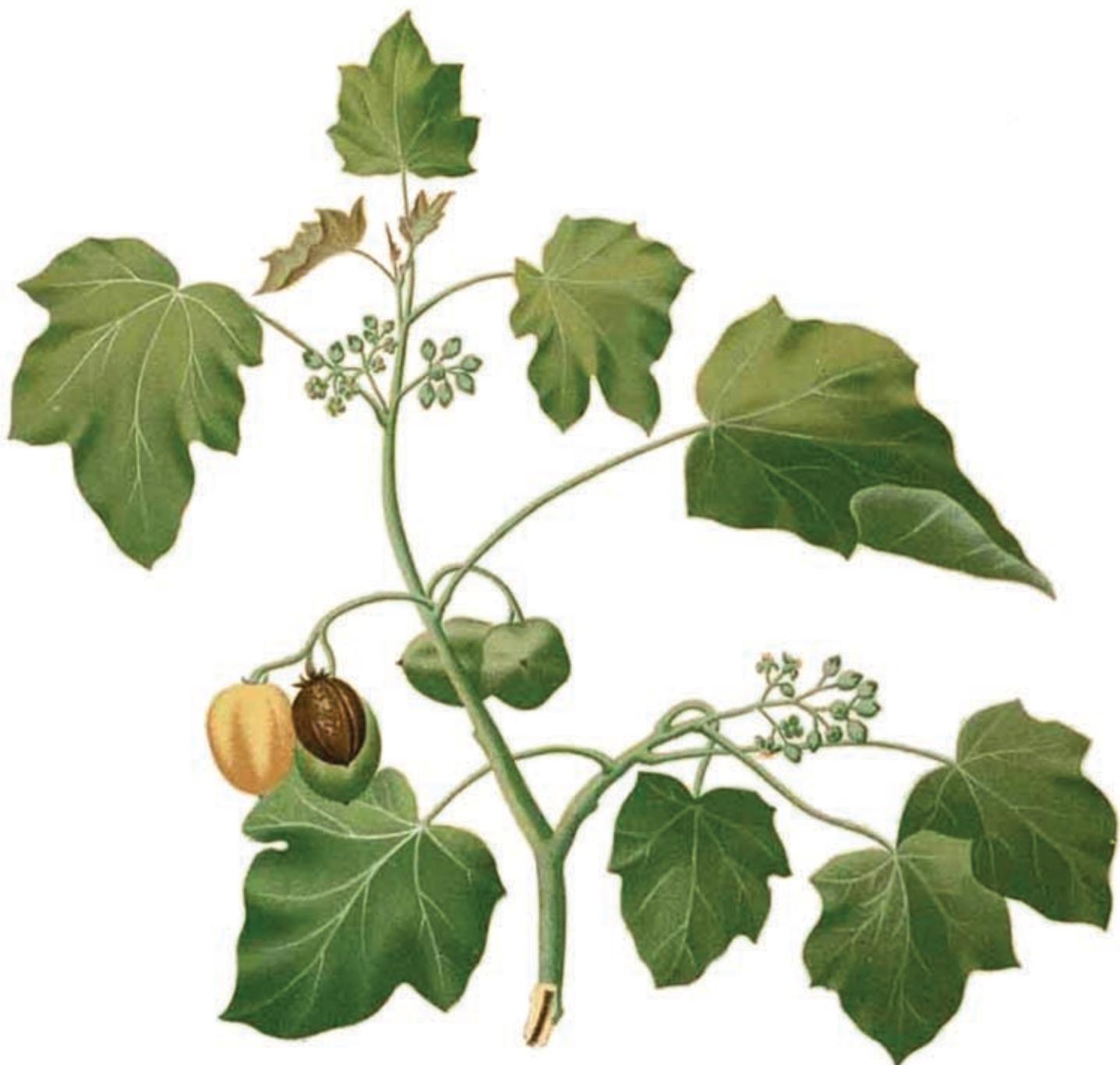


# Jatropha: wonder crop?

**Experience from Swaziland**



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Written by Helen Burley and Hannah Griffiths for Friends of the Earth  
Editorial team: Adam Bradbury, Anthony Loizou  
Graphic Design: Mario Stifano

# EXECUTIVE SUMMARY

The search for alternatives to fossil fuel has seen a rush towards biofuels. This is contributing to rising food prices and increasing concern about our ability to grow enough food and fuel. Despite social and environmental concerns and unproven climate benefits of biofuels, the EU has set a target of 10 per cent road of transport fuel to come from biofuels by 2020.

Against this backdrop, jatropha (*Jatropha curcas*) has been promoted by UK biofuel company D1 Oils as a wonder crop because of the plant's ability to grow on marginal and semi-arid land, saying "it will not compete with food crops for good agricultural land".<sup>1</sup>

Local non-government organisations (NGOs) have raised concerns about the social and environmental impacts of jatropha and studies have questioned some of the claims made about jatropha's benefits. This report highlights those concerns for media and policy makers and questions some of the claims being made by D1 Oils and others for biofuel from jatropha.

This report looks at D1 Oils' activities in Swaziland, one of the countries where the company is leading the development of jatropha plantations. The report is based on first-hand evidence from farmers involved with D1 Oils and desk research on the impacts of jatropha. By revealing major problems with jatropha production as a biofuel crop, this report poses questions for policy makers who are relying on the plant as a part of a future sustainable biofuel mix.



