

COMPETENCE PLATFORM ON ENERGY CROPS AND AGROFORESTRY SYSTEMS IN AFRICA – OBJECTIVES AND RESULTS

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ABSTRACT: As global fossil energy resources become constrained, bioenergy is emerging as a major potential resource to supply the energy services currently provided by these fossil fuels. Africa and Latin America have, in theory, very large areas of land resources 'available' for bioenergy production. However, the production of biomass for energy on the scales necessary to supply significant shares of national and global energy provision, will result in very substantial impacts (positive and negative) on the ecosystems and cultures of these target regions. The protection of biodiversity, rural livelihoods and management of scarce water resources are critical considerations in any analysis of the potential for sustainable bioenergy provision.

The objective of this Competence Platform on Energy Crop and Agroforestry Systems - Africa (COMPETE) is to stimulate sustainable bioenergy implementation in Africa. COMPETE will establish a platform for policy dialogue and capacity building in the major multi- and bi-lateral funding organisations and key stakeholders throughout the bioenergy provision and supply chains.

Keywords: developing countries, bio-energy policy, energy crops, liquid biofuels, sustainable use of biomass

1 INTRODUCTION

At the beginning of the 21st Century, Africa contains some of the poorest and most technologically backward regions in the world, with civil conflicts, diseases, droughts further exacerbating the lives of the poor. Over the previous decades their quality of life has continued declining, and currently about 52% of the sub-Saharan Africans live on less than US\$ 1 per day and about 43% of the urban residents have incomes below US\$ 47 per person-month [1]. The poor economic performance and the shortage of work does not allow for a level of income that is sufficient for obtaining modern, clean, energy supplies. Hence, about 80% of the African population is still dependant on charcoal and firewood to fulfil their energy needs [2].

According to the World Energy Council (WEC) [3], the Food and Agriculture Organization (FAO) [4] and the UNDP [5], it is likely, that traditional biomass will be the main energy source for the sub-Saharan population for the foreseeable future, with demand continuing to grow. This trend in development will impose additional pressures on natural resources, particularly on the vulnerable arid and semi-arid ecosystems of Africa. Poor individuals can remain trapped in a cycle of increasingly unsustainable dependence on declining local resources. For the majority, the only known agricultural methods are the traditional ones, which, without sufficient inputs, can

cause soil degradation and desertification and have already led to overuse, with a regional decline in available biomass.

Modern, locally adapted, wisely implemented and planned, bioenergy systems may provide one such option. Today, at least 16% of the world's agricultural land, especially cropland and pastures in Africa, already show a significant decline in productivity and about 65% of the cropland and pastures of Africa are degraded. Traditional agricultural methods are not able to cope with increased pressures caused by climate change.

A number of studies have estimated the resource base for the supply of biomass for energy highlighting the large areas of 'unused potential agricultural land' in Africa (750 Mha) and Latin/South America (850 Mha) [6]. Smeets and Faaij predicted for Africa that between 41 and 410 EJ of energy could come from biomass by 2050, with the upper estimate equivalent to current total global primary energy consumption [7]. A further 46 to 310 EJ could be provided from South America once food and other land uses had been accounted for.

At the same time as this huge potential for modern bioenergy is being highlighted, the health and environmental consequences of expanded and uncontrolled use of traditional biomass fuels is increasingly being associated with health and drudgery problems that disproportionately affect women and children in the poor areas of developing countries [8].

Finally, the increased cost of the fossil fuel alternatives to traditional biomass use for energy means that those that had switched to cleaner, less demanding alternatives to traditional fuels are now being forced back into using them because these alternatives may no longer be affordable.

2 THE COMPETE PROJECT

2.1 COMPETE objectives

The objective of the Competence Platform on Energy Crop and Agroforestry Systems for Arid and Semi-arid Ecosystems - Africa (COMPETE) is to stimulate sustainable bioenergy implementation in Africa [9,10]. COMPETE will establish a platform for policy dialogue and capacity building in the major multi- and bi-lateral funding organisations and key stakeholders throughout the bioenergy provision and supply chains. The COMPETE project is co-funded by the European Commission in the 6th Framework Programme – Specific Measures in Support of International Cooperation for the period January 2007 until December 2009 [11,12].

