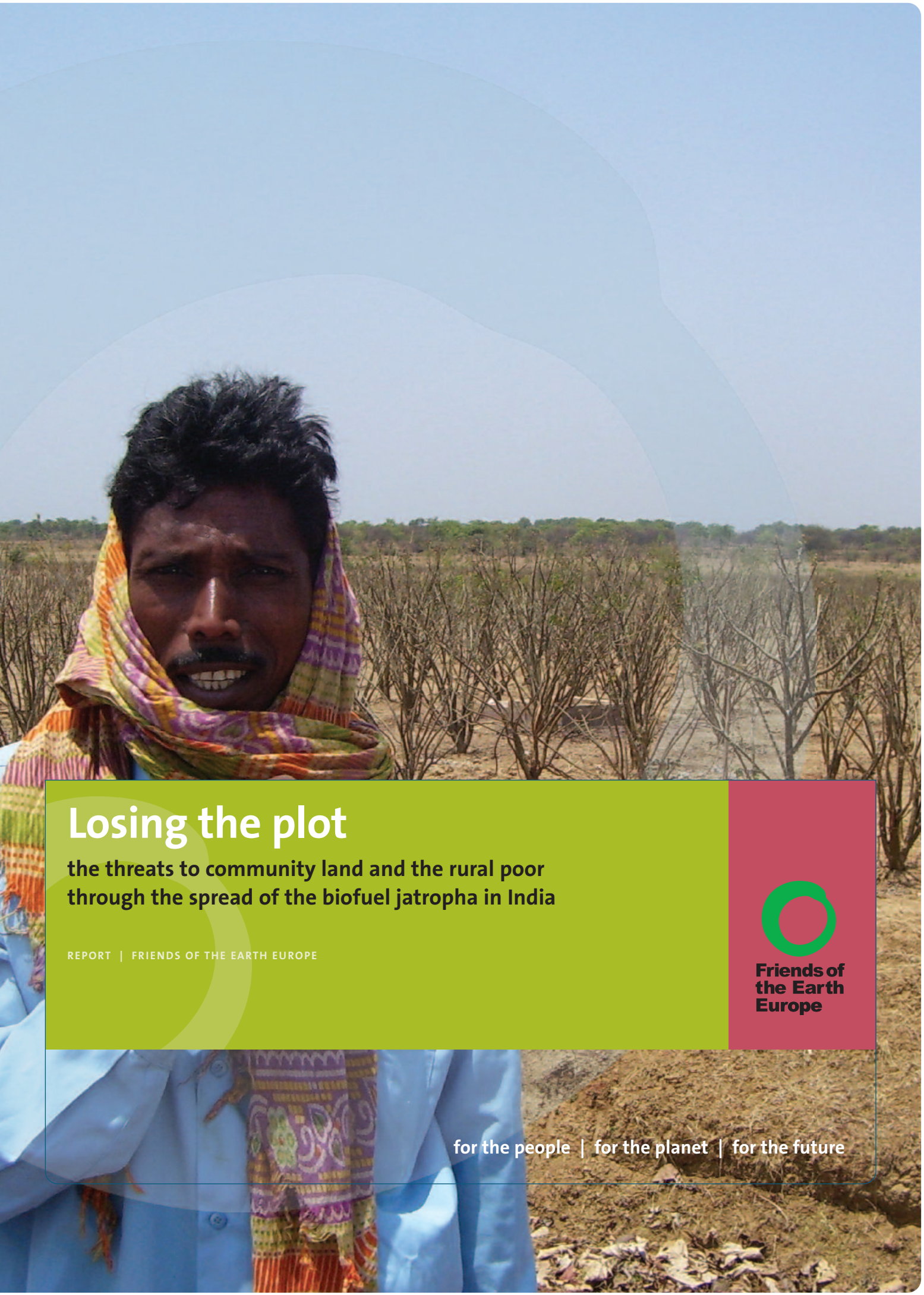


# Losing the plot

## the threats to community land and the rural poor through the spread of the biofuel jatropha in India

REPORT | FRIENDS OF THE EARTH EUROPE

Friends of the Earth Europe

for the people | for the planet | for the future

Friends of the Earth Europe

**Friends of the Earth Europe** campaigns for sustainable and just societies and for the protection of the environment, unites more than 30 national organisations with thousands of local groups and is part of the world's largest grassroots environmental network, Friends of the Earth International.

This report has been produced with the financial assistance of the European Commission's DG Environment and Action Aid. The contents of this publication are the sole responsibility of Friends of the Earth Europe and can under no circumstances be regarded as reflecting the position of the European Union.

**Research:** Souparna Lahiri

**Publishers:** Friends of the Earth Europe

**Editorial team:** Helen Burley, Adrian Bebb

With additional support from Action Aid

**Publishing date:** December 2009

**Design:**
**one**hemisphere, Sweden
our@onehemisphere.se
www.onehemisphere.se

**Cover image:** Bittal Tarak, villager, Sunderkera, Raipur district.
© Alok Shukla

**Images:** All photos by Souparna Lahiri unless otherwise stated

**Available for download at:** *www.foeeurope.org.*

for the people | for the planet | for the future

***Friends of the Earth Europe***
Mundo-b building, Rue d-Edimbourg 26,
1050 Brussels, Belgium
tel: +32 2 893 1000 fax: +32 2 893 1035
e: info@foeeurope.org **www.foeeurope.org**

# Losing the plot

# Executive Summary

**India, the world's second most populous country and largest democracy has developed rapidly, ranking as the world's 12th largest economy. But a third of India's population lives below the poverty line, including large numbers of rural poor who depend on subsistence farming and forest farming to feed their families.**

As India's economy has grown, its energy demand has increased rapidly and the Indian government has looked to alternative supplies, including biofuels. The jatropha plant – a bush native to South America which grows in dry areas and can produce oil-rich seeds – has been identified as an ideal source of biodiesel, with a target set to replace 20% of diesel consumption by 2017.

Biofuels crops have been the subject of widespread criticism as growing demand to use crops for fuel has impacted on food prices, biodiversity and rural communities. As a non-food crop, jatropha was recommended as not affecting food supplies. It would create jobs in rural areas, driving development, the government claimed.

This report looks at the impact of India's jatropha targets on rural communities, focusing on the state of Chhattisgarh - a traditional rice-growing area where the crop is being grown. The report finds that thousands of tribal and lower caste Indians have been forced from community lands which they have relied on for generations. Without consultation or consent, common lands traditionally used for livestock grazing and subsistence farming by some of India's poorest communities has been forcibly grabbed and planted with jatropha. Objectors have often faced brutal repercussions and legal battles.

Yet the enthusiastic, and at times aggressive, fervour for the crop has brought little in return, as a poor awareness and understanding of the optimum growing conditions have meant that many crops have failed to thrive.

The report also questions the Indian government's designation of land as suitable for jatropha. Some 13.4 million hectares of land were earmarked for jatropha across the country, including 3 million hectares of forest land and 4 million hectares of "waste land". But the report finds that much of this so-called "waste land" is not suitable for any form of cultivation, even though it often provides key shared community resources, such as village forests and commons, providing food, fuel and timber for many of the poorest rural communities. The forest lands are often inhabited by forest dwellers who depend on forest access to survive.

Evidence suggests that jatropha grown in its present form is unlikely to deliver the benefits its supporters have promised. Grown alongside other crops, with refining facilities in place, jatropha may deliver local benefits, but to remain sustainable, such developments would be small-scale in nature and in the control of local people. In reality, the most vulnerable communities are losing access to their land to the rapid spread of jatropha. Instead of being the saviour, it is becoming a threat to the rural people it was supposed to benefit.


