

# ROLE OF SMALL DAMS



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# TABLE OF CONTENTS

<b>Project sheet</b> .....	<b>3</b>
<b>1. CONTEXT AND JUSTIFICATION</b> .....	<b>4</b>
<b>2. DEFINITION AND OBJECTIVES</b> .....	<b>5</b>
<b>2.1 Definition of the concept of retention pond</b> .....	<b>5</b>
<b>2.2 Objectives</b> .....	<b>5</b>
<b>3. LOCATION</b> .....	<b>6</b>
<b>4. PROGRAMME EXECUTION STRATEGY</b> .....	<b>6</b>
<b>4.1 Construction and development studies</b> .....	<b>7</b>
<b>4.2 Execution works</b> .....	<b>7</b>
<b>4.3 Management and Maintenance</b> .....	<b>7</b>
<b>4.4 Coordination and monitoring/ evaluation</b> .....	<b>7</b>
<b>5. FINANCING</b> .....	<b>8</b>
<b>6. EXPECTED RESULTS</b> .....	<b>11</b>
<b>7. ENVIRONMENTAL IMPACTS</b> .....	<b>11</b>
<b>7.1 A few positive impacts</b> .....	<b>11</b>
<b>7.2 Negative Impacts</b> .....	<b>11</b>
<b>7.3 Mitigation measures of the programme’s negative impacts</b> .....	<b>12</b>
<b>8. DURATION OF THE PROGRAMME</b> .....	<b>12</b>
<b>9. LOGICAL FRAMEWORK</b> .....	<b>12</b>

## PROJECT SHEET

<b>Title of the Project</b>	<b>Retention ponds programme of the Great Green Wall</b>
<b>Structure (s) having initiated the project</b>	Ministry of Environment, Nature Protection, Retention Ponds and Artificial Lakes
<b>Objectives</b>	Development and securing of agro sylvo-pastoral productions : Improvement of biodiversity and ecosystems; Control desertification and ensure water supply and availability: Improve the living conditions of the populations and ensure the sustainability of the actions of the Great Green Wall programme.
<b>Location</b>	Inside and in the immediate vicinity of the corridor of the Great Green Wall
<b>Activities</b>	Execution studies Development and water retention construction works; Development of access roads; Development of irrigated perimeters, Supervision, monitoring and Follow-up Evaluation,
<b>Duration of the execution of major actions</b>	3 years
<b>Expected results</b>	Storage of several million cubic metres of run-off water Development of thousands of hectares for forest plantations and the development of economic activities, Refill water tables and ensure the irrigation of plots ...
<b>Overall cost of the programme</b>	5,600,000,000 F CFA or 12 Million 445 Thousand US Dollars
<b>Stakeholders</b>	State, development partners, populations

## **1. CONTEXT AND JUSTIFICATION**

The Sahelo-Saharan zone corresponds to the climatic area where the average annual rainfall ranges from 100 to 450 mm. The weather conditions there are generally marked by recurrent droughts.

Despite this constraint, every year, billions of cubic metres of water which run off and mainly get lost, while water constitutes for our agriculture the first limiting factor. This obstacle, which has been there for several decades, slowed down among others the pace of land management, the development of food crop farming and partly caused the degradation of agro sylvo-pastoral ecosystems.

Thus, concerned about the danger which threatens the populations, the head of State, Mr Abdoulaye Wade, instructed the government on 10 May 2000 to implement retention ponds and/artificial lakes capable of collecting and storing rain water at the level of all depressions in Senegal.

At present, over 187 retention ponds and reservoir waters developed for various uses out of a national target of 3,240 run-off water storage works.

Thus, these retention ponds or retaining reservoirs built in villages have become real development poles, spaces where post-rainy season agricultural activities predominate. The populations draw the greater part of their incomes from these; rural migration has strongly receded despite the improvement of biodiversity and the restoration of ecosystems.

With regard to these parameters, Senegal has successively organized, in collaboration with Sahelian countries, two international seminars on: (i) the stakes and constraints of retention ponds, (ii) retention ponds, a poverty alleviation means.

These meetings made it possible to share its experience, on the one hand, and to sensitize partners on the need to finance the development of retention ponds in Sahelian land areas, on the other.

