



BIOFUELS PRODUCTION FROM JATROPHA IN AFRICA



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MEDAN, INDONESIA

E.N.Sawe, TaTEDO, Tanzania.

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PRESENTATION OUTLINE



- ❖ AFRICA CONTINENT CONTEXT
- ❖ RATIONALE FOR BIODIESEL PRODUCTION IN AFRICA
- ❖ OVERVIEW OF LIQUID BIOFUELS IN AFRICA
- ❖ GLOBAL JATROPHA STATUS
- ❖ OPPORTUNITIES FOR *JATROPHA* PRODUCTION IN AFRICA
- ❖ *JATROPHA* DEVELOPMENT MODELS
- ❖ PROMOTE PROMISING GOOD PRACTICE MODEL
- ❖ FARMING PROCESSING AND USE OF *JATROPHA*
- ❖ THREATS FROM THE *JATROPHA* INDUSTRY
- ❖ RECOMMENDATIONS AND CONCLUSIONS
- ❖ ABOUT TaTEDO.

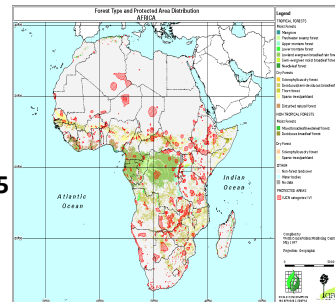
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AFRICAN CONTINENT CONTEXT



- ❖ **SIZE:** 30,221,532 sq. kms.
- ❖ **POPULATION:** 1,033,042,510 (14.95% of World population)
- ❖ **ARABLE LAND:** billion hectares whereby 630 million ha of land is suitable for cultivation
- ❖ **LAND IN USE:** less than 10 percent of the available.
- ❖ **FOREST COVER:** 650 million ha or 21.8 percent of the land area (16.8% of global).
- ❖ **BIODIESEL PRODUCTION AND CONSUMPTION:** insignificant
- ❖ **PETROLEUM PRODUCTS CONSUMPTION ;** About 5 million barrels a day or about 300 million litres a day.
- ❖ **RURAL ELECTRIFICATION:** less than 5 percent



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RATIONALE FOR BIODIESEL PRODUCTION IN AFRICA



Rationale for liquid *biofuels* production include the following;

- ❖ Petroleum products prices rise and are expected to remain high.
- ❖ Concern to global climate change need to reduce green house gases.
- ❖ Increased energy security and enhance rural development in Africa.
- ❖ Provide opportunities for farmers to grow new cash crops
- ❖ Politically unstable regions source of most oils, low reliability.
- ❖ Rapid growth in demand of petroleum products from other countries outside of Africa (India & China). Prices and reliability again an issue.

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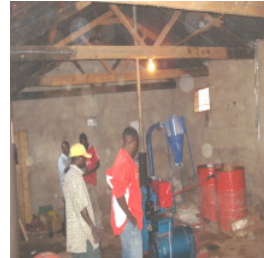


RATIONALE FOR BIODIESEL PRODUCTION IN AFRICA CONT'N...



Rationale for *biofuel production* include the following :-

- ❖ Replacement of traditional solid biofuels- reduce indoor air pollution.
- ❖ Use of SVO as fuel in stationary power plants to produce electricity for rural communities.
- ❖ Economic opportunities for smallholder farmers e.g by intercropping with other crops.
- ❖ Alternatives for non-oil producers countries.



Electricity Generated through ESP



Jatropha Intercropped with Banana

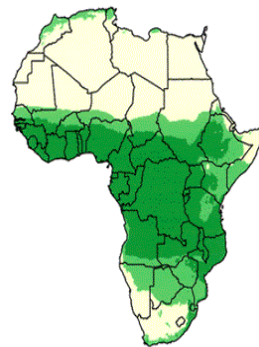
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OVERVIEW OF LIQUID BIOFUELS IN AFRICA



- ❖ Solid biofuels main sources of energy in African countries for cooking.
- ❖ Liquid biofuels, ethanol, biodiesel and SVO still account for small share of total energy supplies.
- ❖ Africa has a large potential for biofuels production due to large unused land and rural population
- ❖ Some countries produce ethanol, Malawi, Zimbabwe and Ethiopia.
- ❖ Also few countries produce small amount of SVO from *Jatropha*, mostly for local markets.
- ❖ Large scale production of biofuels in Africa is only beginning.
- ❖ Most African countries are now developing bio-energy policies and projects.