*Jatropha fruit usually contains three seeds. The oil is then converted to biofuel.*

# Introduction - modern India

1

The rapid development of India, the world's largest democracy and the second most populous country, has brought new opportunities but also new challenges. Although it has the world's 12th largest economy[1], a third of its population lives below the poverty line and it trails in at 128th in the UN Development Programme's Human Development Index[2].

India's economy has grown on the back of agriculture, textiles, software services and technology. Despite its image of booming cities, some 60 per cent of India's population work in agriculture[3].

This rural economy is where many of India's poor are found. Seventy per cent of India's 1.1 billion people live in the rural villages. Rural poverty is particularly high among those who do not own their own land or who only have access to marginal land, including those who work as agricultural labourers[4]. Many of these rely on subsistence farming and forest farming to feed their families.

Some 23,41% of India's land area is recorded as under forest. A World Bank study found that 275 million rural poor, including many indigenous people, depend on the forests for part of their livelihoods. Forests can provide timber, fruit, and medicinal plants, but the study found that half of India's forest areas are degraded as a result of grazing and agriculture (this is contested by forest groups), reducing the opportunities for income generation[5].

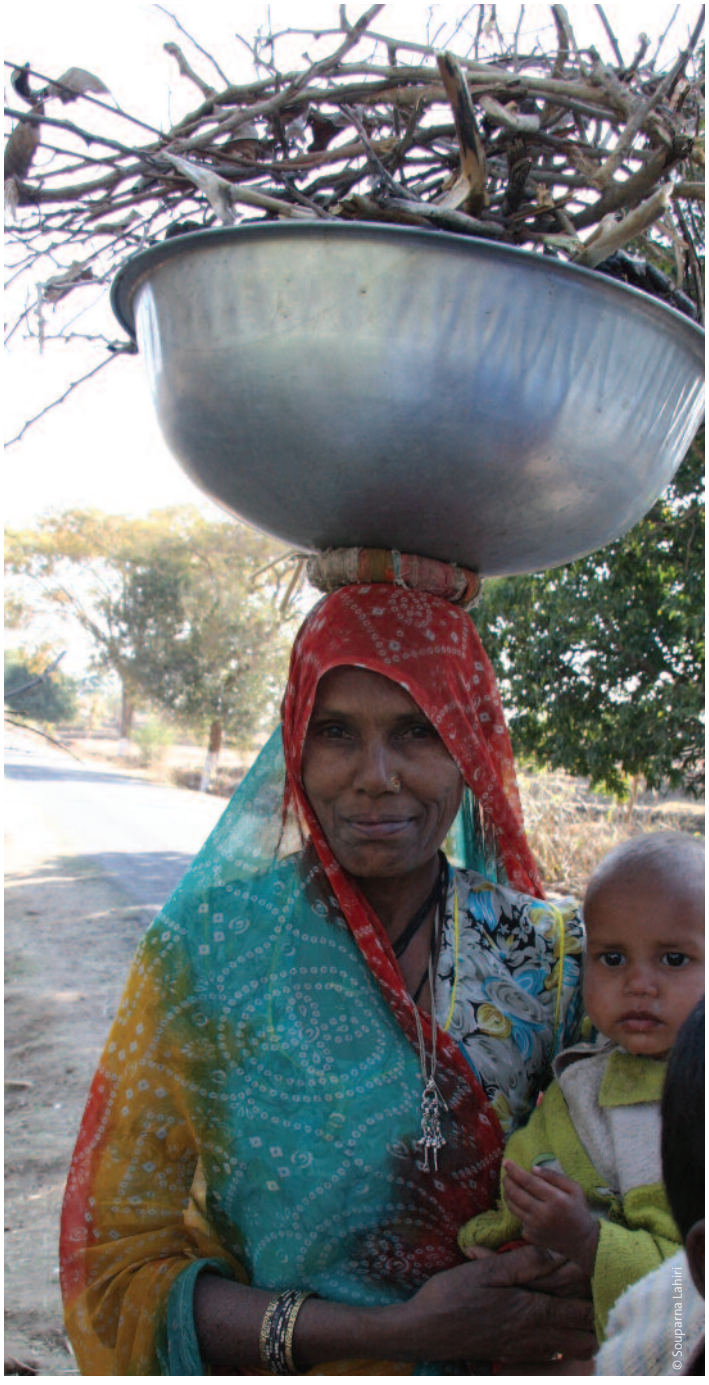
Such levels of poverty impact on life quality, on health and the basic need to get access to food. According to the UN Food and Agriculture Organisation, one in five people in India do not get enough food[6] and more than 50 per cent of children under the age of five are classed as underweight[7].

Natural disasters also take their toll. The Indian subcontinent is highly vulnerable to droughts, floods, cyclones and earthquakes, and is considered one of the most disaster-prone countries in the world. Each year an average of 56.6 million people are affected by natural disasters in India[8].

Droughts impact heavily on agriculture, with 68% of the country's sown area affected by drought[9].

The United Nations Environment Programme, together with the Indian Government have identified five key areas of concern for India's environment. One of these is land degradation resulting from poor land management[10].

Under the Indian Constitution, it is the duty of the state to "protect and improve the environment and to safeguard the forests and wildlife of the country"[11].




*Jatropha used as a tradional hedge fencing, Medha village.*

1 http://news.bbc.co.uk/1/hi/world/south_asia/country_profiles/1154019.stm
2 http://hdr.undp.org/en/media/HDR_20072008_EN_Indicator_tables.pdf
3 http://www.state.gov/r/pa/ei/bgn/3454.htm
4 http://www.un.org/esa/earthsummit/india-cp.htm#chap14
5 http://www.worldbank.org.in/wbsite/external/countries/southasiaext/indiaextn/0,,contentmdk:20871856~pagepk:141137~pipk:141127~thesitepk:295584,00.html
6 http://www.alertnet.org/thefacts/countryprofiles/216217.htm
7 http://www.searo.who.int/en/Section313/Section1519_10855.htm
8 http://www.rrcap.unep.org/reports/soe/india_part2.pdf (p36)
9 http://www.rrcap.unep.org/reports/soe/india_part1.pdf
10 http://www.rrcap.unep.org/reports/soe/india_part1.pdf
11 Article 51 A

# India's energy needs and the role of biofuel

# 2



*Jatropha planted on community grazing land, Medha village.*

India's rapid economic growth has resulted in growing demand for energy and the country now ranks sixth in the world for commercial energy consumption. Crude oil imports increased by more than 70% to 147 MT in 2007, with a cost to the Indian economy of $18 billion a year (and rising)[12].

Electricity generation in India relies heavily on coal, hydro, oil and nuclear energy, with an increase in renewable power from wind and solar in recent years[13].

Demand for transport fuel, particularly diesel, is also rising steadily and India is heavily dependent on imports - just 22% comes from domestic oil supplies.

India has been keen to reduce its increasing oil import bill and the government has been an enthusiastic supporter of biofuels, particularly ethanol and plant oil derived biodiesel.

The government has embraced biofuel production as an environmentally benign, climate-friendly source of fuel, but also sees them as providing a broad range of positive economic and social benefits, particularly for rural communities.

## 2.1. India's National Biofuel Programme

The Indian Government's Planning Commission proposed a National Mission for Biofuel in 2003, which triggered widespread interest in the development of biofuel crops at a state level.

Biofuel in India is primarily made from sugarcane molasses or from oil-bearing plants like jatropha. While molasses yield ethanol used as a blend with petrol, jatropha and other oil-bearing plants can be turned into biodiesel.