## SUMMARY OF CONTESTED CLAIMS

### Grows well on marginal land?

A key D1 Oils claim about the benefit of jatropha above other biofuel crops is that it grows well on “marginal” or “waste” land and so does not compete with food production. Swazi NGOs, however, have documented cases of farmers turning good quality land over to jatropha cultivation under contract by D1 Oils, instead of that land being used to grow food crops for people who lack food security. Written studies back up these concerns. For example, the Gallagher Review, a comprehensive report by the Renewable Fuels Agency<sup>2</sup> analysing the indirect effects of biofuels production, finds that without regulation there is nothing to prevent crops like jatropha from being grown on high-quality arable land.

**High yields on poor soil?** Linked to the marginal land issue, a second supposed key benefit of jatropha is that it yields a high oils content even on poor quality soil. However, studies show considerable variation in the potential oil yield for jatropha, with much higher yield indicated when it is grown on better-quality soil. Swazi NGOs have documented farmers complaining that the jatropha isn't growing well in drought conditions. Other studies back up these concerns. For example, the Overseas Development Institute (ODI) suggests that jatropha is unlikely to deliver the promised yields if grown only on marginal land.

**Low water use – biofuels grown in drought conditions?** It is claimed by the biofuels industry that it possible to grow jatropha in the desert and D1 Oils is currently carrying out research in Saudi Arabia. In Swaziland, however, some farmers are complaining that jatropha needs to be watered once or even three times a week and that water collection for jatropha crop is competing with collection for domestic use such as cooking and sanitation. No full studies have been carried out on the overall impact of on water levels of intensive jatropha cultivation, but evidence suggests that jatropha will not thrive unless irrigated.

### Noxious and invasive – is jatropha safe?

Although jatropha has been planted for many years in Swaziland for use as hedges and soap, it is classified as an invasive species and a noxious weed in other countries for containing carcinogenic substances and presenting a significant human and animal health risk.<sup>3</sup>

**Resistant to disease?** Swazi NGOs have documented cases of farmers who have reported problems with pests even though farmers say D1 Oils told them they wouldn't need pesticides. Because jatropha has never been used as a commercial crop before, there is no local knowledge about how to control pests and farmers have complained that D1 Oils has refused to help them.

**Environmental risk?** In April 2008 the government of Swaziland suspended all further planting as no environmental risk assessment had been undertaken over jatropha planting.

**Development opportunities for poor communities?** More than 80 per cent of the Swazi population depend on subsistence farming and many have suffered because of the severe drought in recent years. D1 Oils has said that rural communities will significantly benefit through jatropha planting. Evidence of farmers enriched by jatropha cultivation is hard to find, however. Studies have found that jatropha is only likely to be viable as a small-scale crop and the ODI has said that it looks unlikely to be a mainstay of people's livelihoods. The potential of jatropha for poor communities is also linked to whether claims about yields on marginal land are realised, yet, as noted above, these claims are contested.

**A fair deal for farmers?** Swazi NGOs have raised concerns over the contracts issued to farmers by D1 Oils. These include that farmers could not read or understand the contracts, that they were not left copies of the contract and that the contracts cannot be terminated for several years.

### Energy sovereignty for Swaziland? D1

Oils has said that by planting jatropha, Swaziland could be producing its own biodiesel. However, under current legislation, any biodiesel produced cannot be distributed in Swaziland and will be exported.

This report concludes that jatropha is not likely to be a silver bullet that will help the UK and EU meet their biofuel targets sustainably or solve the world's energy needs. The oil yield from jatropha when it is grown on marginal or waste land with no water, fertiliser or pesticide input is at best uncertain. The high yields needed to make jatropha commercially viable as a biofuel crop are far more likely to be obtained when it is planted on fertile irrigated land. This could mean that widespread jatropha plantations for biodiesel compete with food production for fertile agricultural land.

While jatropha is not a food crop, the use of the plant for biofuels still raises issues about competition with land use and food production. The experience from Swaziland, backed up by various scientific studies, implies that policy makers in the EU and UK need to treat jatropha with the same degree of rigour as other biofuel crops.