At the end of these meetings, experts and development partners all took the view that retention ponds are indeed alternatives to fight against poverty, instruments that make it possible to attain the Millennium Development Goals (MDGs) for the development of small works with great effects, as they favour the restoration of ecosystems, the securing of productions, the reduction of some harmful effects related to climate changes....

In the light of the foregoing, water control through retention ponds or any other retention device constitutes a fundamental action within the framework of the attainment of the objectives of three conventions relative to climate changes,

biodiversity and desertification control. The need to take on board the water control dimension in the Great Green Wall corridor also proves to be indispensable for the sustainability of the programme's actions.

## **2. DEFINITION AND OBJECTIVES**

### **2.1 Definition of the concept of retention pond**

A retention pond is a hydraulic structure designed to collect, store and mobilise run-off waters.

This can be an improved natural pond, an artificial pond, a retention dyke or dikelet, a micro dam, a reservoir water or an artificial lake.

Depending on their volume, these structures can be classified as follows:

- below 100,000 m<sup>3</sup> : retention pond;
- between 100,000 m<sup>3</sup> and 300,000 m<sup>3</sup> : micro dam or reservoir water;
- above 300,000 m<sup>3</sup>: artificial lake.

### **2.2 Objectives**

Regarding the objectives, the retention ponds programme of the Great Green Wall fully comes within the Poverty Reduction Strategy Paper, the Accelerated Growth Strategy and the attainment of the Millennium Development Goals; the latter can be summed up as follows:

- Strengthen the water capital and give priority to putting at the disposal of the populations the resources needed for the improvement of their living conditions;
- Ensure the availability of water in all seasons with a view to taking sustainable actions;
- Promote infrastructure so as to better secure productions, the fight poverty and rural migration.

More specifically, retention ponds also meet the following goals:

- develop, secure and diversify productions;
- refill the water tables, participate in the generation of forests and boosting of livestock;
- develop aquaculture and continental fishing;
- improve livestock watering conditions;
- restore ecosystems and improve biodiversity...

Retention ponds appear as being at the crossroads of the three following conventions: the convention on biodiversity, those on climatic changes and on desertification control.

With this in mind, it is admitted that their presence in the corridor and at the periphery of the Great Green Wall constitutes the keystone of the sustainability of the Great Green Wall programme.

### **3. LOCATION**

The national retention ponds programme concerns all Senegalese villages having basins or sites likely to contain one or several hydro-agricultural structures mainly oriented towards the storage and valorisation of run-off waters. Within the framework of the Great Green Wall, this has to do with low-lying areas' sites, waterways, natural ponds located within the corridor or in its immediate vicinity.

### **4. THE PROGRAMME'S EXECUTION STRATEGY**

Following circular n° 0424/MA/DGR dated the 17 May 2000 which the Minister of Agriculture and Livestock addressed to all territorial authorities, 4,000 retention ponds sites were recorded across the national territory, part of which is estimated at 80 depressions located in the strip defined as being the space reserved for the Great Green Wall.

With regard to the existing potential, and to the tree-planting project to be implemented, the programme execution strategy, as part of the Great Green Wall, takes place in 04 iterative and interdependent phases as below:

- execution studies,
- construction and development works,
- management and maintenance
- monitoring/evaluation coordination

#### **4.1 Construction and development works**

The proposed technical and societal studies for each site retained within the framework of the programme are summarily characterised as follows:

Topographical, hydrological, pedological, socio-economic, environmental, civil engineering, rural engineering and geotechnical studies.

All these studies will be entrusted to private firms under the technical supervision of State services after a call for tenders has been made.

## **4.2 Execution works**

The development works intended for storing waters for the purposes of the plantations of the Great Green Wall will mainly be made up of run-off water retention and regulation works.

The latter will mainly be established in the valleys (micro or big dams, artificial lakes), and natural depression zones in the form of ponds (natural or artificial ponds). Their capacity can vary from 30,000 cubic metres to almost twelve or so million cubic metres of water mainly destined to agro sylvo-pastoral needs and to the populations.

The realisation of the works or the execution of the works for reservoir waters, dykes and all the underlying operations are carried out by the Company with the involvement of the populations for all the tasks defined in the book of specifications.

The development of the space adjacent to the water plan will be done on all potentially irrigable lands destined to the activities retained with partners.

The guiding principle of this operation rests on the development of the surfaces to be irrigated, the protection of the environment, easier access to the zone through the building of access roads and the improvement of biodiversity.