COMPETE will carry out a comprehensive, multi-disciplinary, assessment of current land use, energy demand and technology innovation focused on Africa to identify pathways for the sustainable provision of bioenergy, which will:

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

2.2 COMPETE activities

COMPETE will deliver a matrix of multi-disciplinary and cross-sectoral work-packages, each led by globally recognised scientists and implementers, to:

- provide an evaluation of current and future potential for the sustainable provision of bioenergy in Africa in comparison with existing land use patterns and technologies
- facilitate South-South technology and information exchange capitalising the world-leading RD&D in bioenergy in the key countries Brazil, Mexico, India, China and Thailand
- develop innovative tools for the provision of financing for national bioenergy programmes and local bioenergy projects, including: carbon credits, bilateral and multi-lateral funding instruments, and the role of international trade
- develop practical, targeted and efficient policy mechanisms for the development of bioenergy systems that enhance local value-added, assist local communities and address gender inequalities
- establish the Competence Platform to ensure effective dissemination and knowledge exchange inside and outside the network

2.3 COMPETE partnership

The COMPETE partnership comprises 20 European and 23 non-European partners - 11 partners from 7 African countries, 3 regional African policy and financing bodies (African Development Bank; Food, Agriculture and Natural Resources Policy Analysis Network of Southern Africa; UEMOA - Biomass Energy Regional Program), 9 partners from Latin America and Asia - and the Food and Agriculture Organisation of the United Nations (FAO).

Detailed information on COMPETE project partners is available at the website www.compete-bioafrica.net.

2.4 COMPETE dissemination activities

COMPETE dissemination activities aim to actively promote the exchanges between the COMPETE working groups and to effectively link with existing networks and a large variety of stakeholders, target groups and key actors. The following dissemination activities have been performed:

- Creation of the COMPETE logo
- Creation of the COMPETE website www.compete-bioafrica.net
- Development of the COMPETE stakeholder database (Associate Membership)
- Publication of project newsletters
- Elaboration of scientific publications and a COMPETE project presentation flyer
- Close co-operation with a variety of national and international events and initiatives
- Contribution to the First High-level Biofuels Seminar in Africa in Addis Ababa, Ethiopia, organised by the African Union Commission (AUC), the Government of Brazil and the United Nations Industrial Development Organisation (UNIDO) on 30 July – 1 August 2007
- Organisation of the COMPETE International Workshop 'Improved Energy Crop and Agroforestry Systems for Sustainable Development in Africa' in Mauritius on 22 June 2007
- Organisation of COMPETE Round Tables on the occasion of the 'International Conference: Stakes and Perspectives of Biofuels for Africa' in Ouagadougou, Burkina Faso on 27-29 November 2007
- Organisation of a COMPETE seminar and field trip to Brazil on 22-26 October 2007
- Organisation of a COMPETE seminar and field trip to India on 4-8 February 2008



Figure 1: COMPETE logo

3 COMPETE PROJECT RESULTS

In section 3 of this paper results of COMPETE project activities are presented in the fields of ‘current land use’, ‘improved land use’, ‘sustainability analysis’, ‘South-South cooperation’, ‘financing’ and ‘policy development’.

3.1 Current land use patterns in Africa

Within the COMPETE work on ‘current land use’, the principal objective was to identify land in the semi arid and arid regions of sub-Saharan Africa where intensification of or conversion to bioenergy use, will not have detrimental environmental and/or socio-economic impacts. A wide range of Geographic Information System (GIS) data sets, FAO statistics and literature sources that categorise spatial and temporal variations in Africa’s biophysiological parameters and anthropogenic activities were acquired, analyzed, manipulated and synthesized. As a precaution against detrimental impacts on biodiversity, all categories of protected areas, closed canopy forests and wetlands were excluded. Likewise to safeguard food security, all areas under food and/or cash crop (herbaceous and woody) production were excluded. Areas unsuitable because of severe water, terrain and soil constraints were also excluded. Figure 2 shows unsuitable/unavailable areas for Bioenergy crops in sub-Saharan’s arid/semi-arid regions.