# RECOMMENDATIONS

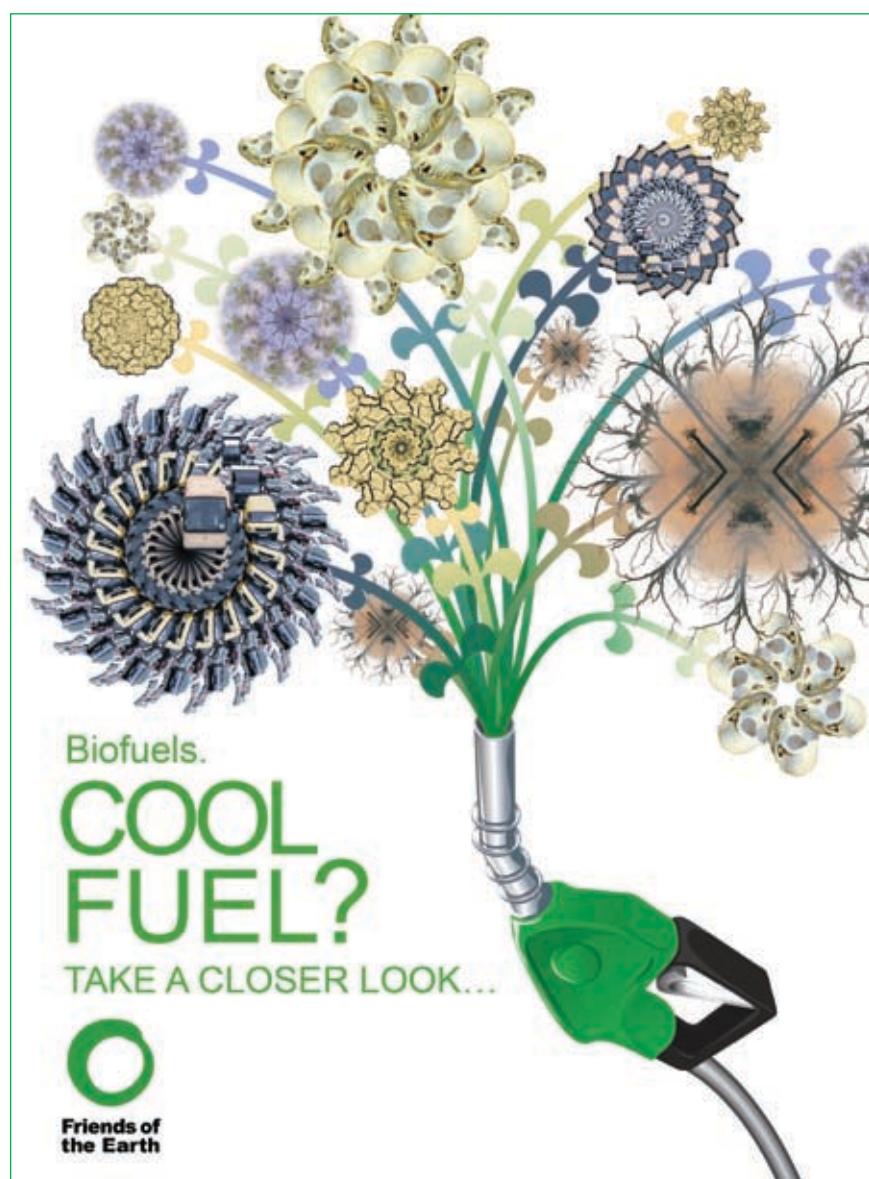
- The European Commission must include a thorough analysis of jatropha in its 2010 report on indirect land use change due to biofuel production;
- The UK Government to carry out an urgent review into the current impacts of biofuels in developing countries for crops such as jatropha.
- The EU and UK should put biofuel targets on hold until it can be proven that they can be met sustainably. Jatropha cannot currently be considered a sustainable biofuel crop because its supposed benefits are unproven.
- Instead, emissions from road transport should be reduced through a combination of measures proven to be effective. The Government-commissioned study "Looking over the horizon" has demonstrated that emissions from transport could be reduced by 60 per cent by 2030 through a combination of transport policy measures that are proven to deliver effective greenhouse gas reductions.<sup>4</sup> For example, measures to boost walking and cycling could save 7.3 million tonnes of carbon dioxide per year.<sup>5</sup>

If UK speed limits were lowered we could reduce emissions by as much as 5.4 million tonnes of carbon dioxide a year as well as improving our energy security and saving lives.<sup>6</sup> If European politicians made manufacturers double the average fuel efficiency of new cars it could save 95 million tonnes of carbon dioxide a year across the EU.<sup>7</sup>

- The UK Government and the EU should heed the warnings of the Gallagher Review and ensure that

there is an appropriate regulatory framework in place to ensure that biofuels produced from jatropha are not competing with food production.

- In line with the principles of corporate responsibility, and in order for the directors of D1 Oils plc to meet their obligations under section 172 of the Companies Act 2006, D1 Oils should cease all jatropha biofuel production and conduct a comprehensive review of the direct and indirect environmental and social impacts of that production.



