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PRIORITY A.2.3.: Managing Arid and Semi-arid Ecosystems



National Policies and Strategies on Bioenergy in Africa

Case Study: Ghana

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COMPETE

**Competence Platform on Energy Crop and Agroforestry
Systems for Arid and Semi-arid Ecosystems - Africa**

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The Competence Platform on Energy Crop and Agroforestry Systems for Arid and Semi-arid Ecosystems – Africa (COMPETE) will establish a **platform for policy dialogue and capacity building** and identify **pathways for the sustainable provision of bioenergy**

- to improve the quality of life and create alternative means of income for the rural population in Africa
- to aid the preservation of intact ecosystems in arid and semi-arid regions in Africa
- to enhance the equitable exchange of knowledge between EU and developing countries

The current document has been elaborated within Work Package 6 on Policy Development of the COMPETE project by the consortium partner WIP Renewable Energies.

The objective of COMPETE Work Package 6 is to coordinate policy research activities in African countries aimed at facilitating the efficient implementation of improved energy crop and agroforestry systems in order to enhance economic productivity and sustain rural and peri-urban livelihoods. It is also aimed at avoiding adverse environmental and social degradation that could arise from faulty policy development and implementation.

Within the context of the COMPETE Work Package 6 current national and international policies and strategies (including national legal and institutional frameworks) are identified addressing the implementation of improved energy crop and agroforestry systems.

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National Policies and Strategies on Bioenergy in Ghana

Government: Constitutional Republic

President: John Agyekum Kufuor (since January 7, 2001)

Vice-President: Alhaji Aliu Mahama (since January 7, 2001)

Capital: Accra

Area: 238.537 km²

Population: 22.409.572 (estimate 2006)

GDP (PPP) 2006 estimate

- Total: \$60 billion (75th)
- Per capita: \$2,700 (136th)

1.0 Introduction

Ghana has abundant renewable energy resources, such as solar, wind, biomass and mini-hydro, which have so far been under-utilized. Traditional biomass (wood fuels, firewood and charcoal) dominates the energy balance in Ghana and accounts for 66.7% of the total energy consumed. 25 to 28 million cubic metres of wood are consumed as fuel annually, followed by crude oil and petroleum products (26.2%) and electricity (7.1%). Ghana's electricity supply is mainly produced from hydro (two electric power plants) and thermal sources. These are supplemented with imports from neighbouring Cote d'Ivoire for domestic supply especially during peak hours. In order to promote the utilization of renewable energy sources the development of a legislative framework is necessary.

2.0 Bio-Energy Policies, Projects and Initiatives

In Ghana there is presently no policy or regulatory framework or related strategy in the field of promotion and development of bio-energy. A draft national biofuel policy has currently been submitted for parliamentary approval. However, there are many applicable laws and projects addressing environmental issues. The government of Ghana has proposed the enactment of a National Renewable Energy Law which includes biofuels and other renewable energy sources.

The government of Ghana supports both bio-energy and environmental projects. For example, the Ministry of Local Government, Rural Development and Environment organised a Jatropha Implementation Workshop in Mankessim in 2006. Participants included Metropolitan, Municipal, and District Chief Executives, District Agricultural Directors, Youth and Employment Coordinators and Rural Bank Managers.

The International Energy Agency (IEA) has estimated that use of traditional energy in Ghana grew by 2.1% between 2002 and 2003 (IEA 2003). According to FAO projections biomass production will increase at average annual growth rates of 2.8%, 2.2% and 1.8% during the periods 2003-2010, 2010-2020, and 2020-2030, respectively.

The available plants suitable for the production biofuels in Ghana include oil palm, coconut, groundnut, shea nut, Jatropha, sugarcane, and cassava. Today, Ghana places emphasis on the development of Jatropha as feedstock for biodiesel production.

Ghana has an adequate climate for *Jatropha* plantations, and the government has developed a plan for its production. Cost estimates for growing *Jatropha* and producing biodiesel in Ghana are currently not available, but compared with the cost of biodiesel from *Jatropha* in India by the Centre of *Jatropha* Promotion (CJP) in 2005, the production costs of biodiesel from *Jatropha* in Ghana is estimated at 460 dollars per ton of oil equivalent (i.e. 8% higher than the price of imported fossil diesel).

2.1 Government Funds for the Development of *Jatropha*

The Republic of Ghana stimulates the development of a local biofuel industry and supports a series of small-scale initiatives.

The government of Ghana has created a fund of 15 billion Cedis (1.6 million US\$) for the development of *Jatropha Curcas* plantations across the country. Some three billion Cedis (320,000 US\$) have been allocated to the production of seeds and seedlings, and the remaining 12 billion Cedis (1,280,000 US\$) are available at banks for organisations interested in the cultivation of *Jatropha*.

In 2006 quality seeds were available for the cultivation of about 2,500 hectares of land and the government gave the assurance that by 2007 seeds are available to cultivate 5,000 hectares of land.

Community Based Rural Development Projects (CBRDP) make available a 5 million US\$ fund managed by the Natural Resources Management component of the CBRDP. This fund addresses the rehabilitation of degraded ecosystems, thereby providing opportunities also for *Jatropha* projects due to their positive impact on soil erosion.

2.2 *Jatropha* Biodiesel Projects and Initiatives

The company Anuanom Industrial Projects from Ghana proposes the exploitation of *Jatropha Curcas* in Ghana on commercial scale to produce biodiesel as well as organic fertilizer from the press-cake and the fruit compost. The government of Ghana has already given its agreement for the implementation of the project. As *Jatropha* is native to Ghana, there are sufficient seeds available locally for the establishment of plantations.

The Company Anuanom has installed a unit with a capacity of 500 tons for the processing of *Jatropha* seeds to biodiesel and equipment with 2000 tons capacity for the production of organic fertilizer in the central region of Ghana.

