

# JATROPHA CULTIVATION IN NIGERIA

*Field Experience and Cultivation*

By

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# NIGERIA IN PERSPECTIVE

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Nigeria is a biologically diversified country with an extra-ordinarily large human population of about 140 million people that includes nearly one out of every five people living in Sub-Saharan Africa. This population is growing rapidly and migrating to increasingly large urban centres that are among the largest cities in the world. Although Nigeria is among the world's countries with the largest deposits in hydrocarbon (crude oil and natural gas) and receives considerable revenue from its large multinational oil industry sector, this money rarely trickles down to the populace, who are generally poor and growing poorer. This combination of expanding population and increasing poverty is putting increasing secure demands upon the few natural areas and significant biodiversity that remain.



# Major Natural Habitats of Nigeria

**A recent study has found that 40.2% of Nigeria has been converted to intensive (crop) agriculture, 20.6% to extensive (grazing) agriculture and another 0.6% to urban development. The remaining land (less than 39%) contains important biodiversity and natural ecosystems. Table 1.1: The land area under different vegetation types and amount of land designated as forest reserves**

S/N	Vegetation type	Total land (km <sup>2</sup> )	Area of forest reserve (km <sup>2</sup> )
1.	Sahel Savanna	31,463	2,572
2.	Sudan Savanna	342,158	31,247
3.	Guinea Savanna	400,168	38,271
4.	Derived Savanna	75,707	3,208
5.	Bain forest	95,653	19,986
6.	Fresh water-swamp forest	25,653	250
7.	Mangrove swamp and coastal veg.	12,782	522
	<b>Total</b>	<b>983,584km<sup>2</sup></b>	<b>96,062</b>



# JATROPHA TO THE RESCUE

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The Jatropha species found in Nigeria are of the wild, yet there is good story about it. Between 1998 and 2009, NGOs and CBOs are actively engaged in Jatropha as an alternative source of energy, rural development and poverty alleviation. The Greenshield of Nations has been involved in sensitizing the Nigerian people, the government at all levels including traditional institutions on Jatropha project. The National Assembly Committees on Agriculture and Environment, the Presidency, the Northern Governors Forum, the First Lady of Nigeria's NGO WAYEF, committee on desertification are part of the efforts of GSN to promote and advocate for Jatropha project. First as a source of biodiesel and secondly as an afforestation project and other derivatives.



# FIELD EXPERIENCE

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- In Nigeria, farmers intercrop *Jatropha* with other plants like maize and cassava in between the *Jatropha* trees, so he does not have to look for another land to plant. The reasons behind intercropping strategy are essentially risk spreading in the event of adverse weather, although crops can also benefit from plant shadowing effects, and 'natural' disease and pest control. A combination of certain selected food crops and *Jatropha* might have positive overall impacts on yields and farmer income. Intercropping is successful in Nigeria.
- Intercropping also provides farmers with a form of insurance against crop failure. The growing period of one crop is usually different from that of the other, so if the rains are late for one crop and reduce its growth they may arrive in good time for the other crop.

## Field Experience (contd.)

- The trees are well adapted to arid conditions and have a 'built-in' capacity to combat desertification by restoring vegetative cover. In addition, the plant is relatively drought resistant, this largely depends on the method of cultivation. It is suitable for sand dune stabilization and soil conservation areas. *Jatropha* has potential for controlling soil erosion and increasing the habitat for wild animals." It does not require any particular soil type for growth and can flourish on almost any soil composition. *Jatropha* cultivation is already popular, researched and tested worldwide. Its oil yield in Nigeria is above 40%. Nigeria has ample availability of economic, deforested and large chunks of wasteland mass which can be utilized for the *Jatropha* cultivation.



# PROPAGATION AND CULTIVATION

- It is Jatropha's ability to grow on marginal, waste or arid land and produce energy crops without displacing food crops that is perhaps of most potential importance to the developing world like Nigeria, particularly as we face the affects of climate change. The benefits for the developing world go further than producing fuel for local use.
- The planting, growing and refining of Jatropha seeds require man-power; its cultivation generates large numbers of jobs in areas of low employment. Jatropha grows readily from seeds or cutting of the stem.



**Reclamation of waste land**



**Newly planted Jatropha on the waste land**



**Restored waste land with Jatropha plant**



## PROPAGATION AND CULTIVATION (contd.)

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- However, trees propagated by “cuttings” show a lower longevity and possess a lower drought and disease resistance than those propagated by seeds. Trees produced from cuttings do not produce true taproots (hence less drought tolerant), rather they produce pseudo-taproots that may penetrate only 1/2 to 2/3rds the depth of the soil as taproots produced on trees grown from seed. Clonal propagation by cuttings or other methods from trees that are known to produce high yields of seeds is the fastest way to develop high yielding varieties.
- Spacing between plants influence yields, and those with wider spacing have the highest seed yields (e.g; 3m x 3m), likely a result of reduced competition for moisture and nutrients. Plants propagated by cuttings show a lower longevity and possess a lower drought and disease resistance than plants propagated by seed.