# INTRODUCTION

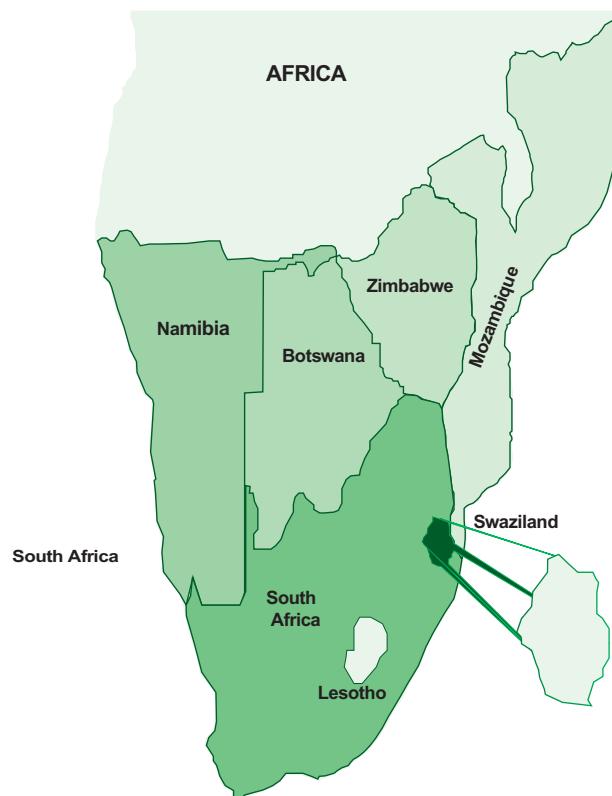
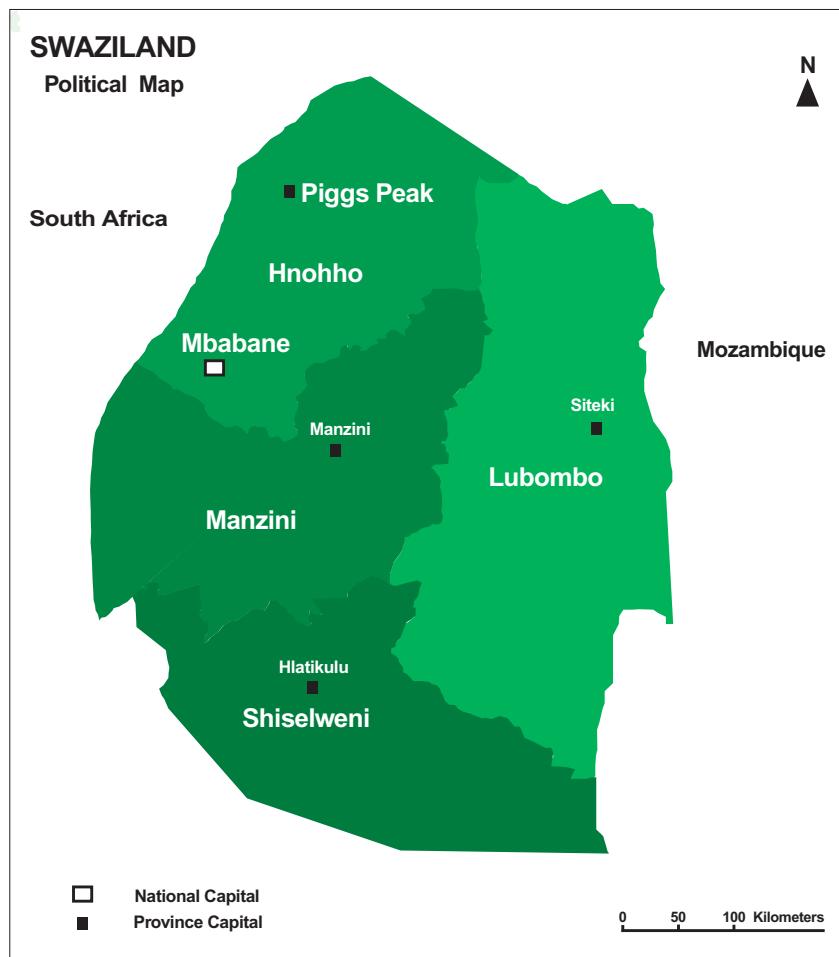
The search for alternatives to fossil fuel has seen a major rush towards biofuels, contributing to rising food prices and growing concern about our ability to grow enough food and fuel. Against this backdrop, jatropha has been promoted by D1 Oils as a "wonder crop" because of its ability to grow on marginal and semi-arid land.

Jatropha originates in South America but has been introduced widely to Asia and Africa, where it is traditionally used for hedges and oil from the seeds are used for soap. Jatropha, the variety being promoted for biofuel, is a bushy shrub that produces seeds which contain a non-edible vegetable oil that can be used for biodiesel.<sup>8</sup>

UK-based company D1 Oils was among the first to market jatropha's supposed advantages. It has developed partnerships in South East Asia and Africa to encourage farmers to grow jatropha, and is widely seen as a world leader in the jatropha trade.

Jatropha is particularly suited to tropical conditions and a number of countries are embracing the so-called miracle crop. India has said it intends to develop 11 million hectares of jatropha and China claims to have 2 million hectares and plans 11 million more. In Africa, jatropha plantations are spreading across Tanzania and Zambia, and, despite a current government suspension of planting of jatropha, Swaziland is poised to follow suit.

One of the key drivers behind this enthusiasm is demand for biofuels from Europe and the United States, promoted as a measure to tackle climate change. Despite social and environmental concerns and unproven climate benefits of biofuels, the EU has set a target of 10 per cent road of transport fuel to come from biofuels by 2020. Producers worldwide are gearing up to supply this demand. The rising price of petroleum and a desire for energy security are also spurring countries to look at the potential for domestic use.



# D1 OILS

A D1 Oils Jatropha plantation



## D1 OILS IN SWAZILAND

D1 Oils Africa Ltd is a subsidiary of D1 Oils that started operating in Swaziland in 2005. D1 Oils Africa Limited signed a Memorandum of Understanding with the Swazi Government in September 2006 to plant 20,000 hectares of jatropha in the country.<sup>17</sup>

Local NGOs Yonge Nawe (Friends of the Earth Swaziland) and Africa Co-operative Action Trust (ACAT) Swaziland have raised questions about the environmental impacts of jatropha, the impact on food supply and also about D1 Oils approach to farmers.

D1 Oils plc describes itself as a "biofuels technology company".<sup>9</sup> It has expanded rapidly, attracting worldwide media coverage and massive investment for jatropha, which the company has branded as a "wonder crop".<sup>10</sup>

D1 Oils believes that Jatropha will "potentially contribute strongly to the EU meeting its biofuel targets".<sup>11</sup> D1 Oils has also expounded the jatropha message in developing countries, saying the crop would deliver good oil yields on marginal and arid land unsuitable for agriculture, and could also be used as biomass to generate electricity<sup>12</sup>.

In December 2004 the company had up to 6 million hectares which it could access for jatropha biofuel production - an area twice the size of Belgium. D1 Oils' rapid global expansion has seen it enter into a number of partnership arrangements including with companies in Brazil, China, India, Indonesia, Saudi Arabia, South Africa, Swaziland and Zambia.