The main results were presented in two series of maps [13]. The first uses all the continent’s country boundaries and the delineated semi arid and arid regions as a template on which available and suitable areas for bioenergy crop production, primary roads, primary railroads and populated places are sequentially shown. Case studies have been made of the following countries: South Africa, Botswana, Zambia, Tanzania, Kenya, Mali, Burkina Faso and Senegal. Each has several different

bioenergy initiatives and COMPETE partner representation. The second set of maps uses the semi arid and arid regions of each of these countries in turn as a template on which available and suitable areas for bioenergy crop production, roads, railroads, rivers and populated places are sequentially shown and variously labeled. The specific habitat requirements of various bioenergy crops needs to be evaluated to identify the best potential candidates in different parts of each country. Other partners of this work package will now determine (a) if the land identified in these maps is free from legal, cultural and policy constraints against utilization for bioenergy, and (b) if the water resources, potential labour markets and infrastructure can sustain conversion of this land to bioenergy production.

In order to evaluate whether more intensive and extensive bioenergy use will have detrimental impacts on rural livelihoods and on those of the peri-urban and urban poor, an inventory of basic statistics of existing bioenergy use in the case study countries was compiled. Preliminary results indicate that (i) traditional use of wood, agricultural residues and animal wastes is not sustainable over very substantial areas in each of the study countries and is having serious detrimental environmental and socio-economic consequences; (ii) more sustainable harvesting options, replanting, agroforestry, more efficient charcoal making kilns and household stoves are being widely promoted and adopted but are primarily constrained by cost factors; (iii) large scale commercial use of human waste is in its infancy; and (iv) the livelihoods of a very substantial number of people are totally dependent on supplying fuelwood and more particularly charcoal to peri-urban and urban households. The availability of cheap electricity from bioenergy crops could have a detrimental impact on this “industry”, if its fruition came about very rapidly.

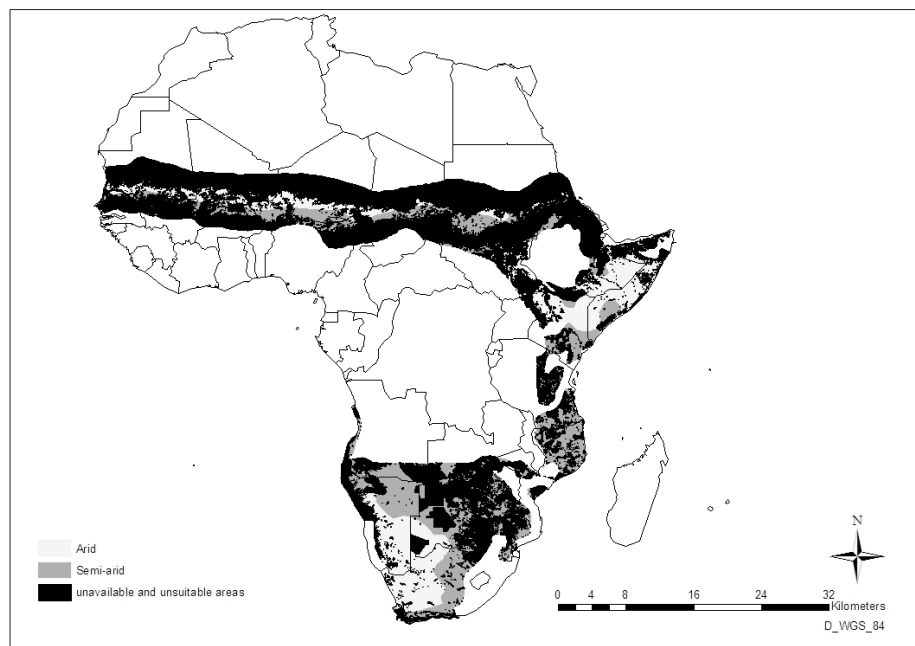


Figure 2: Unsuitable/unavailable areas for Bioenergy crops in sub-Saharan’s arid/semi-arid regions

3.2 Improved land use – energy crops and agroforestry systems

Within COMPETE activities on ‘improved land use’, an overview of agricultural production systems and bio-energy systems has been prepared. In this context a comparative research was performed on the socio-economic impact of different improved bioenergy systems in Tanzania.