The Mission proposed a two-phase project, led by the Ministry of Rural Development, with a target of producing enough biodiesel to provide 20% of diesel fuel by 2011-12.

The Ministry of New and Renewable Energy however put forward a separate proposal for a national biofuel policy and biofuel development board. This proposed the widespread cultivation of jatropha to produce enough biodiesel to replace up to 20 per cent of petrol and diesel consumption by 2017.

After considerable debate, in August 2008, the National Biofuel Mission was shelved[14] amidst widespread concern about rising food prices and the use of farmland to grow fuel. But in September 2008 the Indian Government approved the national biofuel policy[15], giving jatropha the green light.

Jatropha was put forward as the most suitable crop because, it was said, that it could be grown on a range of available land, including in under-stocked forests, on public land alongside railways and roads, and alongside agricultural crops. An added advantage was that it would help improve degraded land and so play a part in poverty alleviation programmes.

To meet the National Biofuel Policy target of replacing 20 per cent of petrol and diesel consumption by 2017, 30 to 40 million hectares would be needed.

12 Ministry of Petroleum & Natural Gas, Government of India
13 http://www.rrcap.unep.org/reports/soe/india_part2.pdf p9n.pdf
14 Sushmi Dey & Rajeev Jayaswal, Biodiesel mission set to pull down shutters, The Economic Times, August 4, 2008, New Delhi
15 PM refers bio-fuel policy to Pawar panel for a relook, The Times of India, 3 November 2008

# Jatropha

# 3



*Jatopha curcas*

## 3.1. What is jatropha?

Jatropha *curcas* bears oil-rich seeds and is native to South America. It has been introduced widely in Asia and Africa where it is traditionally used for hedges, because it is not grazed by animals. Oil from the seeds is also used to make soap. In India it is also known as ratanjyot and bhagarenda.

Jatropha *curcas*, the variety being promoted for biofuel, is a bushy tree that can grow in dry and semi-arid areas. Its seeds are known in some places as "physic nuts" because of their medicinal properties. But the plant itself is poisonous, and the oil it produces is not edible[16].

In Western Australia, it is classified as a noxious weed because of its toxic and invasive nature. The state government warns that the oil produced from jatropha contains carcinogenic substances and presents a significant human and animal health risk[17].

## 3.2. Jatropha promotion

The Indian Government's proposal to launch a National Biofuel Mission in 2003 triggered widespread interest in biofuels and in particular jatropha, particularly at the state level.

According to the Planning Commission, jatropha was an ideal crop because it could help reduce soil erosion and land degradation, enriching the soil as well as contributing to global efforts to reduce carbon emissions and tackle climate change[18].

The Planning Commission identified 13.4 million hectares of land, which could be planted with Jatropha *curcas*. This included:

- 3 million hectares (notional) of forest land (out of India's 31 million hectares of under-stocked forest).
- 3 million hectares (notional) of jatropha plants for hedges on agricultural land (on the basis that 30 million hectares of farmland is likely to be hedged).
- 2 million hectares (notional) agro-forestry, seen as particularly suitable for absentee landlords.
- 10% of fallow lands, creating 2.4 million ha.
- 2 million ha on wastelands under Integrated Watershed Development and other poverty alleviation programmes.
- 1 million ha (notional) on public lands along railway tracks, roads and canals.

A further 4 million ha of "waste land" could also be assumed to be available, according to the Commission.

Jatropha's status as a non-food crop was a crucial factor for the Government. As food prices surged, with shortages in many parts of the world, land use for fuel production has come under increasing criticism.

But while jatropha can be grown on land that is not suitable for food production, it can, and in fact, is often grown on cultivable land as it produces much higher yields here.

The Commission claimed that jatropha would generate "massive income and employment for the poor," providing employment for 127.6 million man-days in the plantations and 36.8 million person days for seed collection by 2007. Income from the sales of seed would generate Rs 750 million, enabling 1.9 million poor families to escape from poverty.


*Jatropha used as a tradional hedge fencing, Medha village.*


*Children of Pirapal school, Kanker, with their teacher. They fell sick after consuming jatropha fruit.*

16 Claims and facts on jatropha curcas L, REE Jongshaap et al, Plant Research International, Wageningen UR, October 2007
17 http://www.agric.wa.gov.au/content/PW/WEED/DECP/fn2007_jatropha_biodiesel.pdf
18 http://planningcommission.nic.in/reports/genrep/cmtt_bio.pdf

# Jatropha

"The entire project will be community and farmer driven from plantation up to primary processing stage involving seed collection, procurement and oil extraction at the village level thus resulting in empowerment of the poor and their community in resource poor areas of endemic poverty," the Commission's report says.

This pro-poor focus, plus the environmental benefits, the report suggests, will allow the project to attract potential from bi-lateral and multi-lateral donors.

But as a result of disagreements between the Agriculture Ministry and Rural Development Ministry, the demonstration plan was not fully- implemented, leaving a number of projects stranded in mid-development, with some estimates suggesting that 300,000 hectares of "wasteland" had been planted with biofuel crops.

In the meantime, the National Oilseeds and Vegetable Oils Development Board (NOVOD), continued to promote the use of oilseeds for bio-ethanol and biodiesel, and provides advice and recommendations on setting up plantations and nurseries.

## 3.3. Regional initiatives

Jatropha has also been promoted at the state level, with individual states having the power to allocate land for jatropha cultivation, provide tax incentives, subsidies or invest in research.

In Chhattisgarh, one of the areas highlighted in the Planning Commission's proposals, the state government decided to set up its own Chhattisgarh Biofuel Development Authority (CBDA) in 2005, announcing plans to plant 160 million saplings in 2006-07, with one million hectares of jatropha on fallow land by 2012.

In a bid to encourage small farmers to grow jatropha, the CBDA offered free jatropha saplings, guaranteeing a minimum price for seed purchases, above national rates. Saplings were planted on 84,000 hectares of farmers' and government fallow land in 2005-6[19], and a biodiesel processing plant built.

In 2009, the Chhattisgarh Forest Minister reported that 100 million jatropha saplings had been planted in the last three years[20]. But he went on to acknowledge that 101 million saplings had been planted on forest land which was not irrigated and which had not yet produced a harvest[21].

In Madhya Pradesh, the state government acted as a facilitator, allocating some 20% of the state's "waste land" for jatropha cultivation. "Self-help" groups were made responsible for planting, receiving 80% of the income from the seeds in return and a biodiesel power plant has been built in village in a predominantly tribal district[22].

In Orissa, the state government has encouraged jatropha and karanja (another oil bearing tree) plantations on 200,000 hectares of "degraded" land, offering incentives to panchayats (village assemblies), cooperatives and self-help groups for large scale cultivation, as well as working with the Majhighariani Institute of Technology and Science Group[23], developing research.

Other states, which had not been targeted in the Planning Commission's proposal also have encouraged jatropha plantations.


*Jatropha plantation, Barbesan village, Chhattisgarh.*


*Jatropha plantation on previous grazing land, Chhattisgarh.*

19 www.cbdacg.com, website of the Chhattisgarh Biofuel Development Authority
20 Chhattisgarh plants 100 million jatropha saplings in 3 yrs, Business Standard, February 13, 2009, Kolkata
21 Deshabandhu, February 13, 2009, Raipur
22 Frontline, A few steps forward, Volume 23 - Issue 10 :: May. 20 - Jun. 02, 2006
23 http://www.orissalinks.com/orissagrowth/?cat=607

2

## 3.4. The corporate sector

As well as state-led initiatives to promote jatropha, a number of international companies have been eager to get involved. Some have formed joint ventures at a state level or in partnership with Indian companies and research bodies. A number of Indian companies are also active in the jatropha trade.