The *Jatropha* National Programme in Ghana requires the full participation of all districts and municipal chief executives and district directors of the Ministry of Food and Agriculture to ensure the success of the programme. The programme aims at the development of about 1 million hectares of *Jatropha* plantations in the next 5-6 years with the objective to achieve the following benefits:

- Biodiversity protection
- Soil conservation and erosion control
- Protection of water bodies
- Sustainable forest management

- Job creation through the maintenance of Jatropha farms and the reaping of physic nuts for sale, leading to the creation of wealth and the reduction of poverty in local communities
- Production of crude Jatropha oil and biodiesel to replace fossil diesel and avoid the emission of greenhouse gases (GHGs)
- Production of fertilizer to support local agriculture

Furthermore, the enterprise Biosavanna Energy System, established in 2006, is dedicated to the production of biofuel from oilseeds including Jatropha Curcas. This enterprise utilises vast stretches of land with adverse agro-climatic conditions in the Savannah regions of Ghana for the large scale cultivation of Jatropha Curcas. In the initial plantation phase, 2000 ha were covered with Jatropha plants in the Central Province of Ghana and an expansion to 5000 ha is planned for the next 5 years.

Finally, the company Bio-Diesel 1 Ghana Limited operates a Jatropha oil production facility with a capacity of 2000 tons of seeds per month in Accra, and the private engineering enterprise Ghana Regional Appropriate Technology Industrial Services (GRATIS) is engaged in the manufacturing of machinery for the extraction of oil from Jatropha seeds. GRATIS currently produces oil extraction machines with capacities of 5 tons per day and 2 tons per day. The current screw press oil expellers have efficiencies of about 30%, and GRATIS intends to improve the efficiency to about 35%.

2.3 DANIDA Renewable Energy Development Programme

From 1998 to 2000 the Danish International Development Agency (DANIDA) implemented a renewable energy development programme in Ghana. This programme covered many projects in the fields of biomass and solar energy with the aim to determine technologically feasible and cost effective solutions for optimising the use of existing resources. This DANIDA programme was based on the following objectives:

- To conserve forest resources through improved methods of charcoal and firewood production
- To decrease consumption of firewood and charcoal by using more efficient cooking devices
- To expand the productivity and use of existing bio-energy resources such as production of charcoal briquettes from logging and wood processing residues
- To examine the use of animal and human wastes to generate biogas for cooking, lighting and electricity
- To plan the future security of biomass supply through the implementation of sustained programmes of forest regeneration and afforestation, especially in areas where intense charcoal production activities have destroyed the land and created environmental and ecological problems.

3.0 Legislation and Regulation relevant to Bio-Energy

3.1 Environmental Policies

Ghana signed the United Nations Framework for Climate Change in 1992 and ratified it in 1995. It subsequently acceded to the Kyoto Protocol in 2002 and has been participating in sub-regional, regional and international fora to discuss issues of sustainable development.

According to Act 1994, the Environmental Protection Agency (EPA) provides the framework legislation for environmental assessments in Ghana. The EPA has the following functions:

- To advise the Minister on formulation of policies on all aspects of the environment and in particular make recommendations for the protection of the environment;
- To co-ordinate the activities of bodies concerned with the technical or practical aspects of the environment and serve as a channel of communication between such bodies and the Ministry.
- To conduct investigations into environmental issues and advise the Minister thereon.
- To develop a comprehensive database on the environment and environmental protection for the information of the public.
- To conduct seminars and training programmes and gather and publish reports and information relating to the environment.
- To co-ordinate with international agencies.

3.2 Energy Policies

Until today, a specific legal and regulatory framework for the biofuel industry has not been developed.

The first effort to prepare an overall framework for the development of the energy sector in Ghana was undertaken by the Energy Board in 1990.

In 2000, the government introduced a policy document entitled: "Energy for Poverty Alleviation and Economic Growth: Policy Framework, Programmes and Projects". Pursuant to this document, the energy policies in Ghana are shaped by the vision to develop an energy economy that ensures reliable supply of high quality energy services for all sectors.

In this context the following policy objectives to provide the framework for the development and the implementation of energy programmes and projects are:

- To consolidate and improve existing energy supply systems
- To secure future energy supply
- To stimulate economic development
- To minimize environmental impacts of energy supply and consumption
- Special concerns include Renewable Energy Technologies (RET) and reforms of the energy sector.

The energy system in Ghana is mainly managed by the public sector with the involvement of the following public institutions:

- Ministry of Energy (MOE), for energy policy formulation
- Energy Commission (EC), for energy policy advisory, planning, regulation and monitoring activities
- Public Utility Regulatory Commission (PURC), for setting tariffs and service regulations
- Volta River Authority (VRA), for electricity generation and transmission. VRA supplies electricity to large industrial and mining units and two electricity distribution companies: EGG and NED.
- Electricity Company of Ghana Limited (ECG), for electricity distribution in the south sector
- Nord Electricity Department (NED), for electricity distribution in the north sector.

In addition, the Energy Foundation undertakes promotional activities in the areas of energy conservation, efficiency and renewable energy technology applications.

3.3 Agriculture Policies

The following objectives are guiding the current development of agricultural policies in Ghana:

- To establish a robust, diversified and commercially based agricultural sector that ensures food security, supplies adequate raw materials to industry, contributes to export earnings and provides producers with incomes comparable to earnings outside agriculture.
- To promote the modernization of agriculture to encourage rural development in order to achieve long-term growth.
- To ensure effective and efficient export diversification by making the agricultural sector more price competitive and export-oriented.
- To promote and facilitate the development of an agro-business industry.
- To strengthen the development, application and transfer of agro-based technologies, both soft and hard, to support sustainable agriculture production.

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