Potential areas in Africa for Biofuels

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OVERVIEW OF BIOFUELS IN AFRICA CONT'N...

- ❖ Different feedstock can be used to produce biofuels in Africa, those with greatest interest are sugar cane for Ethanol and Jatropha for SVO or biodiesel production.
- ❖ The focus of this presentation is on liquid *biofuels* production efforts from *Jatropha*.
- ❖ Only recently Jatropha is being used for biofuels production, otherwise has been used as farm hedges, soap production and medicinal purposes for many years in many African countries.
- ❖ Jatropha, like other biofuels crops offer an opportunity to African countries to produce new cash crops for domestic and export markets where policies and fair regulations are adequately enforced.



Jatropha Fruits



Jatropha as hedges

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GLOBAL JATROPHA STATUS

- ❖ In 2008, *Jatropha* was planted on an estimated 900,000 hectares globally, 760 000 ha in Asia, 120,000 ha in Africa, and 20,000 in Latin America.
- ❖ Subject to its performance, by 2015, it is estimated that the crop will be planted on 12.8 million ha, mostly in Africa.
- ❖ The largest producing countries in Asia are India and Indonesia.
- ❖ In Africa, Ghana, Madagascar, Mozambique, Tanzania and Mali are expected to be the largest producers, while Brazil and Mexico are expected to lead in Latin America.



Jatropha Farm in Kenya at Central Province

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JATROPHA DEVELOPMENT MODELS IN AFRICA

Different Jatropha production, processing and Marketing models are emerging in Africa, they include:-

- ❖ Stand alone Large scale plantations.
- ❖ Large scale plantations also contracting smallholders as out growers to produce seeds for the plantations owners.
- ❖ Contracted small scale farmers producing for private Organizations/ Companies without farms.
- ❖ Independent Small scale farmers some organized in associations/ cooperatives to locally produce, process and use oil for soap and energy production and sell extra oil or seeds to local biodiesel producing companies operating at the District or regional towns. Farmers cooperatives could have shares in such biodiesel Companies.

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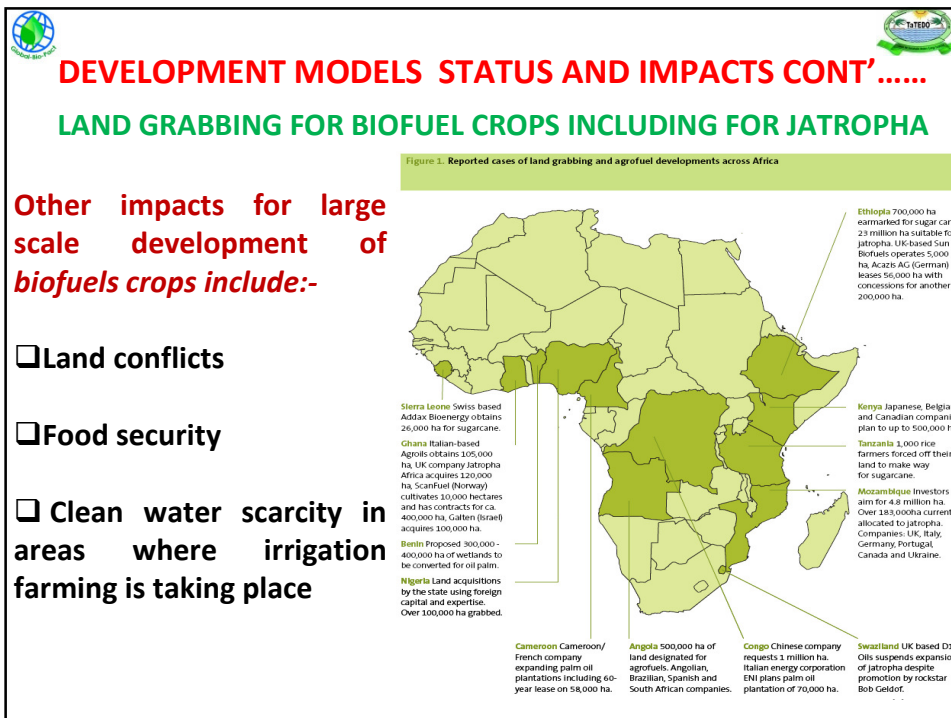
DEVELOPMENT MODELS STATUS AND IMPACTS

