



# Development of decentralized *Jatropha* oil production and marketing chains in Senegal: a promising way to combine CO<sub>2</sub> emission reduction and rural poverty alleviation

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## Introduction

*Jatropha curcas* L. (JCL) is a multi purpose hardy shrub that belongs to the *Euphorbiaceae* family. Originating from Central America it is now widely distributed in almost all tropical and subtropical regions of the world. Recent investigations have demonstrated that JCL could contribute to alleviate the consequences of global warming and improve the living conditions of rural populations in the least developed countries. Primary characteristics favouring *Jatropha* over other agro-fuel feedstock crops are its non food nature, its multiple uses (oil production, plot delimitation, traditional medicine, pest control, etc.), reported ability to grow on marginal land and the need for limited rainfall. There are also claims of *Jatropha* interest in preventing deforestation and desertification, and improving soil fertility.

However, for several reasons, both technical and socio-economic, the full potential of JCL is far from being realized. The variation of the plant behaviour according to the agro-ecological conditions is insufficiently documented and management recommendations adapted to the existing farming systems have not been yet developed. Besides the quantification of the real yield potential of the crop in the existing agro-ecological conditions, and the determination of the most sustainable and profitable production practices suited to pure stand cultivation and intercropping systems involving JCL, it is of utmost importance to develop sustainable organisational models of local production chains that can be mastered by small-scale growers in order to allow them to benefit fully of the potential of the crop. In these decentralized JCL chains the oil extracted from the seed is the main output. It can be used (i) directly in unsophisticated diesel engines that can power various tools (cereal mill, husker, alternator, etc.), (ii) in adapted stove, (iii) to produce soap or, (iv) as biopesticide.

## Material and Methods

Four pilot actions have been launched in different regions of Senegal during the last two years to overcome the constraints that limit the full exploitation of JCL potentialities. These projects are carried out by Durabilis Foundation with the scientific support of Gembloux Agricultural University, Aide au Développement Gembloux NGO, Eau Electricité Solidarité Foundiougne program, and Société Boulonnerie Europe - Senegal Company and located in the departments of Dagana, Tambacounda, Foundiougne and Tivaouane respectively. These areas are representative of most of the different agro-ecological regions of Senegal. Each pilot project tests different production practices (under rainfed or irrigated production conditions) and organisational models (cooperatives, local company involving growers, informal producer groups) adapted to the local environments for the production, the transformation and the marketing of *Jatropha* oil.

## Results and discussion

The preliminary results obtained so far highlight the following points:

- A good tending of the crop during the first months after direct sowing or planting is important because JCL is sensitive to the concurrence of weeds or of companion crop with large vegetative development (sorghum, millet, maize).
- JCL is not immune to pest infestation and adequate protection methods need to be implemented to avoid the total destruction of the crop in its early development stages after direct sowing.
- Protection against divagating animals after planting (especially during the dry season) is absolutely necessary.

These action-research initiatives should allow identifying the adequate solutions for the implementation of decentralised production and marketing chains of JCL in Senegal and quantify their exact potential for CO<sub>2</sub> emission reduction and rural poverty alleviation.

## Pests found on JCL



*Stomphastis thraustica*  
 (Lepidoptera, Gracillariidae)



*Pempelia morosalis*  
 (Lepidoptera, Pyralidae)



*Calidea panaethiopia*  
 (Heteroptera, Scutelleridae)



Leaf miner larva



Stem miner larva



Fruit borer



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