In February 2009 D1 Oils announced that through its joint venture with BP it had planted more than 257,000 hectares of jatropha, or around a quarter of the current world supply.<sup>13</sup>

Most of these plantations are not owned by D1 Oils, but represent the area planted with jatropha by independent farmers. The farmers have signed agreements where D1 Oils will buy the jatropha, and in some cases provide farmers assistance with seeds and seedlings.<sup>14</sup>

D1-BP Fuel Crops Limited, D1 Oils' joint venture with BP, took over responsibility for all D1 Oil's existing planting agreements<sup>15</sup> and now owns D1 Oils plc's plantations, with managed plantations in Zambia, Swaziland and Indonesia.

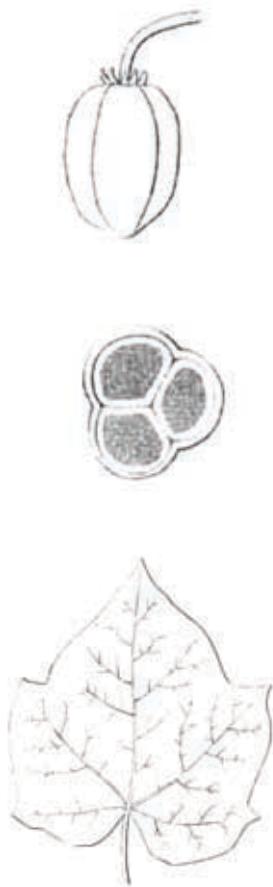
# EXPERIENCE FROM SWAZILAND

**"Because they are environmentally elastic and bring unproductive land into cultivation, alternative biofuel feedstocks such as jatropha have the potential to meet demand for biofuels without putting at risk food supplies or important carbon-rich or biodiverse environments."**

D1 Oils, Annual report and accounts 2007

D1 Oils and other proponents of jatropha are marketing the crop as a sustainable biofuel crop, without the widely publicised environmental and social impacts of other biofuel crops such as palm oil. Jatropha's supposed key benefits are that it can grow on so-called marginal or wasteland in water scarce conditions with little or no fertiliser or pesticide impact. D1 Oils presents jatropha as a key development opportunity enabling rural farmers to lift themselves out of poverty, while at the same time meeting a demand from developed countries for greener fuel which helps to combat climate change.

This section investigates the claims made by D1 Oils about jatropha biofuels in light of the experience of Swaziland.



Dreamstime

## GROWS WELL ON MARGINAL LAND?

"Developing countries have millions of hectares of land that is currently classified as marginal, waste or degraded. This includes land that was farmed in the past, but has fallen out of production and is no longer suitable for growing arable crops. Much of this land is suitable for growing energy crops such as jatropha." D1 Oils website<sup>18</sup>

In fact, studies challenge the viability of growing jatropha on waste lands. Research carried out by the Overseas Development Institute (ODI) as part of the UK Government's Gallagher Review found that the "promotional" claims made about jatropha were contradictory.<sup>19</sup> While the ODI found jatropha could grow on marginal land, it also found that jatropha would only produce high yields if grown in good soil in areas with good irrigation.

The question of land use for jatropha is crucial. Biofuel crops that displace food crops put a severe strain on food supplies, leading to rising prices and food insecurity. The ODI study notes, however, that if jatropha becomes more profitable, it will become more attractive for farmers as a crop, potentially displacing food supplies.<sup>20</sup>

D1 Oils argues that because jatropha grows on marginal land it does not take land away from food production. In Swaziland, however, some of the land being used for jatropha was until recently used for growing food.

"I have three fields. I used to grow cotton on the one which has irrigation and food crops on the other two. Then D1 Oils came and told us we could make lots of money from growing jatropha. So I decided to turn all my fields over to jatropha. But times are hard. Food prices are too high. My family are angry with me for planting jatropha and have told me I must use the fields to grow food crops again so that we won't go hungry. I want to pull out the jatropha but do not know what my contract says."

Sam Dube, subsistence farmer, Manzini Region<sup>21</sup>

Much of the so-called "waste land" being ear-marked for jatropha production in fact provides valuable grazing land and subsistence farm land for some of the poorest communities.

"I planted jatropha on two of my fields. The jatropha isn't growing well and I didn't know that I would have to wait three years before I'd start to be able to harvest the seeds and make money."

So now I want to start growing drought-tolerant food crops as the Minister for Agriculture has urged. But I have heard that the contract I signed with D1 doesn't allow me to stop growing jatropha for them. I don't know what to do."

Small Farmer, Swaziland<sup>22</sup>

The Gallagher Review warns that biofuel crops which can grow on marginal land, like jatropha, must be subject to regulation to ensure that they are not in fact grown on high quality arable land.<sup>23</sup>

D1 Oils also promotes the use of biomass from jatropha to generate electricity. According to Plant Research International, this would remove a "huge amount of nutrients" from the soil, reducing the soils fertility.<sup>24</sup>

Solomon Gamedze from Swaziland's Ministry of Agriculture told a meeting:

"As much as the Ministry welcomes the issue of biofuels if they can relieve the country of the ever escalating costs of fossil fuels, we should remember that only 10 percent of the land is arable, and we should be seen to be asking how much of that land can be sacrificed to Jatropha."<sup>25</sup>