The project provides for the putting in place of development poles geared towards efficient irrigation techniques.

## **4.3 Management and maintenance**

The management of structuring works comes within the remit of the State, while the regular execution of small works and plots is entrusted to the populations organised into management committees.

## **4.4 Coordination and monitoring/ evaluation**

The retention ponds programme of the Great Green Wall is placed under the supervision of the Ministry of Environment, Nature Protection, Retention Ponds and Artificial Lakes and the technical execution is under the responsibility of the Retention ponds and artificial lakes Division.

A monitoring/evaluation Unit will be put in place for an efficient implementation of the actions retained and executed on the ground. The logical framework below spells out the main lines.

## **5. FINANCING**

Within the framework of the retention ponds programme of the Great Green Wall, financing requirements are estimated at **5 Billion 600 Million F CFA, or 2.6%** of the requirements of the national retention ponds programme estimated at 218 Billion 450 Million F CFA.

The table below gives the structuring of the expenses.

**Table N° 1      Financing requirement**

<b>Components</b>	<b>Cost of the retention ponds programme of the Great Green Wall (thousands of francs CFA)</b>	<b>Cost of the National retention ponds programme (thousands of francs CFA)</b>
execution studies and control of works	320, 000	<b>3, 400, 000</b>
building of retention ponds and artificial lakes	4, 960, 000	<b>136, 850, 000</b>
Development of feeder roads and equipping of perimeters	240, 000	<b>66, 300, 000</b>
accompanying actions	-	<b>10, 200 ,000</b>
coordination and management of the project	80,000	<b>1, 700, 000</b>
<b>Total General</b>	<b>5, 600, 000</b>	<b>218, 450, 000</b>

More specifically, the total amount of the financing requirements for the implementation of the retention ponds programme of the Great Green Wall is estimated at: **5 Billion 600 Million francs CFA, or 12 Million 445 Thousand US Dollars** (One US dollar = 450 francs CFA).

The financing plan of the components over the duration of the implementation of the programme stands as indicated in the table below.

**Table N° 2: The financing plan of the programme**

<b>Components</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>TOTAL (in thousands FCFA)</b>
Execution studies (in thousands FCFA)	200,000			<b>200,000</b>
Building of retention ponds and artificial lakes (in thousands FCFA)	1,240,000	1,860,000	1,860,000	<b>4,960,000</b>
Development of feeder roads and equipping of perimeters (in thousands FCFA)	60,000	90,000	90,000	<b>240,000</b>
Monitoring of works		60,000	60,000	<b>120,000</b>
Coordination and management of the project (in thousands FCFA)	30,000	25,000	25,000	<b>80,000</b>
<b>TOTAL (in thousands F CFA)</b>	<b>1,530,000</b>	<b>2,035,000</b>	<b>2,035,000</b>	<b>5,600,000</b>

**Table N°3 Schedule of the programme's activities**

<b>Components</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>
Execution studies	→		
Building of retention ponds and artificial lakes	→		
Development of feeder roads and equipping of perimeters	→		
Monitoring of works		→	
Coordination and management of the project)	→		

## **6. EXPECTED RESULTS:**

The programme, by giving precedence to the execution of hydro-agricultural and pastoral works, will help mobilise significant volumes of water estimated at 10 Million cubic metres and improve the agro sylvo-pastoral activities of the communities polarised by the Great Green Wall.

The programme's contribution will lead to an exponential increase of agricultural production and to the strengthening of food security.

In addition, the programme will favour the diversification of production systems and the increase of yields.

The implementation of the programme will also help create thousands of permanent and seasonal jobs, which limits rural migration.

The programme will make for the emergence of women and youths for their integration into the economic channels. The specific supports that will be brought in the fields of market gardening, commercialisation, access to land, and income-generating activities will help the latter better integrate into the local economic fabric.

Among the advantages the populations can benefit from, one can also cite: the creation of poles or agro-forestry farms, oasis that can help reduce considerably evaporation and participate efficiently in the fight against global warming and greenhouse effect.

## **7. ENVIRONMENTAL IMPACTS**

### **7.1 A few positive impacts:**

The main positive impacts of the retention ponds programme in the corridor of the Great Green Wall can be summed up as follows: (i) the protection of the environment, (ii) the securing of plants, (iii) sustainability of reforestation operations, (iv) development of plants, (v) availability of water, (vi) the restoration of soil fertility, (vii) creation of wetlands, etc.....