Furthermore, ‘improved land use’ issues were addressed in the framework of two round tables on the occasion of the ‘International Conference: Stakes and Perspectives of Biofuels for Africa’ in Ouagadougou, Burkina Faso on 27-29 November 2007.

The First Round Table ‘Biofuels for transport versus electricity production’ dealt with the question which biomass production and utilisation systems are favourable under different conditions. The following conclusions and recommendations were elaborated:

- The production of transport biofuels has the potential to reduce the burden of high and increasing oil prices in several African countries. Priority should be given to meeting local demand over export.
- Additionally, biofuels can be used as efficient source of household energy, reducing the negative impact of Indoor Air Pollution and the stress on diminishing wood fuel resources.
- Advantages of biofuel use for small scale rural electrification projects are the comparatively low level of investment and the integration of biofuel production in existing agricultural structures.
- Biofuel based rural electrification projects can be the best practical and cost effective approach to provide access to electricity in remote regions in community driven initiatives.
- Large scale initiatives for the production of biofuels for transport need to carefully take into account the issues of land tenure, food versus fuel competition and sufficient local revenue generation.
- Biofuels can lead to the mobilisation of investment in the agricultural sector of African countries, thereby improving the production of both food and fuel through integration and efficiency gains.
- Domestic use of transport biofuels requires the development of suitable legislation and regulations (e.g. quality standards, blending requirements).
- Export from African countries should focus on processed biofuels rather than the raw material (feedstock) for national revenue generation.
- The appropriate use of biofuels is influenced by a large variety of factors such as land availability and quality, land tenure, climatic conditions, available infrastructure, logistics as well as the development of local, regional, national and international markets.
- African countries need to elaborate national and sub-regional biomass development plans in order to identify the best possible use of biomass/biofuels.

The second Round Table discussed the ‘Competition between non-food and food uses: stakes and risks’ for different potential implementation strategies of bioenergy production in Africa. The following conclusions and recommendations were drawn:

- The current developments in the bioenergy field in Africa are fast, driven among others by developments in industrialized countries. Risks of food insecurity as well as the potential for increasing agricultural productivity and food security are both inherent to the development of the bioenergy sector in Africa. Therefore, addressing the relation between food security and bioenergy is urgent and should be started immediately.
- Policies and regulations to ensure food security while developing bioenergy are needed. These regulations should comprise among others: agriculture, energy security, working conditions, economic development and environmental impacts.
- Research on the specific situation in a country or region for specific biomass supply chains is needed before implementing bioenergy programmes. This should include a detailed analysis on the local level (e.g. land use, suitability of soils, social conditions etc.). The positive and negative experiences in the production of cash crops in Africa should be taken into account while developing sustainable biomass production schemes.

3.3 Sustainability analysis of alternative land use

The 2007 Addis Ababa Declaration that emanated from *The First High-level Biofuels Seminar in Africa* on 30 July to 1 August (see section 4.1) committed the continent to sustainable bioenergy development. This moves forward the objective of COMPETE activities on ‘sustainability analysis’ to assess the ecological, economic and social sustainability of alternative land use for energy crop and agroforestry schemes as well as to identify practical mechanisms for defining, monitoring and rewarding good sustainability practice.

A survey on sustainability criteria was performed to explore how relevant are sustainability criteria in the African context. This was the result of the conclusions of different meetings and conferences attended by the partners in Africa where, besides the Addis Ababa declaration, several African participants did not show large interest in the topic or considered it as a drawback to the development of biofuels industry in the continent.

Finally, in order to emphasize the importance of a sustainable bioenergy development in Africa, an International COMPETE Conference and Policy Debate on ‘Biofuels Sustainability Schemes - An African Perspective’ was organised on 16-18 June 2008 in Arusha, Tanzania. The final result of this conference will be a COMPETE declaration on sustainable bioenergy which will provide input to the on-going discussion on sustainability schemes in Europe and on a global scale [14].

3.4 South-South cooperation

In the framework of COMPETE activities on South-South cooperation two technical field visits were organised to Brazil in October 2007 and India in February 2008.

