Form A: About your organization

Name of the organization:
SEMIS / GRET / EER, NGO consortium

Brief explanation about the organization:
Semis is a private senegalese office (water and energy)
GRET (groupe de Recherches et d'Echanges Technologiques) is a french NGO of technical assistance
EER (Espace Eolien Regional) is a french non-profit organization specialised in wind energy promotion.

For this proposal, the representative of the consortium is EER.

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Form B : Water Action Statement

ALIZES PROJECT IN SENEGAL
PUMPING AND TREATMENT STATIONS ON THE SENEGAL RIVER

1. DESCRIPTION OF THE PROBLEM AND ACTION AS IMPLEMENTED

Alizes is a NGO project implemented in north-west of Senegal till 1997 : the aim is to supply drinking water to remote villages. The innovative action is to implement pumping and treatment stations on the Senegal river for small villages.

➢ **The needs : to use river water to supply drinking water**

With the development of agriculture, the population increases in the valley of the river Senegal and people use to pick up water in the river ; it is a very hard task and it is very bad for health (diseases linked to water as bilharziosis).
The installation of 2 pumping and treatment stations at the end of 2000 with wind pump (Ndiawdoune village) or PV pump (Guidakhar village) is therefore an innovative action to improve the sanitary situation.

➢ **Ndiawdoune :** village located 10 km East of St Louis (Senegal), around 1000 inhabitants.

Description of the pumping and treatment station :

❶ The water treatment is made in several stages	❷ Distribution network
▪ Decantation of the water pumped in the river by a first wind pump. ▪ Filtration with a fast filter (sand and flint, Buron filter) ▪ Chloration by a volumetric measuring pump (Garhin)	▪ Storage of pumped water (second wind pump) in an elevated basin. ▪ Public drinking fountains are installed in 3 points of the village.

In this case, the multiblades windpump is manufactured by SSM, a senegalese company, and the several components are easily available on the local market.

➢ **Guidakhar :** located East of Richard-Toll, at around 100 km from St Louis. There is around 1000 permanent inhabitants and 500 non permanent inhabitants.
In this case, 2 PV pumps replace the 2 windpumps. Filtration and chloration are done in a closed system provided by Nord-Pompes Company.

2. IMPACT OF IMPLEMENTED ACTION

Less water diseases	The main impact concerns children and it is observed at the wealth house (diarrhoea, bilharziosis decrease a lot). More than 20 m3 of drinking water are produced every day
Less hard task for women	They don't have to walk more than one km from home to river and even in the river. And some women are in charge of the public fountains.
Low costs and creation of jobs	▪ Low investment cost : 50 Euros/inhabitant for the Ndiawdoune pumping and water treatment station. It is lower than a larger grid connected station (around 150 Euros/inhabitant in the same region) ▪ The low O&M cost (no fuel). ▪ Creation of jobs : one permanent employee for the monitoring of the station and 3 women in charge of the public fountains a few hours per day. The manufacture of windpumps at Thiès and civil works create jobs too.
Use of local renewable resources, wind and sun.	The use of renewable energies for pumping is the best solution to avoid green house effect gas.
Good solution for the small villages (£ 1000 inhabitants) near a river	This type of pumping and treatment station will grow in number in the Senegal river valley in the next years. For the local and national authorities it is technically interesting and with a low O&M cost ; tens of villages are concerned. The grid connected stations are too expensive and too large for these villages.

This type of station can be installed in other countries with the same problem of drinking water quality and availability.

3. STAKEHOLDER PARTICIPATION

Stakeholder involved	Role, contribution and ressources
Villages inhabitants	- Management of the station : 1st level maintenance, sanitary control, public fountains, financial management - Financial participation : 920 euros for each village at the installation - Payment of the water : 1130 euros / year for the village of Ndiawdoune
EIC, local company based at St Louis	- Civil works of the 2 stations (44000 euros) - Installation of the station of Guidakhar with the technical assistance of Nordpompes, a French company
SSM, local company based at Thiès	- Manufacture and maintenance of the 2 windpumps of Ndiawdoune (14000 euros)
SEMIS, senegalese private office, NGO	- Management of Alizes project (in collaboration with french NGOs)
ARD, Development regional agency, office of Regional Council of St Louis	- Compatibility of the project with PDRN (development regional program) - With Alizes, ARD is learning to assist a contracting authority (the Regional Council) for this type of projects
Energy and Hydraulic Department	- Alizes advisory board : main orientations, evaluation

4. SUSTAINABILITY

➢ **Measures to assure sustainability :**

- Use of :
  - renewable energies
  - windpumps manufactured locally and using proved technology
  - a simple treatment system
- Low O&M cost : treatment cost is less than 0.03 euro/m3)
- Involvement of local partners : private companies, inhabitants, Energy and Hydraulic Department.