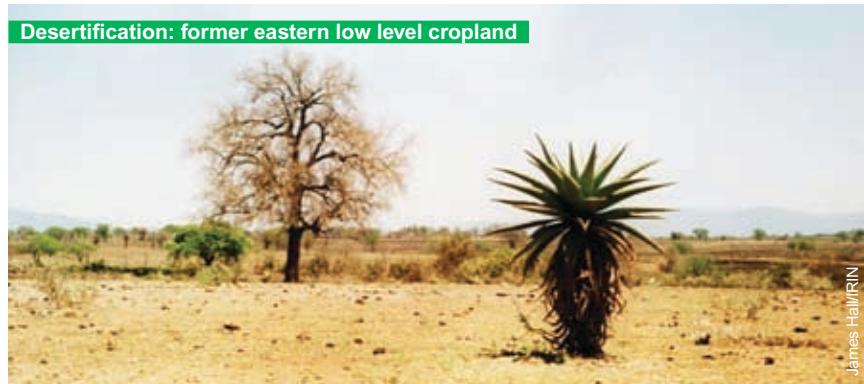
Yonge Nave

## HIGH YIELDS ON POOR SOIL?

"Under optimum conditions jatropha seeds can yield up to 40% oil content.<sup>26</sup>"

"The trees...can grow and survive with minimum inputs in marginal land..."

D1 Oils website<sup>27</sup>



Among the key benefits of jatropha, according to D1 Oils, is the good yield on poor soil. But studies have predicted far lower yields, especially on poor quality soil, and scientists and farmers have questioned whether high yields can be delivered.

In 2007 D1 Oils claimed that once the jatropha plant reaches maturity, jatropha has the potential to yield between 170 and 270 per cent more than rapeseed per hectare, and between 425 and 675 per cent more than soya per hectare. D1 Oils has also claimed: "In the longer term we believe yields for jatropha have the potential to approach those of palm<sup>28</sup>", with palm yielding at least twice that of rapeseed and soya.

But other scientific studies have found lower yields than those claimed by D1 Oils.

A study by Plant Research International at Wageningen University reported that there was little concrete data available on

large scale jatropha cultivation. Little is known about the different varieties and their comparative yields, making it "impossible" to predict future production on marginal land.<sup>29</sup>

The study reported considerable variability in yields according to the soil type, water level and level of care the plant received but said there was no evidence available to support claims of high oil yields.

Figure 1 summarises the results of some different studies on the oil yields of jatropha compared with the claims made by D1 Oils. The Indian Government's Planning Commission has promoted jatropha for biofuels, predicting yields of 1,300 litres / hectare. Yet Indian scientist and jatropha expert Pushpito Ghosh says a yield of half that amount is more likely.<sup>30</sup>

Professor KS Neelakantan from Tamil Nadu Agricultural University has studied yields under different conditions and reports that a hectare

of plants on poor rain-fed soil can be expected to produce 0.67 tonnes of seeds (equivalent to 287 litres of oil per hectare), while on normal or fertile irrigated soil, a hectare will produce 2.5 tonnes (equivalent to 1,070 litres of oil per hectare<sup>31</sup>). His studies also show that plants benefit from inputs, including 5kg of organic manure for every plant.

These findings are consistent with the conclusions of ODI's study mentioned above, which suggests that jatropha has limited potential as a fuel crop.<sup>32</sup>

Jatropha is unlikely to deliver the promised yields if grown only on marginal land, raising fundamental questions over the viability of jatropha as a farm crop and undermining D1 Oils' claims that jatropha can provide a sustainable source of fuel that does not compete with food.

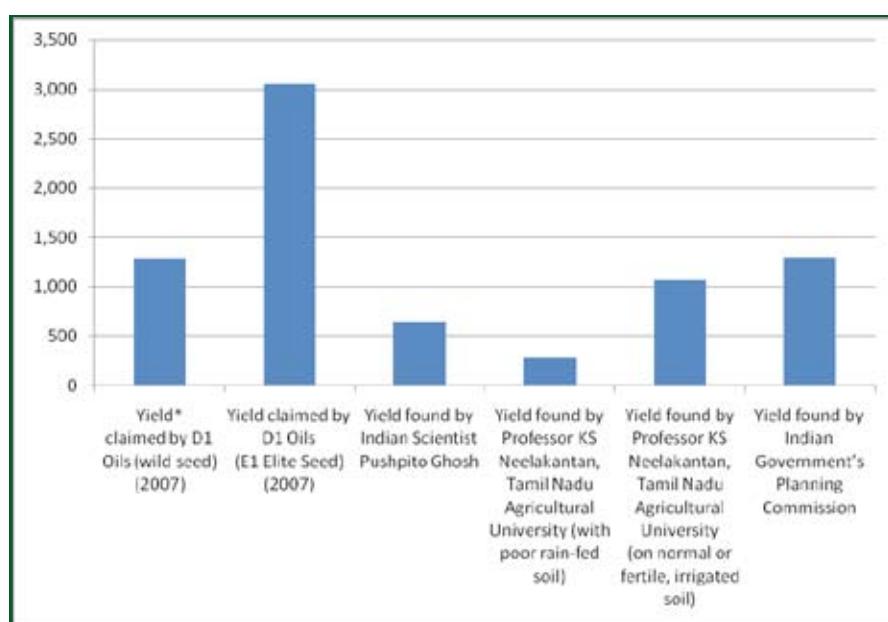


Figure 1



Friends of the Earth Swaziland

## WATER USE - BIOFUELS GROWN IN DROUGHT CONDITIONS?

D1 Oils has made much of jatropha's ability to grow in semi-arid areas, launching a partnership in Saudi Arabia to grow jatropha in the desert. But evidence suggests that jatropha will not thrive unless irrigated.<sup>33</sup>

While jatropha has traditionally been used to conserve water in the soil, with leaves providing shade and preventing evaporation, no full studies have been carried out on the overall impact on water levels of intensive jatropha cultivation.<sup>34</sup> Swaziland is water scarce. The persistent drought in the country has been declared a national disaster by the government, and there are concerns about using water to irrigate a crop for fuel when there is not enough water for daily life, let alone for growing food supplies. D1 Oils has made much of jatropha's ability to grow in semi-arid areas, launching a partnership in Saudi Arabia to grow jatropha in the desert. But evidence suggests that jatropha will not thrive unless irrigated.