The number of participants of the field visit to Brazil was 23 including COMPETE partners and a group of COMPETE associate members supported by the UN Division for Sustainable Development (UN-DSD). The COMPETE event in Brazil was opened with a one-day meeting in São Paulo and included the launch of a fleet of bioethanol buses in the framework of the EC funded project BEST (Bioethanol for Sustainable Transport) at the University of São Paulo [15] as well as technical visits to the following companies active in the field of bioenergy in Brazil: *Dedini Industrias de Base*, Piracicaba, an industrial equipment manufacturer for ethanol and biodiesel plants; *Santo Antonio Mill* at Sertãozinho, a sugar mill and distillery for bioethanol; *TGM Manufacturers* at Sertãozinho a manufacturer for steam turbines, pumps and gear units; and finally, *Bertin Biodiesel Factory* at Lins, a biodiesel plant built by the Bertin Group with an annual output of 100,000 tons of biodiesel [16].

The field visit to India was organized by the COMPETE partner Winrock International India (WII) in cooperation with WIP Renewable Energies, Germany. The programme of the field visit included visits to the major equipment manufacturers *PRAJ Industries* and *THERMAX Ltd.* active in the fields of biofuel production technologies as well as boiler technologies for biomass based co-generation, as well as to the Ranidhera Rural Electrification Project based on the use of straight *Jatropha* oil. Furthermore, guided tours to several *Jatropha* plantations and a small-scale biodiesel production facility were organized. The group included 17 representatives from COMPETE partner organizations as well as 7 representatives from COMPETE Associate Partners. 11 participants came from the African countries Burkina Faso, Ethiopia, Ghana, Kenya, Senegal, South Africa, Tanzania and Zambia, and two participants from Mexico and Brazil [17].

Furthermore, COMPETE activities on South-South cooperation included best practice reports on agroforestry systems and energy crops for Mexico [18] and India [19].

Visits were undertaken to the Nodal Centres of Agroforestry for the arid and semi arid regions in India presented in Figure 3. The Directors of the Arid Forest Research Institute (AFRI) and Central Arid Zone Research Institutes (CAZRI) and School of Desert Sciences were contacted. The potential of *Calligonum polygonoides* (Phog) and indigenous plant species largely used as a fuel wood with high calorific value as energy plantation is being investigated. The energy plantations undertaken by the Gujarat Energy Development Agency (GEDA) in Lathedi village in Kach district of Gujarat in India is being studied.

Preliminary information on success and failures of the introduction of exotic species in India was collected. The project is presently analyzing the success of *Ailanthus excelsa*, *Poplar* and *Casurina* in the region. The advances made in the field of plantations of species such as *Jatropha curcas* and *Pongamia* are presently studied. Interactions were held with officials of the Ministry of Environment and Forests (MoEF), the Government of India and the Department of Forests, and the Govt. of Rajasthan on the rather slow implementation of UNCCD (United Nations Convention on Combating Desertification in India), which also looks at the energy requirements of the region.

Finally, a biofuel policy for India will be in place soon and it is worthwhile to examine the emerging policy guidelines for intensive energy plantations in the states lying in arid and semi arid regions. Although domestic legislations are currently under preparation, an international convention that can boost promotion of energy plantations is the UNCCD to which India is a signatory. The Convention is strengthening the livelihood capita of the Thar Desert. Plantations have been undertaken around traditional rainwater harvesting systems to protect against sand filling. Improved livelihoods act as an adaptation to random recurrence of draught and conserve desert biodiversity. Efforts are made to stabilize sand dunes to enhance farmland productivity, secure water yield and biodiversity restoration. Combating desertification plantations (CDP) (special watersheds) have been undertaken in 10 districts in Rajasthan. During the period 2002 to 2007, a total of 166,263 ha plantation were carried out with a survival rate of 80 - 85%.

Finally, COMPETE activities in the field of international cooperation also include the promotion of knowledge transfer and joint ventures on modern bioenergy technologies for applications in African countries [20].



