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Wind-Solar Hybrid System creates an Oasis in the Sahel

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In the first water pumping project of its kind in Mali, Africa (solar wind hybrid system for pumping water) is managed by a village cooperative and sold to be used for income generating activities, to provide sustainable livelihoods for local people thus directly combating poverty and producing funds necessary for operation and maintenance. Local technicians are trained for operation and maintenance tasks. The project's aim is to develop the concept of a rural service centre which can use Renewable Energy as a platform for services to local communities to stimulate economic development. The project is carried out in the village of Karangana, Sikasso region in southern Mali. It is a joint effort of InterCooperation (a Swiss NGO) and its JEKASY programme, which also co-funds the project together with the UNDP/GEF (Global Environment Fund) Small Grants Programme. It is a good example of the productive use of Renewable Energy in Africa.

The project has resulted in an emissions reduction of 4 tons of CO_2 per year as a result of the use of a hybrid wind-solar system rather than a diesel motor for water pumping. In addition, there are no fuel costs, no air pollution, and very low noise pollution compared to diesel pumping. Local technicians have been trained in operation and maintenance, and a management structure has been created comprising various socio-professional associations in the village. This ensures the financial and organisational sustainability of the project.

Hence the project contributes to reduction of greenhouse gas emissions, combating desertification, the preservation of biodiversity, the improvement of livelihoods through the provision of water for income generating activities, and the reduction of rural exodus caused by improved conditions in the village.

Development of the concept "Decentralised Service Centre"

The Decentralised Service Centre (DSC) concept was developed by the partners of the project as a centre in a rural area that provides services which are paid for by the local population. The community which owns the equipment can delegate its management to a small private enterprise to manage the day to day operation. Such a centre is a means for sustainable development and a catalyst for the local economy (providing income generating activities for the population) as it can increase productivity of an area.

The Malian context

Mali has a population of around 12 million people. National electrification rates are around 12 %, but this drops to just 1 % in rural areas, which is home to 70 % of the population. Traditional biomass represents 92 % of the countries total energy consumption. This means that the vast majority of Malians are living in energy poverty without access to the clean modern energy services which can improve living conditions and foster economic growth. Increasingly expensive fossil fuels are all imported, and must be transported thousands of kilometres by truck to inland Mali. Therefore Mali is in desperate need of alternative energy sources to meet the growing needs of its largely unserved population. Wind-solar hybrid systems are certainly one of the solutions.

A 1kW wind turbine was installed on a tower of 20m height to avoid wind obstruction by trees in the area.

Initial activities of the Service Centre defined with the population

In consultation with the project partners, the village identified four initial activities to start with:

- Sale of water for animals to make the local livestock market viable
- Production and sale of natural tree species
- Development of market gardening
- Production of organic fertilisers

These activities represent ways in which the local population can use the water for productive purposes, so the installation does indeed create a centre of production in the Sahel environment, like an oasis.

Since colonial times in Mali, mechanical wind pumps were used for water pumping in remote areas. Many of the older generation in Mali remember wind pumps working well. However, since that time wind energy technology in Mali has diminished to almost nothing. The installation of a hybrid system

1kW of solar panels complements the wind turbine, with associated benefits of a hybrid system.

was seen as a good way to introduce new and improved wind technology that could provide much needed services to rural populations and which can revitalise the local economy.

Installation of wind speed measurement equipment – perspectives for the future

The project includes an important component for wind measurements, so that a real understanding of the wind conditions and performance can be gained, allowing subsequent optimisation of future systems. This should allow for significant cost reductions which will facilitate any large scale adoption of the technology. It is hoped that the results gained in this project could provide the basis for a much larger wind project for Sahel countries like Mali, Niger, Burkina Faso etc.

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About Mali Folkecenter

Mali-Folkecenter's mission is to promote Renewable Energy & energy efficiency, the sustainable management of natural resources and the use of these resources to catalyse local economic growth & sustainable development by working in partnership with rural populations and local entrepreneurs.

For more information please see: www.malifolkecenter.org