Some farmers are frustrated because when they were given seedlings, D1 Oils told them that jatropha does not need a lot of water to survive. But experience shows that for jatropha to thrive it needs weekly watering.

*"My children wish I had not taken the jatropha seedlings. D1 Oils had said the jatropha wouldn't need water. But they need to be watered three times a week or they wither and die. Now I have to send my children to water these trees. I feel guilty because we are struggling to get water for domestic use and they have to walk long distances to fetch the water. This has set me against my children."*

Constance Dlamini, 45, small-scale farmer<sup>35</sup>

## NOXIOUS AND INVASIVE IS JATROPHA SAFE?

Jatropha is officially recognised as an "invasive species" in some parts of the world, including the United States, South Africa, Australia and Puerto Rico. The Global Invasive Species Programme has recommended that as such, it should not be used for biofuel production.<sup>36</sup>

The plant is classified as a noxious weed in Western Australia because of its toxic and invasive nature. The state's government warns that the oil produced from jatropha contains carcinogenic substances and presents a significant human and animal health risk.<sup>37</sup>

*"The man told us that a white man in Mbabane would pay us lots of money to grow this jatropha. But there is no way I will have it on my land. I used to use it as a hedge around my home. Then one day my three children had to be hospitalised after eating the fruit. When I mentioned this at the presentation by D1 Oils they denied that the plant was toxic."*

Zanele Dlamini,  
subsistence farmer, Hhohho<sup>38</sup>

## RESISTANT TO DISEASE?

"D1 Oils have neglected us, they tricked us into planting these trees, told us they were miracle trees that wouldn't need any inputs like expensive fertilisers and pesticides. But now we need pesticides and they can't help us. Where are we supposed to get money from for these expensive pesticides? And when they finally buy our seeds will they include the money I used for the chemicals? I am really disappointed."

Grower, Swaziland<sup>39</sup>

The Plant Research Institute study dismissed claims that jatropha is resistant to pests and disease, reporting that evidence from plantations shows problems with fungi, viruses and attacks by insects. Jatropha is vulnerable to a number of diseases including leaf spots, collar rot and root rot.<sup>40</sup>

Bayer CropScience is reportedly working on the development of herbicides, insecticides and fungicides for jatropha, in partnership with Daimler.<sup>41</sup>

Farmers in Swaziland have reported problems with pests. Jatropha is an unfamiliar species and has never been used as a commercial crop, which means there is no local knowledge of the pests it attracts or how to control them. This means that even the Swazi government department that advises farmers has no pest list for it and so is unable to give advice to farmers.

There are common complaints about a grasshopper-like insect which feeds on the plants, causing it to wither and die. One farmer reportedly asked D1 Oils for help with pesticides was told to buy it herself. She says she has no money to buy pesticides and so as a result the whole field was wiped out.

## ENVIRONMENTAL RISK?

"No environmental risk assessment has been undertaken over Jatropha, when it should have been put under a severe environmental scrutiny before it could be embarked upon. This is against the spirit of the Plant Control Act of 1981."<sup>42</sup>

Solomon Gamedze from Swaziland's Ministry of Agriculture

Some of the environmental concerns about jatropha were highlighted when, in April 2008, the Government suspended all further planting of jatropha until a strategic environmental assessment had been carried out. D1 Oils' planned high profile launch - with the King of Swaziland, Sir Bob Geldof and Bono reportedly scheduled to attend - was postponed.<sup>43</sup>

So far, around 2,000 farmers are believed to have planted around 3,000 hectares with D1 Oils jatropha seedlings in Swaziland. The change

of mood in Swaziland came amid growing concern globally about the impacts of biofuels on rising food prices, but there were also concerns within Swaziland about the impacts of jatropha cultivation.

South Africa has banned the commercial cultivation of jatropha because of uncertainty about its local environmental impacts. Priscilla Sehoole from the agricultural department said:

"Too many lessons have been learned at high cost when plants that promised to be solutions turned into environmental and social disasters for South Africa."<sup>44</sup>



## DEVELOPMENT OPPORTUNITIES FOR POOR COMMUNITIES?

"We believe that rural communities in Swaziland stand to benefit significantly from the increase in rural employment that we are facilitating through the planting of jatropha as an energy crop. Our operations have already created over 200 jobs in communities that previously depended on subsistence farming and we expect planting to create thousands of jobs in the long term."<sup>45</sup>

D1 Oils ex-CEO Elliott Mannis

The Swaziland venture was promoted as a development opportunity for struggling farmers. More than 80 per cent of the Swazi population depend on subsistence farming and have suffered as a result of the severe drought in recent years. Crops such as cotton, sugar cane and maize have failed and more than two thirds of the population now depend on food aid.<sup>46</sup>

D1 Oils offered free jatropha seedlings to farmers and told them they could expect returns of between £600-700 (£39 - £45) a tonne.<sup>47</sup> Development charity World Vision signed an agreement with D1 Oils to encourage jatropha planting. Other supporters include Sir Bob Geldof who has declared that jatropha has "life-changing" potential for poverty stricken African countries.<sup>48</sup>

Evidence of the rural farmers enriched by jatropha production is, however, hard to find. An analysis of the labour demands for jatropha cultivation in India found that while a hectare of jatropha would create some employment, this was sporadic, with a labour-intensive phase during planting (153 days in the first year), little labour needed during the second and third years, and intense labour required for harvesting once the plants reached maturity (27+ days in years four and five, 46+ days subsequently).<sup>49</sup>



Much of the Swazi population depends on food aid

"As a mainstay of people's livelihoods it looks distinctly marginal."