### **7.2 Negative impacts**

Among the possible negative impacts can be noted: (i) land reclamation actions related to developments and to the improvement of feeder roads (ii) the increase of risks of pollution of surface and underground waters following an uncontrolled use of fertilizers and pesticides, (iii) the increase of the prevalence of water-borne diseases in view of the creation of new temporary water plans (iv) the risks of conflict between farmers, herders and forest loggers, (v) land expropriation, etc....

### **7.3 Mitigation measures of the programme's negative impacts:**

Appropriate environment management measures will be taken during the implementation of the programme and will contribute to the mitigation of the negative impacts resulting from the different hydro-agricultural development works:

(i) The incidence of water-borne diseases will be mitigated by actions of information, health education and environmental hygiene carried out in communities living close to the works and will be systematically dealt with at the level of intervention areas, in liaison with the technical services concerned

(ii) the prevention of water pollution, the training of farmers in the good use of chemical fertilizers and pesticides will feature in the support and counselling action programme induced by the programme.

(iii) Conflict risks between farmers and herders will be dealt with at the level of the dialogue conducted in rural communities or committees set up by the users of water points.

The programme will intervene in making the space more easily accessible to improve traffic and mobility.

## **8 DURATION OF THE PROGRAMME**

The programme will be executed in three (03) years to ensure the construction of structures, their consolidation and ownership by the populations. It fully comes within the framework of the general programme of the Great Green Wall of which it is a component.

## **9 LOGICAL FRAMEWORK**

The logical framework of the programme presents itself as indicated in Table N° 4 below:

**Table N°4 LOGICAL FRAMEWORK OF THE PROGRAMME**

<b>HIERARCHY OF OBJECTIVES</b>	<b>OBJECTIVELY VERIFIABLE INDICATORS</b>	<b>MEANS OF VERIFICATION</b>	<b>HYPOTHESES / RISKS</b>
<p><b><u>1 – SECTORAL OBJECTIVES</u></b>            Increase and securing of agro sylvo-pastoral production with a view to improving the living conditions of the populations, making a greater number of individuals remain in their land areas and fight poverty, desertification and greenhouse effects;</p> <p>- Make the zone easily accessible through the creation of feeder roads.</p> <p><b><u>2 – SPECIFIC OBJECTIVES</u></b></p> <p>Valorisation of surface water            -land management            - Improvement of water supply;</p> <p><b><u>- 3 – ACTIVITIES</u></b></p> <p><b><u>3.1 of an administrative order</u></b>            - Putting in place of the Management Unit ;</p>	<p>Volume of production and of biomass recorded            - Level of household incomes noted              - Number of plantations observed</p> <p>Number of feeder roads built;</p> <p>- Volume of stored water            - Number of structures / retention ponds executed;            Developed surfaces</p> <p>Putting in place of the staff            Approved bidding documents,</p>	<p>- Statistics of the Ministries in charge of Environment and Agriculture            - Household surveys and spatial assessment.</p> <p>Contracts executed;</p> <p>-Reports and hydrological observations;            - Dams and retention ponds, Surface areas valorised</p> <p>Orders and Decisions available and signed by the authorities.            List and signatures of tenderers;            Bid selection reports.            Registration of contracts</p>	<p>Availability of funds            - Securing of the zone and land</p> <p>- Availability of funds</p> <p>Availability of funds</p> <p>Delay in the procedures</p> <p>Rejection</p>

<p>Launch of bidding documents - Selection of candidates;</p> <p>-3.2 <b><u>of a technical order</u></b> - Development and construction works</p> <p>Studies, Supervision and Monitoring</p> <p>- Monitoring/Evaluation/Coordination</p>	<p>- Submissions received</p> <p>- Number of ponds made Developed surface areas and equipment put in place.</p> <p>- Research and control department in activity on the ground;</p> <p>- Monitoring/Evaluation systems designed and executed</p>	<p>Mission reports and accounts. Minutes of site meetings.</p> <p>Reports, plans</p> <p>Reports and documents of the Coordination Unit and the Division in charge of retention ponds</p>	<p>- Non performing enterprises Availability of enterprises</p> <p>Inadmissible contracts</p> <p>Funds</p>
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