Figure 3: Arid and semi arid zones in India

3.5 Financing of alternative land use

The main objective of COMPETE activities on 'financing' is to develop innovative tools for the provision of financing for national bioenergy programmes and local bioenergy projects, including: carbon credits, bilateral and multi-lateral funding instruments, and the role of international trade. COMPETE will collate and analyse information on four categories of bioenergy sources: biodiesel crops, bioethanol crops, woody or solid bio-energy for fuel switching in industry, and agroforestry. As information on the first two categories is much more readily available the results presented in this paper will focus on biofuels [21].

Inherent barriers associated with financing energy crop cultivation in Africa are centred around the high risk associated with low and unpredictable land fertility and water availability. This is especially relevant in the arid and semi-arid areas that are the focus of the COMPETE project. Additionally, financial sector shortcomings, such as lack of funds, lack of sector know-how and willingness to invest in bioenergy programmes, as well as political barriers and poor infrastructure have meant that bioenergy financing mechanisms in Africa have been relatively ineffective to date.

The biofuels industry is one of the fastest growing energy industries in the world, seeing a 17.6% increase worldwide in 2006 and becoming the 3rd fastest growing renewable energy sector. Production has been skewed towards South America especially Brazil, Columbia, Guatemala and Peru. In Africa, there are a number of energy crop ventures, but not on the same scale as in South America. Development has been hindered by the high capital costs and risks associated with projects.

The COMPETE work concludes that the most relevant financing sources for energy crops- and agroforestry-based developments in these regions are smart subsidies, corporate financing (FDI), R&D funds, joint venture partnerships, carbon credit financing and (if packaging the projects to international standards is possible) funding from mechanisms such as the GEF, the African Rural Enterprise Development (AREED, which operates in Mali, Ghana, Tanzania, Senegal and Zambia) or the Community Development Carbon Fund (CDCF, which can consider purchasing carbon from a variety of land use and forestry projects).

Furthermore, it is crucial to integrate financial risk management instruments into any holistic financing strategy for energy crops and agroforestry-based developments. Getting political approval for using soft credits from donors to co-finance energy crop/agroforestry projects seems a realistic option. Wherever possible, local farmers in rural areas of arid and semi-arid Africa should be included in the process.

3.6 Policy development

Having supportive policies in place is a critical necessity for African countries to benefit from, and to avoid being seriously harmed by biofuel development. An assessment of current policies was carried out at national, regional and international levels reviewing a wide range of policy documents related to energy, natural resources, agriculture, trade, and poverty reduction [22, 23]. It was found that in general, few African countries (with the exception of South Africa) have policies in place that would enable them to benefit substantially from the new opportunities for producing and either consuming locally, or exporting, bioenergy products.

Even those countries with some policies in place have done little to implement these policies. The Economic Community of West African States (ECOWAS) has a broad policy though there is little progress in implementation, while none of the other African Regional Economic Communities (REC) have policies in place. In contrast, the United States and European Union are both using subsidies and other means to support increasing the production of biofuels internally, but are not necessarily open to major imports from developing countries. Furthermore, WTO rules are

ambiguous about the classification of biofuels, which is retarding progress on international biofuels trade.

African countries and RECs urgently need to engage in biofuel development. Some countries are well-placed to take advantage of the opportunities for enhancing growth through growing and processing biofuels. Other countries may find their food security threatened by diversion of food crops and land to biofuels, and both these countries and the global community need to address this potential threat.

With the growing interest in biofuels worldwide, there is need for national governments in Sub-Saharan Africa to develop mechanisms for harnessing the potential of the fast growing industry and benefit from the growing international trade in biofuels while at the same time protect the environment and rural communities from being disadvantaged by large-scale cultivation of energy crops for biofuel production. Specifically, the COMPETE project urges the national governments in sub-Saharan Africa:

- to develop comprehensive national biofuels policies and plans in consultation with stakeholders including regional economic communities (RECs) such as SADC, ECOWAS, and COMESA, and with AU/NEPAD that also include the incentives for private sector participation in the biofuel industry,
- to raise the resources for infrastructural development for production, processing, storage, transporting and marketing of biofuel products,
- to commit resources for research and development (R&D), capacity-building and technical support, and
- to establish a regulatory and institutional framework to regulate and provide incentives for development and growth of the biofuel industry.