ODI Review of the indirect effects of biofuels: Economic benefits and food insecurity<sup>50</sup>

A number of jatropha experts have concluded that the crop has most potential as field boundary or planted alongside other crops, with the seeds used locally for soap production, for seedcake and a fuel oil.<sup>51</sup> Its potential as a cash crop is unproved.<sup>52</sup>

An analysis of the economic benefits of sugar cane, palm oil and jatropha by the ODI concludes that jatropha shows marginal economic benefits.<sup>53</sup>

The potential of jatropha as a key development opportunity for Swazi people also depends on whether it lives up to the claims being made for attaining high yields on non-crop land without competing with food crops or causing other environmental damage.

As noted above, these claims are contested and yields on land unsuitable for food production are far from certain.

As the International Institute for Environment and Development (IIED) and the Food and Agriculture Organisation (FAO) note in a report "gains in yields will not be spread equally. Africa did not benefit from the Green Revolution, with crop yields across the continent declining slightly during the 1970s and beyond. Yield increases are often confined to the large-scale farming sector, with smallscale producers unable to take advantage of new technologies and high cost inputs".<sup>54</sup>

## A FAIR DEAL FOR FARMERS?

Yonge Nawe and ACAT Swaziland have found that some of the farmers who were contracted to grow jatropha for D1 Oils had been asked to sign contracts in English, which they could not read or understand. The contracts were then taken away from them.

"The terms and conditions were not explained to them. To make matters worse, D1 Oils failed to leave them copies so they could seek legal guidance on where they stand... Furthermore, we have learnt that the contract ties the farmer for 10 years within which they are not permitted to destroy or uproot the jatropha.<sup>55</sup>"

Sicelo Simelane, Yongenaew told the Swazi Observer

Muzie Yende from ACAT explained this meant the farmers would be unable to rotate their crops in the normal way, reducing their capacity to grow food.

**"D1 Oils told us growing jatropha will make us rich. I am not sure what's in the contract as it was written in English and they didn't leave me a copy. I just signed because I needed the money."**

Titus Shongwe, 45, small scale farmer, Swaziland.<sup>56</sup>

D1 Oils project director in Swaziland, Rex Brown, has denied that farmers cannot terminate the contract if they wish to and told the media that contracts were now being interpreted for farmers, but farmers still do not have copies of what they have signed.<sup>57</sup>

## ENERGY SOVEREIGNTY FOR SWAZILAND?

D1 has said that by planting unused land with jatropha, Swaziland could be producing its own biodiesel, reducing its dependency on oil from South Africa.<sup>58</sup>

However, the reality is that it's more likely to be exported as under current legislation D1 Oils cannot distribute their biodiesel in Swaziland. D1 Oils aims to have 20,000 hectares of the plant by 2010, producing enough jatropha to justify building a refinery for local use.



Yonge Nawe community dialogue with subsistence farmers at Nkhomonye in the poverty stricken Shiselweni region

# CONCLUSIONS

The case of D1 Oils in Swaziland demonstrates that many of the industry's claims for the potential of jatropha as a sustainable biofuels crop are, at best, unproven.

No strategic environmental impact assessment has been carried out on the potential impacts of jatropha in Swaziland. Some farmers in Swaziland who have already planted jatropha report problems with pests and that the plants need to be watered frequently. Farmers are already raising concerns about yield.

The oil yield from jatropha when it is grown on marginal or waste land with no water, fertiliser or pesticide input is, at best, uncertain. The high yields needed to make jatropha commercially viable as a biofuel crop are far more likely to be obtained when it is planted on fertile irrigated land. This could mean that widespread jatropha plantations for biodiesel compete with food production for fertile agricultural land.

While jatropha is not a food crop, the use of the plant for biofuels still raises issues about competition with land use and food production. The experience from Swaziland, backed up by various scientific studies, implies that policy makers in the EU and UK need to treat jatropha with the same degree of rigour as other biofuel crops.



## Jatropha : wonder crop?

The rush towards biofuels is fraught with social and environmental concerns and unproven climate benefits.

Jatropha (*Jatropha curcas*) has been promoted by UK biofuel company D1 Oils as a wonder crop because of the plant's ability to grow on marginal and semi-arid land.

This report for media and policy makers highlights the concerns over jatropha's impact, questions some of the claims being made for biofuel from the plant, and makes recommendations to European and UK Government.

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Friends of the Earth England, Wales and Northern Ireland  
26-28 Underwood Street  
London N1 7JQ  
[www.foe.co.uk](http://www.foe.co.uk)  
Tel: 020 7490 1555  
Fax: 020 7490 0881

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Yonge Nawe (siSwati for "You too must conserve") is a public interest NGO working to prevent and reduce the impacts of inappropriate development on the environment and people. We believe everyone should enjoy a good quality of life. We campaign on the most important issues impacting socio-economically disadvantaged communities within Swaziland – those communities typically unable to participate in debates about development that will dramatically affect their lives. For further information visit [www.yongenawe.com](http://www.yongenawe.com)



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