➢ **Obstacles toward sustainability :**

- Difficulties to know precisely wind potential
- Two thefts of PV system at Guidakhar
- Regularity of maintenance
- Sustainability of the local management is linked to the relationship between villagers and to the mobilization of villagers.
- Financial sustainability : It is absolutely necessary to pay for maintenance and for equipment's renewal. So it was decided to sell water at the fountain (0.76 Euro/m3) ; it is not a fixed-price per family or per person.

➢ **Replicability of the action :**

- In similar technical conditions (wind or sun, water, number of inhabitants), technical replicability is not a problem. It is planned to replicate these pumping and treatment system in more than 10 villages of the Senegal valley.
- The investment cost par inhabitant is lower than grid connected station.
- Constraints concern mainly village mobilization both for management and for a financial participation.

➢ **Link to the "Vision" and "Framework for Action"**

- This project has improved water quality in remote villages experiencing severe health problems linked to river water.
- Furthermore the project has been a field test bed for water treatment using renewable energies such as solar and wind suited to the small size of villages (500 to 1000 inhabitants) and to the low income of the local population.

5. COMMITMENT

➢ **Continuation and expansion of the action :**

- During the 1st half-year 2003, the planned tasks are the followings :
  - Completion of actual equipment (in particularly on the site of Guidakhar)
  - Technical and sanitary monitoring of Ndiawdoune and Guidakhar stations

- Training of ARD staff to assistance to contracting authority
- Identification, technical and socio-economic studies to equip 3 further villages of the Senegal valley

▪ After this transition period, it is expected to equip 8 villages during 3 years.

➢ **Commitment to assure sustainability :**

▪ Equipment at village's request : payment of a financial participation to investment and sale of water according to volume

▪ Improvement of local management : for each village, contracting authority by village committee and financial and technical management by a private manager. There will be a contract between these 2 parties.

▪ Utilization of proven technologies, selection of local companies through call for tender for civil works and equipment

▪ Training of private managers and village's maintenance agents and sanitary training by ASBEF, a local skilled NGO

➢ **Expected outcomes versus actual outcomes :**

▪ The pumping and water treatment stations, of high capacity and more complex technically, have an investment's cost superior than expected.

▪ With Ndiawdoune and Guidakhar, around 2000 persons have 20 liters of drinking water per day.

▪ Women of these villages have not to walk a long way, and in dirty water during the rainy season.

▪ With the next 3 years it is expected to supply drinking water more than 6000 people.

6. ORIGINALITY AND INNOVATIVE IDEAS

➢ **The pumping and treatment station using renewable energy and adjusted to the size of villages (500 to 1000 persons) is a innovative solution :**

▪ Generally treatment station are planned for towns and they use fossil energy. Furthermore multibladed windpumps are manufactured at Senegal for several years.

▪ The water treatment is made in several stages : decantation of the water pumped in the river by a first wind pump or a first PV panel, filtration with a fast filter and chloration by a volumetric measuring pump (Ndiawdoune) or filtration and chloration in a closed box (Guidakhar)

▪ Distribution network with a storage of pumped water in an elevated basin in order to get the required pressure in the distribution network and public drinking fountains installed in several points of the village, the village being responsible for it.

➢ **Assistance to these action by several experts :**

▪ Aquassistance : NGO of the staff of a large french company of water distribution (treatment system of Ndiawdoune)

▪ Nordpompes : french company specialized in pumps (treatment system of Guidakhar)

▪ SSM : senegalese company manufacturing windpumps for several years

▪ Espace Eolien Developpement : french wind energy consultant

➢ **Contribution to technology transfer :**

The action allows to test and now to develop these small and cheaper treatment station. Senegalese energy and hydraulic ministry is very interested to install this type of stations on the river valley, where it is impossible to use subterranean water.

During the actual transition period, a capitalization of the experience of Alizes, in particularly on Ndiawdoune and Guidakhar, is carried out.

This action is easy to replicate in villagers using river or lake water. The sustainability of the equipment needs mainly wind or sun, a local mobilization and a good organization for management and maintenance.