The Indian Oil Corporation has formed a joint venture with state government agencies in Chhattisgarh, announcing plans to employ 33,000 farmers with a view to producing 100,000 tonnes of biodiesel in Chhattisgarh[24].

The Hindustan Petroleum Corporation has formed a joint venture with the Maharashtra State Farming Corporation to produce biodiesel from 30,000ha of jatropha[25].

The Delhi-based agro processor, Tinna Oils & Chemicals Ltd has formed a partnership with US multinational ADM and aims to grow 20,000 acres of jatropha in the next four years[26]. The joint project has built a biodiesel production plant in Maharashtra and established a model plantation at Swami Ramanand Teerth Marathwada University, but says that planting has been hampered by a lack of policies for handing over "waste land"[27].

Indian company IKF Technologies has a memorandum of understanding with a Madhya Pradesh state company to develop a biodiesel refinery with 5,000 ha of jatropha plantations. It also has a number of joint venture agreements, and claims contract farming arrangements covering 10,000 ha[28].


*Jatropha plantation on 6.5 ha of village common land at Chiunri, Dhamtari district, handed over to D1 BP Fuel Crops, planted with the development fund earmarked for National Rural Employment Guarantee Scheme.*

Southern Online Biotechnologies is also behind the first Indian biodiesel project to seek approval status under the Clean Development Mechanism[29]. The company plans to build a plant with the capacity to process 30t/day of jatropha or pongamia oil in Andhra Pradesh, employing 100 people. If approval is granted, it would allow it to sell carbon credits on the global carbon market[30].

UK company D1 Oils, which had formed a now defunct partnership with BP, had said it intended to grow 1 million of hectares of jatropha within four years worldwide, with significant operations in India. In March 2009, the company claimed an interest in 220,000 hectares of jatropha plantations worldwide[31]. D1 operates in India through its Delhi-based subsidiary, Carbon Sink Fuel Crops.

D1 operates via contract farming agreements with Indian farmers and cooperatives, buying back the harvest or crude oil from the farmers for biofuel production[32]. The aim was to produce up to 1,000 tonnes of crude jatropha oil in India by 2008[33].

In 2007 the company had contract arrangements for jatropha farming on 71,237 hectares, providing seedlings and assistance with bank finance. Most of these are in the north east of the country and in Tamil Nadu. The company also has seed purchase agreements in place for a further 23,933 hectares[34].

D1 also has a joint venture with Mohan Breweries and Distilleries Limited, set up in 2004 to produce seedlings and build a demonstration refinery plant in the southern state of Tamil Nadu[35].

A further joint venture with the tea plantation group Williamson Magor & Co in 2006 extended D1 Oils India's operations into the north east of the country and the company also made a number of seed purchase agreements with other growers[36].

The company found itself at the centre of controversy in 2005 when it was accused of "biopiracy," after 18 different genetic varieties of jatropha which had been allegedly stolen from the Indira Gandhi Agricultural University were found on a D1 Oils farm. At the same time, a member of staff from the university left suddenly to work for D1 Oils.

D1 Oils said that the plants still belonged to the university, but a state government judicial report (2006) found the company to be in breach of the Biodiversity Act and it was subsequently barred from conducting research on jatropha[37].

24 Indo-Asian News Service, October 27, 2006
25 Rahul Wadke, Maharashtra to offer 30,000 ha to pvt sector for jatropha cultivation, Businessline, November 15, 2006
26 http://www.tinnagroup.com/bdd.html
27 Ashok B Sharma, Bio-diesel industry seeks govt grants to fuel growth, FE, August 22, 2007
28 ttp://www.ikfgreenfuel.com/Who_we_are.php
29 http://www.sebi.gov.in/dp/southernonline.pdf
30 http://www.unctad.org/en/docs/ditcted20066_en.pdf
31 http://www.d1plc.com/agronomyPlanting.php
32 Searing crude fuels BP's jatropha drive, TNN, December 1, 2007
33 Anil Sasi, D1 Oils target 3.5 lakh hectares jatropha plantations, Businessline, November 12, 2007http://www.thehindubusinessline.com/2007/11/12/stories/2007111250690500.htm
34 Growing Energy, D1 Oils plc Annual report and accounts 2007
35 http://www.financialexpress.com/news/Mohan-Breweries-Sets-Up-Biofuel-JV-With-D1-Oils/110985/machinery and equipment
36 http://www.d1plc.com
37 Report of the Judiciary Committee on the alleged criminal conspiracy of the stealing of germplasms and handing them to Multinational Company, September 2006.

# Jatropha

Taj Gas Limited has also set up contract farming arrangements to grow jatropha in Orissa. The company has been criticised by a number of farmers who attempted to end their contracts, after suffering financial losses trying to establish the new crop. They were told by the company that they would each have to pay Rs30,000 to release their land (468 euro).

Other companies operating in India include Reliance Industries, which has signed an agreement with the government in Andhra Pradesh to grow jatropha and build a biodiesel plant in the state. The company also plans to plant in Maharashtra, Gujarat and Rajasthan.

The Indian company Emami, involved in production of cosmetics and toiletries, is planting jatropha in West Bengal.

Entrepreneurial support for jatropha has helped drive expansion, but as yet, few companies have seen the benefits of their investment and some, such as D1 Oils have started to scale back their expectations from the crop.

## 3.5. Promoting the industry

The companies promoting biodiesel production in India have formed the Biodiesel Association of India (BAI) to represent their interests, including calls for an increase in the selling price to make it more competitive with diesel fuel[38].

The Federation of Indian Chamber of Commerce & Industries (FICCI), one of the biggest industry interest groups in India has also spoken out on behalf of the jatropha industry, putting forward a series of demands designed to boost the industry.

These included calls for a 10-year exemption of excise and customs duties on biodiesel and jatropha oil; simpler procedures for credit and loans for farmers; and capital subsidies for processing industries.

FICCI has also called for the classification of jatropha plantations as reforestation projects to make it easier to receive accreditation under the Clean Development Mechanism (one of the mechanisms established by the Kyoto Protocol to facilitate carbon offsetting by developed countries in the developing world). They want to see a special body set up to deal with carbon trading for jatropha to help farmers. The body estimates that farmers could increase their income by an average of Rs.2800/ha (€49 /ha) from carbon trading.