Large scale plantations/ business models

The Plantations/business model normally are capital intensive, often using tractors, a lot of fertilizers, pesticides, and, sometimes, expensive irrigation (and salaried labour) could have 100 ha or more of land.

- ☐ In Africa, most are established by foreign Companies with objective of producing Jatropha oil for export. Has least potential to enhance rural development although could support rural employment;
- ☐ Some Companies that have practiced this model have had financial problems due to several reasons i.e, financial crisis of the last few years, lack of adequate capital and due to a number of unknowns in Jatropha plant. This model is yet to proof successful in Africa.
- ☐ Despite low success, several countries in Africa are still giving large pieces of land to foreign companies to grow Jatropha.

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DEVELOPMENT MODELS STATUS AND IMPACTS CONT'

❖ **Large scale Plantation Contracting out growers: -**

- ☐ Large scale **Jatropha** plantations have agreement with smallholder farmers to provide inputs and technical support for **Jatropha** production and in turn the plantations, buy all the seeds from small scale farmers. The potential for positive socio-economic impacts depend on a number of issues including: the support and how fair the terms of contracts are.

❖ **Independent small scale farmers: -**

- ☐ Independent Small Scale farmers, some organized in associations or cooperatives to locally produce, process, use jatropha oil for soap and energy production. Under this model socio-economic impacts also depend on the management set up and price. **This model could be, the best option for smallholder farmers and for Africa if will be well organized and managed.**

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DEVELOPMENT MODELS STATUS AND IMPACTS CONT'.....



Independent small scale farmers ctn...:-

- ❖ Farmers associations and Cooperatives fit well with Jatropha production and processing. Associations/cooperatives have been successful, in several countries in and outside Africa.
- ❖ Promoted by supporting small holders to intercrop and grow Jatropha on farm hedges, provided with necessary inputs and extension services and then with appropriate technologies to process seeds for oil and other products production and marketing.
- ❖ Local Biodiesel Companies: To buy Jatropha from small holders cooperatives and processes it into biodiesel; it may have its own plantations and has to be close to the farmers, for transport-logistical and other reasons.

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PROMOTE PROMISING GOOD PRACTICE FARMING/BUSINESS MODELS!



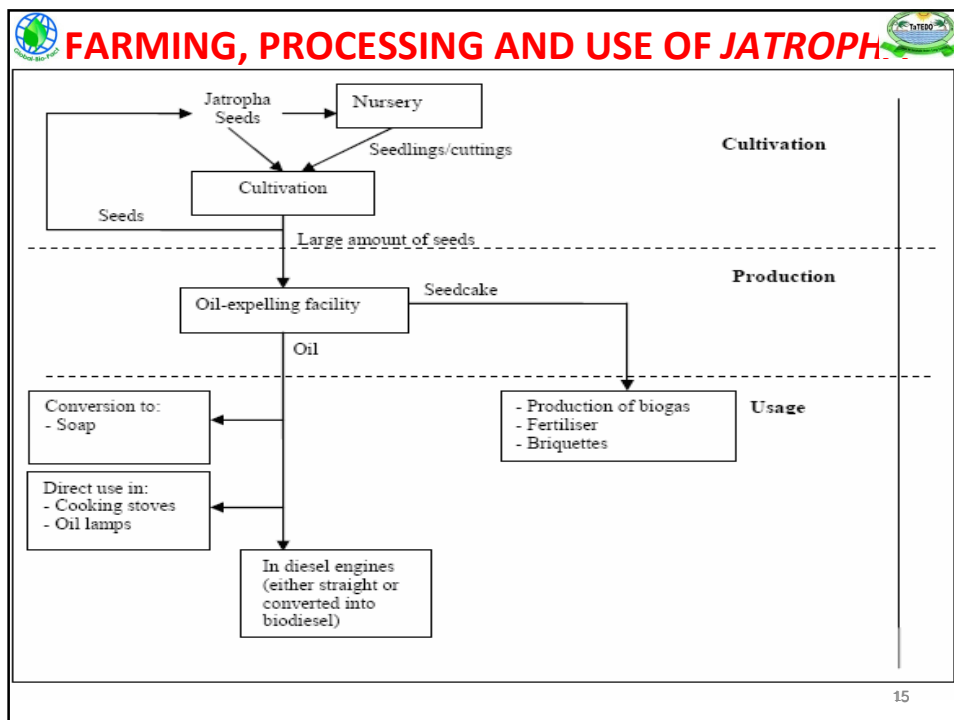
Africa has more than 600 million small holder farmers who could produce adequate food and *biofuels* for local and export needs. (at least 600 bill. Litres per year)

