

Empowering Women One Community at a Time



BIOFUEL PRODUCTION AND SUSTAINABLE LAND MANAGEMENT IN GHANA



Project Description

The goal of the project was to develop the capacities of peasant farmers, located on the coastal and northern savanna of Ghana, to invest in sustainable agro-forestry management practices. These practices seek to incorporate the cultivation of sunflower and jatropha carcus to address land degradation whilst ensuring food security and commercial production of biofuel within the context of the United Nations Convention to Combat Desertification (UNCCD) and the United Nations Framework Convention on Climate Change (UNFCCC).

The project seeks to achieve the following specific objectives:

- Develop and sustain the capacities of rural farmers to increase community investment in sustainable land management through market access and trade.
- Assist rural communities to restore degraded lands through integrated water and soil management; community based forest woodlot and agro-forestry; wildfires management; and natural regeneration and cultivation of sunflower and jatropha carcus.
- Support sustainable livelihood enterprises by assisting the farmer groups to set up biofuel processing mills, as well as silos to store and sell grains and cereals.

Background

The project area is within the coastal savannah ecosystem with remnant of pristine semi-deciduous tropical forest being protected under traditional systems. The biodiversity of these traditional forests and watersheds in the area were under threat resulting from shifting agriculture, wildfires, illegal logging and uncontrolled hunting. Because there are no alternative livelihood activities, the farmers in search of new fertile lands, encroach upon the traditionally protected areas and watershed. The intensification of the encroachment posed great threats to future biodiversity conservation. It was estimated that if nothing was done within the next decade, the entire 1,500 hectares of protected area and essential habitat to over 600 different species would be lost.



Implementing Organization: Tema Cooperative Sunflowers Association

Location: in Gomoa East district of Ghana

SGP Contribution: US\$ 25,000

In-cash cofinancing: US\$ 22,200

In-kind cofinancing:
US\$ 11,000

Number of Beneficiaries: 10 communities, 50 farmers and their families

Duration: March 2008 – November 2009

Awards and Recognition:
SEED Award, 2010

Implementation

Capacity building of Farmers: The project developed the capacities of 50 rural farmers to integrate renewable energy production into sustainable land management. The farmers were introduced to two models of sustainable land management systems. These were intensive sedentary farming that does not require the use of fire for clearing land for cultivation and agro-forestry system which integrates sunflower production with food crop cultivation and apiculture.

Establishment of farmers based enterprises: The farmers have been organized into registered farmer based organizations that are investing in tradable products such as bio-fuels, honey, food stuff and other by-products of sunflower processing.

Establishment of a sunflower processing mill: The project installed a sunflower processing mill and bio-fuel digester at Tema to process sunflower seeds into oil and biodiesel.

After one year in operation, the project has produced 1,000 tons of sunflower feedstock, which were processed into sunflower oil and biodiesel. Samples of the biodiesel has been tested and approved by the Ghana Standard Board and the Volta River Authority.

In the second year, the project produced and supplied 2,500 litres of biodiesel to the two tractors being used by the member groups.



Environmental Impact

The multi-integrated models for sustainable land management have yielded significant environmental benefits.

Within two years of operation 200 tonnes of CO2 equivalent was avoided by using bio-diesel for 2 farm tractors.

Between 60-50 bags of chemical fertilizer which would have been used in farming was substituted with the cake residue from the sunflower oil. A test on the sunflower biodiesel revealed that it contained zero sulphur, wax and nitrogen. Sodium and Potassium residues were 0.5 ppmw (compared to expected 10ppmw). Lead (Pb) and magnesium (Mg) residues were less than 0.01ppmw while Nickel (Ni) was less than 0.2ppmw. These are all less than the minimum standard and therefore indicate that the product is very friendly to the environment.

1500 ha of protected land have been restored and 110 ha of farmland have been placed under sustainable land management.

Socio-Economic Impacts

The incorporation of apiculture in food crop production has contributed to food security and increased disposable income.

As a result of the project, the incidence of wildfires within the areas has reduced by 40 percent (based on baseline). The farmers have reduced their cost of production by using the by-products of the sunflower processing.

50 farmers have received training on sustainable agricultural practices and are aware of the impact of unsustainable practices on climate change, biodiversity and land degradation.

Policy Impacts

The Ministry of Environment and Science is considering using sunflower production in the Youth and Employment Programme.

The Ministry of Energy is currently encouraging investments in biofuels as part of the national energy mix policy. In addition, the project has encouraged the Ministry to pursue the Cabinet approval for the Renewable Energy Policy.

Through the project the Chemistry and Chemical Engineering Department of the Kwame Nkrumah University of Science and Technology is conducting aggressive research about production of biofuels. Postgraduate research has started with two students.

The Crop Science Department of the University of Ghana, is conducting research on improved agronomic practices for sunflower production.

At the local level, most farmers in the catchment area are adopting organic farming instead of applying chemical fertilizer.

Gender Equality and Women's Empowerment

The project consciously encouraged and assisted women to cultivate sunflower and invest in livestock and poultry to take advantage of the sunflower cake.

More than 60 percent of the sunflower cakes are distributed to women for free. Some of the women were also engaged in the harvesting of sunflower and the sale of the honey from the sunflower farms.

Two women are members of the project management committee and therefore take part in decision making. Of the 50 families that benefited from the project, 10 are women headed families.

Sustainability

The training given to farmers about the production, processing and utilization of the sunflower contributes to the sustainability of the project.

Availability of markets for the products of the farmers is critical for sustainability. Through the farmer based enterprise, Tropical Agricultural Marketing and Consulting Services (AGRIMAC), market linkages have been created with the industry. Specifically, the Volta River Authority has expressed the desire to purchase 1.6 million tonnes of sunflower biodiesel annually to feed its thermal plant in Aboadze, in the Western Region, Ghana.

The paint producing industries are willing to purchase 0.25 million tonnes of crude sunflower oil for paint production in the country. AGRIMAIC has been registered as a private company that is processing and marketing the biodiesel.

Replication and Upscaling

The model can be replicated in any other parts of the country and other parts of the world where ecological and climatic conditions support the cultivation of sunflower.



The project has established three local enterprises to upscale and replicate the project creating market linkages to expand markets for their products.

The Stanbic Bank in Accra is providing the financial support for the expansion of the cultivation of the sunflower feedstock in the country.

Contribution to the MDGs



- Diversification of income sources for 50 farmers and their families
- Savings of the cost of 50 – 60 bags of fertilizer by using sunflower by-product.
- 50 farmers have received training in sustainable land management, increasing their job opportunities



- Two women are members of the project management committee and therefore take part in decision making.
- 10 of the beneficiary families are headed by women



- 200 tonnes of CO2 equivalent was avoided by using bio-diesel in operating farm equipment.
- Restoration of 1,500 ha of degraded protected areas
- 110 ha of farmland under sustainable land management
- Wild fires have been reduced by 40% from baseline as a result of sustainable land management



Lessons Learned

It is important to establish effective collaboration with research institutions for expert support and use of scientific and technological data.

The inculcation of business principles in this project was critical for its sustainability

It is important to ensure that the right sunflower seeds are available locally for planting and not imported. Integration of the beehives in the sunflower fields not only as diversified sources of income from the production of honey but also as an effective pollination method.



Community Action Global Impact

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