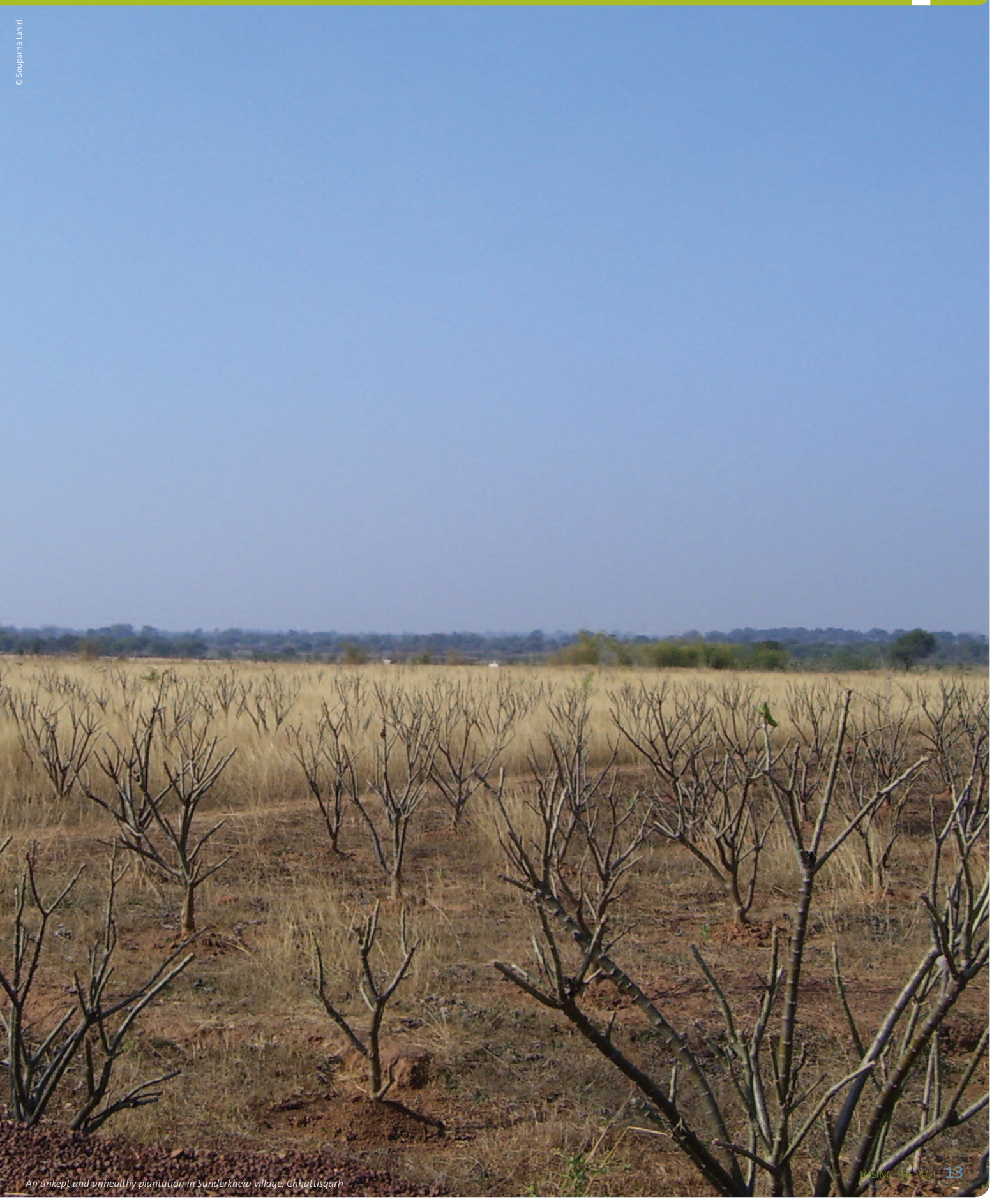
The Petroleum Conservation and Research Association (PCRA) has introduced a biodiesel bank that recognizes the efforts of various bodies in promoting biodiesel. The bank awards credit points for work done on propagation, promotion, research and development, training, and work to develop biodiesel plants and machinery.

38 Ashok B Sharma, Bio-diesel industry seeks govt. grants to fuel growth FE, February 02, 2008.

# The social, economic and environmental impacts of jatropha

# 4





*An unkept and unhealthy plantation in Sunderkheta village, Chhattisgarh*

# The social, economic and environmental impacts of jatropha

State plans to develop jatropha in forests and on waste lands are being promoted as a way of improving the livelihoods of rural communities, including some of India's poorest communities who are struggling to feed their families.

But how are rural communities adapting to this new form of farming? Is jatropha delivering the economic benefits that have been promised? Is it a good source of employment? Is it competing with food for land? Are India's rural poor benefiting from growing jatropha?

## 4.1. The economic promise

There have been various estimates of the costs and returns of jatropha plantations, with government agencies and private companies alike suggesting that the plantations can be highly profitable, with high yields and low input costs.

But studies of jatropha growth have found that to obtain an optimum yield, jatropha needs good fertile soil and also inputs such as manure, which adds to the costs. The plants need treating for pest control, and some manual labour to weed the plantation and water the site is needed. All of which increase the costs for the farmer.

> ***"We farmers are not fools, we know that to get a definite yield, and a good production jatropha plants will need care and maintenance. They will need good manure, pesticides and periodic watering."***
>
> **Darbar Singh, a farmer with 3 acres of land, Ranibachati village, Bilaspur**

Demand for jatropha seedlings has also increased the costs of setting up a plantation, and a number of private companies have set up nurseries to sell seeds and saplings in the hope of cashing in on demand.


*Pest infected jatropha in Sunderkhera village.*

Dr V Ranga Rao, former director of oil seed research at ICAR in Hyderabad warns that there is a big gap between the jatropha hype and the reality in the fields. He has seen three-year old plants that are not even capable of producing yields of 1kg/plant. Plants grown on fertile land, rather than bearing bumper yields, he says, in fact produce more leaves and become increasingly vulnerable to pests and disease[39].

He warns that the "indiscriminate and hasty expansion of Jatropha into all conceivable agro ecological and crop growing situations may cause irreparable damage to an otherwise "Golden Goose" and harm the immense opportunities it otherwise offers in the long run."

An analysis of the strengths and weaknesses of jatropha by the Centre for Bharatiya Marketing Development in New Delhi found that jatropha yields and oil content varied considerably depending on the seed quality, soil, climate and irrigation levels, concluding that the crop was not economically viable if grown as a mono crop and that commercial production was only possible with considerable inputs. The analysis said further research was needed, and recommended further investigation of jatropha's potential as an energy source at the village level[40].

As well as promising income generation, jatropha plantations have been promoted as a potential source of employment. Although the crop is considered to be low-maintenance, planting and harvesting are labour intensive, with seeds needing to be picked by hand.

A study by the Overseas Development Institute (UK) found that one hectare of jatropha required 153 days of labour in the first year (planting), 29 days for weeding, replanting, irrigation and adding fertiliser in year two, just 9 days for weeding, irrigation and fertiliser in year three. Once the plants reached maturity, more labour was required for harvesting (with on-going weeding, watering and fertiliser application), adding up to 27.75 days in years four and five and 46.5 days in the following years[41].

Although the figures show employment opportunities, particularly in the initial year, the work is intermittent.

The ODI study suggests that given the current market prices for biodiesel, jatropha is unlikely to provide the mainstay of people's livelihoods in India, suggesting that it is not really a viable source of employment. The study adds that jatropha could potentially provide a supplementary source of income for farmers if used for hedging, boosting income.

39 Biodiesel Conference Towards Energy Independence – Focus on Jatropha, Papers Presented at the Conference, June 2006 http://biodiesel.nedfi.com/media/download_gallery/spland%20presentation.pdf (p18)
40 Biodiesel Conference Towards Energy Independence – Focus on Jatropha,Papers Presented at the Conference, June 2006 http://biodiesel.nedfi.com/media/download_gallery/spland%20presentation.pdf (p35)
41 ODI Report to the Renewable Fuels Agency, Review of the indirect effects of biofuels: Economic benefits and food insecurity, June 2008, p52

4

The study concluded that while biofuel production could have important direct and indirect impacts on poverty alleviation, "given the rather slow development of biofuel production in India, it is too early to assess the direct income and employment benefits and improved energy access for the poor"[42].

Banks are playing a crucial role in funding the spread of jatropha. Deals with companies promoting jatropha allow farmers to borrow money to establish jatropha plantations. The company guarantees a market for the jatropha seed, but if the crop fails, the farmers have no way of repaying the loan.

The reality of farming jatropha in India varies from state to state, with jatropha planting being promoted on forest lands, public lands, for inter-cropping and as plantations on farmland.

But there is a growing body of evidence suggesting that jatropha is not living up to the hype.