- ❖ These farmers need to be helped to organize themselves and access finance and other inputs to cultivate Jatropha and process it for oil (SVO) and Biodiesel, for which there is a huge demand locally and outside Africa.
- ❖ Support the set up of Local/joint venture Companies for the local production of biodiesel, to meet growing local demand, and export.



Jatropha Farm

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THREATS FROM THE *JATROPHA* INDUSTRY

The *Jatropha* production through large scale plantations in Africa is growing rapidly despite several real and potential doubts:-

- ❖ Loss of rights to customary land, marginalization of local people.
- ❖ Negative environmental impacts.
- ❖ Little public awareness and knowledge on *Jatropha*.
- ❖ Lower food security due to land and labor competition.
- ❖ Water conflicts in irrigation schemes e.g in Kenya.
- ❖ Absence of appropriate policy and regulatory framework.



RECOMMENDATIONS AND CONCLUSIONS



Jatropha oil and biodiesel production could play important role in improving livelihoods of people in Africa. Local processing and use can provide modern energy services for:

- Greater employment, income generation, technological transfer, cleaner environment, energy security, gender equality and above all economic and social well being.
- Jatropha production in Africa, represent a growing industry, challenge is to balance large scale producers with small scale local producers and users, could co-exist if proper regulations and enforcement is in place.

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RECOMMENDATIONS AND CONCLUSIONS CONT'



Jatropha production development in Africa would need to be done in a Sustainable manner, addressing issues such as:

- Agronomy research on Jatropha and its by products, it is important to increase the profitability of Jatropha projects, high-yielding Jatropha crops and through the sales of by products based on processing.
- Agricultural land and labor competition, Scarce water resources, Soil erosion, food versus fuel, trade, biodiversity concerns etc.
- Policy and regulatory framework geared towards supporting smallholders and meeting local markets first before export.
- National and local capacity for development of Jatropha industry at all levels.
- Financing facilitation in supporting small holders and cooperatives local production and use of Jatropha oil and other byproducts;
- Market development need to be integrated in business models for households, community needs and local companies producing biofuels for local, national and export requirements.
- International collaboration and support is crucial for sharing good practices, capacity development and financing to enhance; **large scale Jatropha biofuels production through smallholders in Africa;**

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13.0 About TaTEDO



- Is a sustainable modern energy development organization based in Dar es Salaam with energy activities in 9 regions and in more than 100 villages in Tanzania.
- **Vision:** Poverty free and self reliant communities in Tanzania accessing sustainable modern energy services.
- **Mission:** To Advance popular access to sustainable modern energy technologies in marginalized communities in Tanzania, through technological adaptations, community mobilization, capacity building and advocacy for increased access to sustainable energy services, poverty reduction, environmental conservation and self reliance.
- Has diverse partnership base locally and internationally with GOs, LGAs, NGOs, Private Sector, Donors, and communities.
- Has field experience of more than 18 years on sustainable energy activities - studies, planning, implementation, enterprises and policy support, monitoring and evaluation.
- Has an interdisciplinary team of about 50 staff.

3/30/2011

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**THANK YOU VERY MUCH FOR YOUR
ATTENTION**

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