During year 2006, the Union Economique et Monétaire Ouest Africaine (UEMOA) through its Biomass Energy Regional Programme (PRBE) organised a feasibility study outlining the market opportunities, supply chain and the technological and economical benefits for promoting liquid biofuels in 8 West African countries (Benin, Burkina Faso, Guinee Bissau, Ivory Cost, Mali, Niger, Senegal, Togo) [24].

From a regional point of view, the agricultural production potential for the ethanol sector is very consistent with (i) the humid areas of Ivory Cost, Guinee Bissau, Benin and Togo where rain fed sugar cane, cassava and cashew tree are cultivated and (ii) the geographical zones around the Niger, Senegal and Gambia rivers with intensive irrigation of sugar cane and rain fed oils seeds such as cotton, jatropha and ricin. A co-operation with sub-regional organisations charged with the development of these Sahel zones would enable setting projects in motion.

With the exception of Benin and Guinea-Bissau the local production of anhydrous ethanol can compete with gasoline. Feasibility in Benin suffers especially from illegal import of hydrocarbons from Nigeria while production costs in Guinea-Bissau are high due to high raw material costs and low capacity utilisation as a result of the limited seasonal availability of cashew apple. In these countries, modest support measures (for example tax exemptions) could render the production of anhydrous ethanol viable. On the other hand the

production of anhydrous ethanol as fuel substitute for imported hydrocarbons should be especially stimulated in Ivory Coast, Senegal, Mali, Burkina Faso. These countries with important resources can save on the import of hydrocarbons, especially by developing local resources. Regarding the production of biodiesel in Niger and Togo, preliminary calculations indicate that this fuel can compete with fossil diesel. Biodiesel production costs are 5 to 11% less than those of diesel. These costs are highly sensitive to the price of jatropha seeds.

The principal recommendation is to continue the development of a biofuel sector in the UEMOA region. The potential to produce anhydrous ethanol and/or biodiesel starting from local raw materials is existing and promising in all the Member States. However, a strong will to reform the hydrocarbons sector and to take inciting measures enabling investments is necessary.

4 COMPETETE COMPETENCE PLATFORM

The COMPETE project internet platform was created under www.compete-bioafrica.net and launched on the occasion of the project kick-off meeting in March 2007. The system gives users of the Internet worldwide access to information and latest news from the project through a user-friendly interface. The web page includes information about the project, the composition of the project consortium, latest news from the project, information about events, a publication archive, and a list of relevant web links.

A Stakeholder Database is embedded into the project website to form the basis of an information network of organisations and institutions engaged in all aspects of improved energy crop and agroforestry system development. This COMPETE Stakeholder Database was established through the set-up of a COMPETE Associate Partnership.

Furthermore, two issues of the COMPETE project newsletter have been produced bi-lingual (in English and French) in order to enhance the cooperation between West, East and Southern Africa and circulated to project partners and a large variety of stakeholders. The newsletter issues are available in hardcopy and as downloads on the project website.

In the following, two specific dedicated COMPETE dissemination activities are summarised.

4.1 COMPETE Participation at The First High-level Biofuels Seminar in Africa

From 30 July – 1 August 2007 the African Union Commission (AUC), the Government of Brazil and the United Nations Industrial Development Organisation (UNIDO) jointly organized The First High-level Biofuels Seminar in Africa in Addis Ababa, Ethiopia, under the theme 'Sustainable Bio-fuels Development in Africa'.

In order to facilitate the elaboration of viable policies and strategies for the development of the African biofuels sector, the High-level Biofuels Seminar had the following main objectives:

- Briefing of policy makers, the private sector, regional institutions and other key stakeholders on the potential and risks and trade-offs of developing biofuels in Africa

- Sharing of experiences in developing biofuels among countries in Africa and between Africa and Brazil and other countries and regions
- Consulting of key stakeholders in developing a programme of action for sustainable biofuels development

Based on the large experience of the COMPETE partnership on land use for energy crop production, technologies for the production of various biofuels, sustainability criteria for biofuels, as well as on the exploitation of South-South cooperation in the field of biofuels, a close cooperation was established between the COMPETE project and the organizers of the High-level Biofuels Seminar.

The COMPETE project actively supported the High-level Biofuels Seminar through the participation of COMPETE members as speakers, experts and session chairs.