One farmer told a National Consultation on biofuels, organised by NGOs[43]:"Farmers are lured into growing Jatropha by enticing offers of low interest loans, agreements with companies guaranteeing the purchase of the produce, commission and bonus on the selling profits, and the promise of an assured income while sitting at home. When all these assurances do not materialize and the companies which were supposed to procure the produce vanish, the farmers are left in a quandary. Debt ridden, they are forced to sell their lands."

Companies are also benefiting from cheap access to "common" and "waste" land, leased to them by the state at nominal rents.

## 4.2. Food or fuel?

Jatropha is a non-food crop that can grow on land that is not suitable for food production, but it will also grow on marginal and more cultivable land. The Indian government has targeted "waste land" and degraded forest lands for jatropha cultivation, seeking to avoid competition with food, but forests and marginal land can be a crucial source of food.

An analysis of "wasteland" in India (see table below) shows that in fact much of the land officially classified as wasteland is not suitable for any form of cultivation, including jatropha. Those areas which could be cultivated are predominantly covered by degraded forests, and degraded pasture land.

Many of the forests being targeted are found in areas where there is little agricultural productivity, often in dry or hilly areas. In some of these areas, a third of the population are officially below the poverty line. More than half of the forest dwellers are tribal people[44].

In these areas, shared community resources (known as common pool resources -CPRs), such as village forests and commons, provide food, fuel and timber for many of the poorest rural communities. A state appraisal of the value of the forests recognised that some 100 million forest dwellers depended on the forests for these resources[45]. Many of these people subsist through small scale farming and animal grazing.

**table 1. Analysis of "wasteland" in India**

| | Wasteland categories | | Area covered |
|---|---|---|---|
| 1. | Gullied and/or Ravinous land | Not suited for cultivation | 20563.35 |
| 2. | Land with or without scrub | Potentially suited for cultivation | 194014.29 |
| 3. | Waterlogged and marshy land | Not suited for cultivation | 16568.45 |
| 4. | Land affected by salinity/alkanity-coastal/inland | Not suited for cultivation | 20477.38 |
| 5. | Shifting cultivation area | Potentially suited for cultivation | 35142.20 |
| 6. | Under utilized/degraded notified forest land | Potentially suited for cultivation | 140652.31 |
| 7. | Degraded pasture/grazing land | Potentially suited for cultivation | 25978.91 |
| 8. | Degraded land under plantation crop | Potentially suited for cultivation | 5828.09 |
| 9. | Sands-inland/coastal | Not suited for cultivation | 50021.65 |
| 10. | Mining/industrial wasteland | Not suited for cultivation | 1252.13 |
| 11. | Barren rocky/stone waste/sheet rock area | Not suited for cultivation | 64584.77 |
| 12. | Steep sloping area | Not suited for cultivation | 7656.29 |
| 13. | Snow covered and/or glacial area | Not suited for cultivation | 55788.49 |
| | | | **Total 55788.49** |

**Taken from:** *Landsat Thematic Mapper/ IPS LISS 11/111 Data*

42 ODI Report to the Renewable Fuels Agency, Review of the indirect effects of biofuels: Economic benefits and food insecurity, June 2008, p64
43 National Consultation on "Bio"fuels in India, Will they Deliver or Destroy, December 2007, p43
44 State of the Forest Report 2003
45 Planning Commission mid-term appraisal of the 9th Five Year Plan

# The social, economic and environmental impacts of jatropha

Using this land for jatropha cultivation could threaten the way of life of some of India's poorest communities - under-mining the pro-poor intentions set out by the government.

"Taking away their cultivable land, CPRs and grazing and pasture lands will mean denying them access to food and allied livelihood resources, pushing them to extreme poverty and a crisis of food security," according to Gautam Bandyopadhyay of Nadi Ghati Morcha, a grassroots campaign group based in Chhattisgarh[46].

The UK's ODI study highlighted that if jatropha became more profitable, it would also become more attractive as a crop, potentially displacing even more food supplies: "The food versus fuel debate has been side-stepped in the Indian biofuel development plans but could re-emerge if jatropha cultivation becomes profitable for small farmers displacing food crops on arable lands. Jatropha cultivation could also intensify the competition for water between cash crops and food crops."[47]

Agricultural expert and campaigner Vandana Shiva states that the transfer of commons and grazing lands from providing fodder to livestock in the local economy to providing fuel for automobiles of the rich will further erode rural livelihoods and increase social tensions[48].

Jatropha planting has been encouraged in the forests of Madhya Pradesh, Orissa, Andhra Pradesh, Rajasthan and Maharashtra, which account for almost 50 per cent of India's recorded forest area[49].

In these areas roughly one-third of the population lives below the poverty line. The regions are prone to drought, with a dry, semi-arid climate, but a large proportion of the population, including those dependent on forests, depend on agriculture for their livelihoods.

## 4.3. Farmer suicides

Small-scale and subsistence farmers in India struggling to cultivate cash crops are recognised as being particularly at risk of suicide. India has a relatively high level of farmer suicides – most often attributed to high levels of debt and crop failure.

Some 17,000 Indian farmers ended their own life in 2006 according to the National Crime Record Bureau[50]. Many of the areas being targeted for jatropha are home to a high level of vulnerable subsistence farmers – and suicide rates are particularly high.

In the state of Maharashtra, the region with the highest number of suicides, government data suggests debts, crop failure and dependence on one crop were common factors for many of the farmers taking their own lives.

***"Our village Panchayat planted jatropha on our common land as part of the government policy. The government gave us saplings and money for planting. Now, after two years, barely 25 per cent of them are surviving."***

**Chundu Ram Sahoo, Dy. Sarpanch, Dhanora, Durg**

Contract farming – where private companies pay farmers to grow a crop for them – leave farmers particularly vulnerable to crop failure and loss of income. Contract farming arrangements for jatropha are common in some parts of India, including in Maharashtra.

46 http://isf2006.wsfindia.org/organisation_profile_forlist.php?orgains_id=2461
47 ODI Report to the Renewable Fuels Agency, Review of the indirect effects of biofuels: Economic benefits and food insecurity, June 2008, p64.
48 Vandana Shiva, Manu Shankar, Biofuel Hoax: Jatropha and Land Grab, Navdanya, 2008 .
49 State of the Forest Report, 2003.
50 Provisional figures.

# Displacing farmers and families - the evidence from chhattisgarh

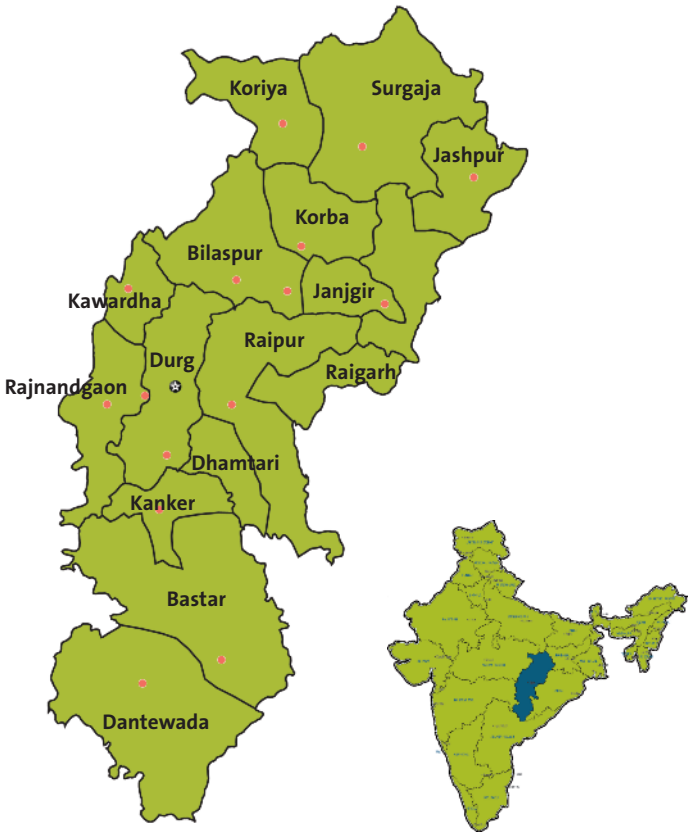
5

© Ajay Shukla

*Bihari Singh in front of his house in Ghota which was cut off from his own land by a cattle protection fence.*

# Displacing farmers and families - the evidence from chhattisgarh

figure 1. **State of Chhattisgarh**




The state of Chhattisgarh has embraced jatropha with plans for one million hectares state-wide by 2012. In 2006, the former Indian President APJ Abdul Kalam Azad declared on a visit that the state was at the forefront of biodiesel production from jatropha and the state government responded by welcoming him to the "land of jatropha".


