultural credit poses a major constraint that detracts from the success of the project, which envisaged benefits in agricultural production and income. Another adverse factor are the lower earnings, at least in rice growing, due to the deregulation of rice imports. As part of its alignment, the project used the available capacities of SAED for the operation of the major irrigation infrastructure. Organizing the farmers into user groups has built capacities to enable them to run the PIVs largely on their own. The (broken) rice imports to Senegal due to trade deregulation have put heavy downward pressure on prices to the detriment of domestic rice production. We assess relevance as

satisfactory (Subrating 2).

- **Effectiveness:** The project objectives defined at appraisal of improving income opportunities and food security for about 26,000 people in Département Podor were ambitious, comprising the entire department. This additional agricultural production enabled by the project's expansion of irrigation land by 1,148 hectares is not sufficient to have any substantial effect on food production in the whole of the department. The yield targets defined for the different crops have been met for the most part (target for tomatoes/onions: 25 t/hectare; actual: 18 t/hectares) and exceeded for the main crop, rice (target: 4.5 t/hectares; actual: 6 t/hectares). The indicators defined for measuring project objectives in raising cropping intensity (original target: 1.3; actual 1.0; revised target: 1.5; actual: 1.3) and the target land area for developing additional PIVs by private investors (target 2,000 hectares) have not been met. It would have been sensible to change the latter indicator appropriately when the decision was taken during implementation to extend N'Galenka less than originally planned, since private investors had little interest in erecting PIVs, probably due to the deregulation of rice imports. Total annual yield for the main crop, rice, falls short the target by about 13%. We assess the effectiveness of the project as sufficient overall (Subrating 3).
- **Efficiency:** Due to the requisite additional measures in erosion control and to the smaller acreage than expected, the specific investment costs for the construction of the perimeters were very high (production efficiency). Based on a rough model calculation, a macroeconomic return of 1% has been estimated, above the minimum threshold for projects of special poverty relevance in least developed countries (0%). Altogether, we assess the efficiency of the project as sufficient (Subrating 3).
- **Impact:** Based on model calculations, the annual income of the approx. 2,600 families (about 15,000 persons) allotted the irrigation areas in the PIVs has increased by FCFA 205,000 to some FCFA 463,000 (around EUR 700). This exceeds the national definition of the extreme poverty line. The contributions to both poverty reduction and to improving food supply are, however, considerably less than expected at project appraisal, since for one thing cropping intensity has not been raised substantially for lack of adequate agricultural loans and for another, private investments have not been made in developing PIVs. Other beneficial effects include the self-organization of the PIV farmers into user groups. Altogether, we assess the developmental impact of the programme as sufficient (Subrating 3).
- **Sustainability:** At the time of an inspection as part of a BMZ evaluation, the infrastructure built was in a good state of repair. The user groups formed and their umbrella organization are able to sustain regular operation of the PIVs by charging appropriate fees. The primary infrastructure was designed for low maintenance requirements. The executing agency is supported by different donors in conducting routine maintenance and servicing. We therefore expect the system to be adequately maintained. Altogether, we judge sustainability to be sufficient (Subrating 3).

In all, we assess the developmental efficacy of the project as sufficient (Rating 3).

## **General Conclusions**

To harness the potential of irrigation perimeters for raising cropping intensity, the farming enterprises require sufficient liquid funds. Socio-economic studies in the planning phase should ascertain whether there is a sufficient supply of agricultural credit, otherwise the project design must include additional complementary measures to improve marketing and credit supply.

If the scale of investments financed by FC depends significantly on private follow-on investments, the general conditions for a private commitment should be subjected to detailed analysis in a baseline study. If possible, binding agreements should be concluded with private

investors so that objectives achievement in essential components remains within the scope of the project.

### **Notes on the methods used to evaluate project success (project rating)**

Projects are evaluated on a six-point scale, the criteria being relevance, effectiveness (outcome), “overarching developmental impact” and efficiency. The ratings are also used to arrive at a final assessment of a project’s overall developmental efficacy. The scale is as follows:

- 1 Very good rating that clearly exceeds expectations
- 2 Good rating fully in line with expectations and without any significant shortcomings
- 3 Satisfactory rating – project falls short of expectations but the positive results dominate
- 4 Unsatisfactory rating – significantly below expectations, with negative results dominating despite discernible positive results
- 5 Clearly inadequate rating – despite some positive partial results the negative results clearly dominate
- 6 The project has no positive results or the situation has actually deteriorated

A rating of 1 to 3 is a positive assessment and indicates a successful project while a rating of 4 to 6 is a negative assessment and indicates a project which has no sufficiently positive results.

Sustainability is evaluated according to the following four-point scale:

#### Sustainability level 1 (very good sustainability)

The developmental efficacy of the project (positive to date) is very likely to continue undiminished or even increase.

#### Sustainability level 2 (good sustainability)

The developmental efficacy of the project (positive to date) is very likely to decline only minimally but remain positive overall. (This is what can normally be expected.)

#### Sustainability level 3 (satisfactory sustainability)

The developmental efficacy of the project (positive to date) is very likely to decline significantly but remain positive overall. This rating is also assigned if the sustainability of a project is considered inadequate up to the time of the ex post evaluation but is very likely to evolve positively so that the project will ultimately achieve positive developmental efficacy.

#### Sustainability level 4 (inadequate sustainability)

The developmental efficacy of the project is inadequate up to the time of the ex post evaluation and an improvement is very unlikely. This rating is also assigned if the sustainability that has been positively evaluated to date is very likely to deteriorate severely and no longer meet the level 3 criteria.

The overall rating on the six-point scale is compiled from a weighting of all five individual criteria as appropriate to the project in question. A rating of 1 to 3 indicates a “successful” project while a rating of 4 to 6 indicates an “unsuccessful” project. In using (with a project-specific weighting) the five key factors to form an overall rating, it should be noted that a project can generally only be considered developmentally “successful” if the achievement of the project objective (“effectiveness”), the impact on the overall objective (“overarching developmental impact”) and the sustainability are considered at least “satisfactory” (rating 3).