# Advantages

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- The advantage of Jatropha is in its capability to grow on marginal land and its ability to reclaim problematic lands and restore eroded areas. As it is not a forage crop, it plays an important role in keeping out the cattle and protects other valuable food crops or cash crops. Jatropha products from the fruit – the flesh, seed coat and seed cake – are rich in nitrogen, phosphorous and potassium (NPK) and are fertilizers that improve soil.
- Self sufficiency in bio-diesel for transportation, industries, rural electrification.
- To reduce importation of Kerosene and diesel and save foreign exchange and petroleum subsidy.



# Uses in Nigeria

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- The Jatropha plant is variously useful for medical purposes.
- Jatropha is planted in the form of hedges around gardens or fields to protect crops against roaming animals like cattle or goats.
- Jatropha plants are used as a source of shade for coffee plants; tomatoes, pepper.
- The seeds or beans are used as a laxative, that is against constipation in traditional medicine.
- The latex / sap for wound healing.
- The leaves as tea against malaria etc.
- Jatropha hedges are planted to reduce erosion caused by water and/or wind.
- Jatropha is planted to demarcate the boundaries of fields and homesteads.
- Cars do not need to be modified to use the resulting bio-diesel, as in the case with Ahmadu Bello University Centre for Biodiesel.

# ENERGY USE OF JATROPHA OIL

- Jatropha oil is an important product from the plant for meeting the cooking and lighting needs of the rural population, boiler fuel for industrial purposes or as a viable substitute for diesel.
- Substitution of firewood by plant oil for household cooking in rural areas will not only alleviate the problems of deforestation but also improve the health of rural women who are subjected to the indoor smoke pollution from cooking with inefficient fuel and stoves in poorly ventilated space. Jatropha oil performs very satisfactorily when burnt using a conventional (paraffin) wick after some simple design changes in the physical configuration of the lamp.



**Cooker for Jatropha oil**



**Jatropha oil lamp**



# Efforts to Institutionalize Jatropha Project in Nigeria

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- Training
- Workshops and Seminars
- Capacity building
- Partnerships and fellowship
- Development of a model and settlement for Jatropha cultivation and plantation as in the case of Dadauwa of Nigeria / FELDA of Malaysia.



# Stakeholders

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- Governors
- National Assembly
- Ministries of Agriculture, Environment, Science and Technology, National Planning
- Traditional institutions (Arewa Consultative Forum)
- CBOs, NGOs
- Jatropha out growers at community, local government, state and federal levels
- Foreign Investors from Europe, South Africa, China and Local investors at State level



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## **Government / Institutions**

- Nigeria Investment Promotion Council /NACRD
- Commercial Banks

## **Application of Jatrpha Oil**

- MTN Nigeria - 5% generator set
- World Bank - supported programme
  - on model village for Biodiesel
- Pure Jatropha oil as a substitute to Kerosene and Diesel for household energy and rural agro-industries.
- Income generation to rural women in the production of soap, candles and cosmetics.



# Future Outlook

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- Bright and encouraging.
- Federal Government has allocated \$1.3 billion for commercial farming including Jatropha.
- The Federal Ministry of Science and Technology has taken up the fight at the highest level to make Nigeria a world player in Jatropha project.
- The afforestation programme of the current government has considered Jatropha to be used for afforestation of desert prunned Northern Nigeria.



# Challenges

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- Biofuel competing with food crops
- Absence of administrative framework
- The use arable land for growing Jatropha
- Energy mix (new developments in renewable energy could challenge the prospect of Jatropha farming).
- R & D is at its low EBB
- Low availability of high quality seeds



# The Way Forward

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- Enacting law for establishing settlement villages and in communities
- Establishing a fund to support the development of Jatropha systems
- Provision of fiscal incentives to Jatropha farmers
- Growing and encouraging public private sector partnerships
- To contribute towards biodiesel production, electricity generation, increased production and prosperity.
- To improve quality of Jatropha planting materials as per need.
- To create additional source of income for small and marginal farmers in particular and farming community in general.
- To enhance research and development to fill in the gaps in the knowledge of Jatropha, such as genetic variation and production, pressing optimizing, etc.



## The Way Forward (contd.)

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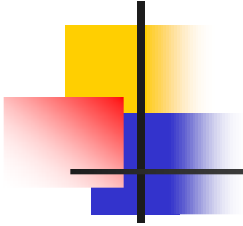
- Establishment of jatropha farm resettlement scheme
- Establishment of Bio-fuel resource center
- To focus on product marketing to stimulate production
- To up-scale opportunities in the Jatropha value chain
- To update and consolidate relevant global experiences and findings
- To innovative methods to promote venture, linkages technology transfer and uptake



# CONCLUSION

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- Jatropha cultivation is at its infant stage in Nigeria. However, there is a very strong desire among the people to cultivate Jatropha. The Government is prepared to support the Jatropha project despite being an oil producing nation. The future is Bright for this project. However, there is need for capacity building, R&D effort, policy direction and international partnership to drive the process to success in Nigeria.



**THANK YOU**

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