*Bittal Tarak, villager, Sunderkera, Raipur district.*

> ***"While our former President inaugurated the first jatropha plantation in Chhattisgarh in Sunderkera village, 18 families were dispossessed of their land. We wanted to register our protest with the President Abdul Kalam Azad on that day. But, we were prevented by his security, and we could not approach him. We have filed a case in the local court demanding restoration of our land. The case is still going on."***
>
> **Bittal Tarak, villager, Sunderkera, Raipur district**

Chhattisgarh is traditionally a rice-growing area where 45 per cent of the population lives below the poverty line. Some 40 per cent of the state is forest and more than 44 per cent of the people depend on forests for their livelihoods.

This enthusiasm for jatropha from the state government was not supported by everyone. Social leaders and people's groups responded to the President's visit by sending an open letter, entitled: "The Rice Bowl or Land of Jatropha: the patriotic people of Chhattisgarh would decide".

The letter raised concerns that some of the poorest people in Chhattisgarh – the tribal adivasis and the lower caste dalits – would be forced from the lands which they had farmed and relied on, under common property rights.

There appears to be a clear-cut conspiracy to uproot and displace hundreds of thousands of adivasis, dalits, farmers from their common property resources by planting Jatropha on public land, revenue and forest land under the "Politics of Jatropha".

The task of implementing Chhattisgarh's jatropha plans has primarily fallen to the forest department and the forest development corporation which are responsible for planting on land officially classified as "forest". In Chhattisgarh this includes areas which are recognised as community land (CPR).

The UK company D1 Oils, which has a joint venture with Indian company Williamson Magor, is also growing jatropha in the state, with farmers under contract.

Jatropha saplings have been planted across a number of villages in the state, resulting in a number of complaints about loss of land.

In the village of Bhumia, 25 acres of forest-department owned grazing land was planted with jatropha saplings but these were trampled by cattle, according to the village chief. The land was replanted and a fence erected, using subsidised labour from the National Rural Employment Development Scheme.

# 5

In June 2007, the village assembly (panchayat) in Hansda village planted jatropha on 40 acres farmed by 20 dalit families from the village. The dalit families claimed that a herd of cattle was let loose on their existing crops and then jatropha saplings were planted.

"They used bulldozers to destroy our crops and the land", said Ajit Ekka, whose family depends on the two and a half acres of agricultural land for food. Ajit is a social activist and mobilized the dalit families to uproot the saplings. They filed complaints with the District Collector, Chief Minister and Governor of the State, who ordered an immediate enquiry.

***"I am mobilizing women of the surrounding 10 villages to raise their voices against jatropha plantation on our cultivable land."***

**Ajit Ekka, Hansda village**

As a result of the resistance, two cases have been filed against the 20 families – one by the forest department for uprooting the jatropha saplings and the other for encroaching on government lands. The families paid fines ranging between Rs500 to 1500 and the case for uprooting was then withdrawn. The other case is on-going, with the court requiring evidence of their land rights from the (higher caste) village assembly before the land can be restored to the dalit families. The dalit families believe this written agreement is unlikely to be granted.

The Tribal Welfare Society has recorded accounts of tribal villagers being beaten and arrested when they have tried to prevent jatropha from being planted."

Incidents of such forcible planting of jatropha by the forest department have happened in at least five districts of Kawardha, Bilaspur, Korba, Kanker and Rajnandgaon," said Pravin Patel of Tribal Welfare Society.

***Forest department forcibly planted jatropha on our lands. 45 of us, including women, resisted and were arrested by the police. A case of encroachment of forest land was filed against us. It is two years now that we are fighting the case and have to attend the hearing every month in the Sub-Divisional Magistrate Court.***

**Phool Singh Dhanwar, Kekradih, Bilaspur**


*Phool Singh Dhanwar, Kekradih, Bilaspur.*

***My husband's land was taken over by the forest department to develop a nursery for jatropha saplings. He was paid only as a caretaker of the nursery.***

**Sonsai, Bugbur, Bilaspur**


*Ajit Ekka, Hansda village.*


*Sonsai, Bugbur, Bilaspur.*

# Displacing farmers and families - the evidence from chhattisgarh

Many of the villagers filing these reports are from the Baiga community, a primitive tribal group, living in the forest regions of Chhattisgarh and Madhya Pradesh. Many of these communities depend on growing staple foods such as kodu, lentils and paddy where they have access to cultivable lands, as well as tending cattle.

Often villagers are not consulted about the plantations and have no warning.

***"I lost 5 acres of my cultivable land. The forest officials came in July 2007 and took away my land for jatropha plantations. How can I resist the Government? I am a poor man surviving on subsistence farming."***

**Bairag Singh, Pandripani, Bilaspur**

According to a villager from Baridih: "The local forest officials, usually forest guards and deputy ranger, accompanied by the Sarpanch (the elected head of the village), come with a big herd of cattle, which runs amok over their crops, trampling them down and destroying them totally."

In his village, the Baiga's kodu crop was destroyed by cattle and jatropha planted in its place in August 2007. The whole area was then planted with jatropha saplings, but the Baigas fought back, uprooting the jatropha saplings. They then filed a complaint with the local police.

Protesting villagers in Belgahona, Konochara, Mithtu Nawagaon were beaten up by the forest guards and arrested by the police.

Paribartan, an NGO working with tribal people in the Kanker and Bastar districts of Chhattisgarh reports that some 355 families from 27 villages in those districts had been displaced from their land because of forcible planting of jatropha.


*Buddha Ram, a Baiga, whose crops were destroyed.*

According to Ratneshwar Nath from Paribartan: "More than seventeen hundred acres of land cultivated by the tribals for generations, have been taken away from them for planting jatropha."

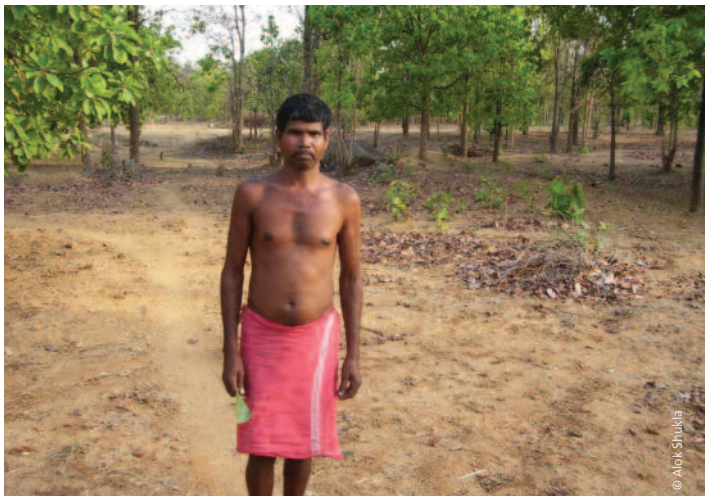
He added that forestry department officials were terrorising the villagers.

