

DAIMLER

Oil from a Wasteland - The Jatropha Project in India – Part 3

Deforestation and soil erosion deteriorated wide areas into wasteland. As the soil eroded poverty came. With the jatropha project DaimlerChrysler, the University of Hohenheim and an Indian institute for research want to break the vicious circle.

[For the inhabitants of the village of Chorvadla in the state of Gujarat, the jatropha project is a ray of hope.](#)

Breaking the cycle of poverty

“Desolate” is the only word for the 43,000 square kilometers of eroded terrain and salt desert in Gujarat. Especially during the long periods of drought, this territory, which is larger than Switzerland, looks nearly as barren as the surface of the moon. Wherever you look, there’s nothing but bare rocks and dry grass, punctuated here and there by a few scrawny bushes. Not even the frugal people of Gujarat can find a use for this land.

Up until a few generations ago, large parts of Gujarat were still thinly covered with forests. But the inhabitants used the wood as fuel for cooking, and the monsoon rains, which are always violent if not plentiful, completed the erosion process. The rainwater washed away the topsoil from the deforested areas, and the dead roots of the trees could no longer retain the water that drained into the soil. As a result, the soil continually lost moisture and nutrients.

And as the soil eroded, the already harsh living conditions of the local people deteriorated even further - a process that is typical of many regions of India. Here, 16 percent of the world’s population is struggling to survive on only 2.4 percent of the planet’s land mass. The pressure of this intense land utilization is causing more and more forests and agricultural land to deteriorate into useless wasteland. In 2000, India’s Ministry of Land Use classified nearly 65 million hectares of the subcontinent - about one fifth of its entire territory - as wasteland. According to the Indian government, 174 million hectares - more than one half of the country’s territory - are suffering to a greater or lesser extent from land degradation.



The cultivation of frugal jatropha plants stops soil erosion and can turn wasteland back into agriculturally useful land

But this process of deterioration is not the result of a law of nature. That’s why Daimler joined together with experts from India and Germany in January 2003 to launch a pilot project for the cultivation and use of the jatropha plant. The aim is to demonstrate that the vicious circle of erosion, soil deterioration and poverty can be broken. The five-year project has brought together partners that are not usually involved in agricultural development projects:

The Central Salt & Marine Chemicals Research Institute (CSMCRI) in Bhavnagar is responsible for selecting lines of jatropha that are suitable for cultivation, propagating the seedlings and setting up and operating the plantations at two different sites. In the past, the institute has investigated the use of salt-tolerant plant species to transform wasteland into agriculturally useful land. In the process, it came across the robust jatropha plant, which flourishes despite its extremely modest requirements

[Scientists at the CSMCRI in India select, cultivate and propagate the jatropha plants.](#)

This research was supported by a team from the Multifunctional Plants - Food, Feeds and Industrial Products working group, headed by Prof. Klaus Becker, from the department of Aquaculture Systems

and Animal Feed at the University of Hohenheim, Germany. Prof. Becker's department has gathered experience from similar projects on several continents that are investigating the utilization of multipurpose plants.

The researchers from Hohenheim are now working to optimize the cultivation of the jatropha plant and evaluate the results gained from the project.

Several business units from Daimler are also involved. On the basis of initial test results gathered in the course of a tour through India in April and May 2004, Daimler India aims to subject the biodiesel fuel derived from jatropha oil to thorough testing in a fleet trial. At Daimler in Stuttgart, Germany, a research team headed by Prof. Rudolf Maly tests the quality of the fuel derived from jatropha oil to establish its suitability for use in modern diesel engines.

The Group has adapted several Mercedes-Benz C 220 CDI for use with this biodiesel and is coordinating the project as well as being responsible for two-thirds of the total costs of around 600,000 euros. The remaining third of the costs will be paid by the German Development Society, while the Indian government is covering the CSMCRI's personnel costs for its project work in the country.

Rudolf Maly is very clear about the reasons why Daimler became involved in the project: "Sustainable



mobility is one of the central aims of the Group. The use of renewable raw materials both as components in our vehicles and as fuels - wherever it makes technological and economic sense - is another goal of our work. And the jatropha project gives us the opportunity to try out a very promising model concept that could turn these goals into practical applications." According to Maly, the Group aims to demonstrate to customers and public authorities in India that modern diesel engines produce only slightly more

pollutants than gasoline engines, while offering significantly greater fuel economy. What's more, the necessary fuel can be produced in India from renewable sources.

And that's an especially important issue for the Indian economy: The growing mobility of the Indian population has steeply increased the demand for crude oil, and local production is no longer able to meet local needs. Today, India buys 70 percent of the oil it needs on the global market, and crude oil imports make up about 30 percent of its entire import budget. Over the long run, biodiesel produced from renewable sources could help to reduce these import figures. And the cultivation of energy-producing plants such as the jatropha bush would not compete with food producers for arable land.

On the contrary, the scientists involved in the jatropha project are also investigating whether cultivating these energy-producing plants over many years could eventually regenerate wasteland and make it fit for agricultural use. They're hoping that the cultivation of jatropha will halt erosion and even improve the quality of the soil in the long term. That's because the cover of vegetation created by the jatropha plantations protects the soil from further removal of humus by wind and water. The spreading roots of the plants enable the soil to hold more rainwater over longer periods of time, and the dead leaves and other plant material increase the amount of nutrients in the layer of new topsoil being formed. Plans call for the mixed cultivation of jatropha and shade-loving garden plants such as tomatoes on selected parcels of land in order to investigate this process.

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