Prof. Francis Yamba, CEEEZ, Zambia, gave an introductory presentation on the COMPETE project highlighting the following COMPETE policy recommendations for the development of biofuel programmes in Africa.

1) *Implementation of National Biofuel Strategies*

African Governments should formulate strategies aimed at addressing critical issues such as to promote local demand for biofuels as a share of the fossil fuel market, determine blending ratios, establish biofuel standards, recommend production modalities, consider environmental and social concerns, and provide appropriate incentives.

2) *Establishment of Legal and Regulatory Frameworks*

African Governments should set up legal and regulatory frameworks aimed at guiding and regulating the biofuel industry and enforcing sustainable use of land and resources to avoid negative environmental impacts of the biofuel industry.

3) *Promotion of Integrated Agro-industry Farming Policies*

African Governments should take into account the interrelation of biofuel industries with livestock, farming, fisheries, and the conservation of forests and watershed areas to ensure maximised national benefits and sustainable development. This integrated approach is important for coherent and sustainable water and land management in African countries.

4) *Support of Biofuel Research*

African Governments should support local and regional research into suitable feedstock, process and logistics optimisation, economic analysis for cost effective solutions, and the transfer of suitable biofuel technologies (including the conversion of ligno-cellulosic material).



Figure 4: COMPETE Participants at The First High-level Biofuels Seminar in Africa

Based on the plenary and thematic sessions and Ministerial Roundtable discussions of the First High-level Biofuels Seminar in Africa, the seminar participants agreed upon a set of recommendations laid down in The Addis Ababa Declaration on Sustainable Biofuels Development in Africa [25].

A concise summary report of The First High-level Biofuels Seminar in Africa published by the International Institute for Sustainable Development (IISD) is available at www.iisd.ca/africa/biofuels [26].

4.2 COMPETE Registered as Official Partnership of the UN CSD

The UN Commission on Sustainable Development (CSD) is a commission with high-level representatives from member countries of the UN established in 1992 after the United Nations Conference on Environment and Development (The Earth Summit) in Rio de Janeiro. The CSD monitors progress and reports on the implementation of sustainable development goals in its member countries, and its annual meetings in New York are dedicated to selected Priority Issues tackled in two-year cycles.

The Priority Issues of the CSD sessions in 2008-2009 address the topics *Agriculture, Rural Development, Land, Drought, Desertification and Africa*. As these Priority Issues are well in line with the objectives and activities of the COMPETE project, the COMPETE project decided to apply for a registration of COMPETE as an official Partnership for Sustainable Development at the CSD Secretariat.

The registration of COMPETE as Partnership for Sustainable Development was accepted in October 2007. Information on COMPETE is available at the CSD website www.un.org/esa/sustdev/partnerships/.

The 16th Session of the Commission on Sustainable Development (CSD-16) took place on 5-16 May 2008 at the UN Headquarters in New York. The COMPETE Partnership successfully contributed to the thematic priorities of CSD-16 through:

- Participation in the CSD-16 Partnerships Fair,
- Presentation of the partnership, and
- Partnership Information Desks

In the future a further involvement of COMPETE in CSD activities on agriculture and rural development in Africa will be ensured.

5 CONCLUSION

The Competence Platform on Energy Crop and Agroforestry Systems - Africa (COMPETE) has successfully established a platform for policy dialogue and capacity building in Africa involving key stakeholders throughout the bioenergy provision and supply chains. COMPETE thereby contributes to ensuring the sustainable exploitation of bioenergy resources in Africa through a detailed assessment of current and future potential for the sustainable provision of bioenergy in Africa in comparison with existing land use patterns and technologies.

Furthermore, COMPETE has facilitated South-South technology and information exchange through the organisation of study tours to Brazil and India.

Finally, COMPETE is strongly engaged in the promotion and development of practical, targeted and efficient policy mechanisms to ensure the implementation of socially, environmentally and economically sustainable bioenergy systems that enhance local value-added and contribute to sustainable development in African countries.

6 ACKNOWLEDGMENT

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The Technical Annexes of the COMPETE First Periodic Activity Report are all available at the project homepage <http://www.compete-bioafrica.net/>.