In some cases, villagers are prevented from accessing their lands because the forestry officials build cattle protection trenches to prevent livestock trampling the saplings.

***During the rains in 2007, the Deputy Ranger came and ordered planting of jatropha saplings on our land. Around 15-20 acres of land were forcibly taken away from 15 of us. The plants have not survived but still we are not able to reclaim our land. The Deputy Ranger has threatened us with arrest.***

**Sukhman, Chiunranj, Kanker**


*Bairag Singh, Pandripani, Bilaspur.*




*Sukhman, Chiunranj, Kanker.*

# 5


*Bihari Singh in front of his house in Ghota which was cut off from his own land by a cattle protection fence*

According to Alok Shukla from an organisation representing forest communities in Chhattisgarh: "It is not that the forest department here is simply over zealous to plant jatropha on as much land as they could lay their hands on, it is much more insidious and planned. The tribal and dalit forest dwellers in Chhattisgarh are in possession of these lands for generations; their ancestors and forefathers have been living on these lands and cultivating subsistence crops. But, they were never given any land entitlements even though there were bitter struggles for rights over forest lands."

The Indian Parliament passed new legislation recognising the rights of traditional forest dwellers in 2006[51], but Alok Shukla believes the Forest Department are reluctant to conform with the new legislation and is using jatropha to take back control of forest lands.

**table 2. The number of displaced families and land forcibly acquired for jatropha plantation in Kanker and Bastar districts of Chhattisgarh**[52]

| Name of village | Name of Panchayat | Forest Division | District | No. of displaced families | Land acquired for jatropha(in acres) | Land in possession for years |
|---|---|---|---|---|---|---|
| Ghota | Ghota | Bhanupratappur (East) | Kanker | 04 | 17 | 22 |
| Bayanar | Dongarkatta | -do- | Kanker | 03 | 09 | 18 |
| Chichgao | Chichgaon | -do- | Kanker | 04 | 13 | 30 |
| Uchpani | Dongarkatta | -do- | Kanker | 04 | 17 | 25 |
| Pandaripani | Faraskot | -do- | Kanker | 05 | 21 | 35 |
| Narayanpur | Narayanpur | -do | Kanker | 04 | 08 | 28 |
| Hapra | Bheja | -do- | Kanker | 05 | 27 | 30 |
| Kudal | Bheja | -do- | Kanker | 08 | 22 | 25 |
| Karmotii | Karmoti | -do- | Kanker | 01 | 05 | 10 |
| Huva | Huva | -do- | Kanker | 08 | 18 | 18 |
| Bhurkalkurum | Hahalddi | -do- | Kanker | 15 | 62 | 30 |
| Hilchur | Damkasha | -do- | Kanker | 10 | 70 | 35 |
| Taraighotia | Taraighotia | -do- | Kanker | 05 | 32 | 25 |
| Huripinjori | Barepinjori | -do- | Kanker | 04 | 20 | 35 |
| Maram | Barepinjori | -do- | Kanker | 02 | 05 | 40 |
| Barepinjori | Barepinjori | -do- | Kanker | 03 | 23 | 30 |
| Gondlapani | Choria | Kanker | Kanker | 40 | 180 | 10 |
| Tilaibhari | Mandabhari | -do- | Kanker | 85 | 510 | 12 |

51 The Scheduled Tribe and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2005.
52 Data provided by Parivartan, Kanker.

# Conclusion

6

Rising energy prices, growing demand and a high dependence on imported fuels launched India's rush into biofuels, resulting in a widespread drive for jatropha, despite limited research into its viability as a biofuel crop.

Following the initial lead by the national Planning Commission, a number of states have provided financial and policy support to encourage jatropha cultivation, resulting in widespread planting of the crop.

In some regions, this has been driven by the state, with the Forest Department in particular playing an important role in key states such as Chhattisgarh.Elsewhere, state authorities have formed partnerships with research institutes, NGOs and private companies to promote and encourage jatropha.

The drive for jatropha has seen a number of national and international companies investing in jatropha, encouraging farmers to plant seedlings with financial loans, guaranteed buy-back and promotional schemes.

In some areas this has led to land conflicts, with jatropha planted without consultation on common lands traditionally used for livestock grazing and subsistence farming by some of India's poorest communities, leaving them at even greater risk of food shortages and insecurity.

Tribal people, often among the rural poor, have been forced off land they have traditionally farmed, their land rights ignored, to make way for jatropha plants.

The promotion of jatropha is compromising the rights of India's rural communities to access common resources, to grow their own food and feed their families. In some cases control of the land is being handed over to corporations, depriving local people of food in the name of profit and energy security.

Yet the enthusiastic fervour for the crop has brought little in return, as a poor awareness and understanding of the optimum growing conditions have meant that many crops have failed to thrive.

More research is still needed to understand the potential for jatropha but evidence suggests that it is unlikely to be viable commercially if grown in monoculture plantations.

Grown as a monoculture, there is a risk that as with so many other monoculture farming systems, successful harvesting will depend on expensive inputs that ultimately deplete the soil quality and pollute the water supply.

It is highly questionable what role biofuels can make to the energy needs of India. The rush to plant jatropha does not appear at this stage to have been well thought out and the most vulnerable in society have been hit the hardest. Real solutions to the energy and climate crisis are needed that truly help raise India's rural communities out of poverty. Instead of being the saviour, jatropha is becoming a threat to the rural people it was supposed to benefit.



*Jatropha plantation on previous common land, Baridih village, Chhattisgarh.*

## Friends of the Earth Europe member groups

**Austria** Global 2000
**Belgium** Les Amis de la Terre
**Belgium (Flanders)** Voor Moeder Aarde
**Bulgaria** Ecoglasnost
**Croatia** Zelena Akcija
**Cyprus** Friends of the Earth
**Czech Republic** Hnutí Duha
**Denmark** NOAH
**England, Wales and Northern Ireland** Friends of the Earth
**Estonia** Eesti Roheline Liikumine
**Finland** Maan Ystävät Ry
**France** Les Amis de la Terre
**Georgia** Sakhartvelos Mtsvaneta Modzraoba
**Germany** Bund für Umwelt und Naturschutz Deutschland (BUND)
**Hungary** Magyar Természetvédok Szövetsége
**Ireland** Friends of the Earth
**Italy** Amici della Terra
**Latvia** Latvian - Vides Aizsardzibas Klubs
**Lithuania** Lietuvos Zaliuju Judéjimas
**Luxembourg** Mouvement Ecologique
**Macedonia** Dvizhenje na Ekologistite na Makedonija
**Malta** Moviment ghall-Ambjent
**The Netherlands** Vereniging Milieudefensie
**Norway** Norges Naturvernforbund
**Poland** Polski Klub Ekologiczny
**Scotland** Friends of the Earth Scotland
**Slovakia** Priatelia Zeme - Slovensko
**Spain** Amigos de la Tierra
**Sweden** Miljöförbundet Jordens Vänner
**Switzerland** Pro Natura
**Ukraine** Zelenyi Svit

Friends of the Earth Europe

for the people | for the planet | for the future

*Friends of the Earth Europe*
Mundo-b building, Rue d-Edimbourg 26,
1050 Brussels, Belgium
tel: +32 2 542 0180 fax: +32 2 537 5596
e: info@foeeurope.org **www.foeeurope.org**