

Agrofuels in South Africa

projects, players and poverty



© The African Centre for Biosafety 2008

ISBN: 978-0-620-4284-8

www.biosafetyafrica.net

PO Box 29170, Melville 2109 South Africa
Tel and Fax: +27 (0)11 482 8915 (from 1 January 2009: +27 (0)11 726 7829)

The African Centre for Biosafety (ACB) is a non-profit organisation, based in Johannesburg, South Africa. It provides authoritative, credible, relevant and current information, research and policy analysis on genetic engineering, biosafety, biopiracy, agrofuels and the Green Revolution push in Africa.

Design and layout: Adam Rumball, Sharkbuoys Designs

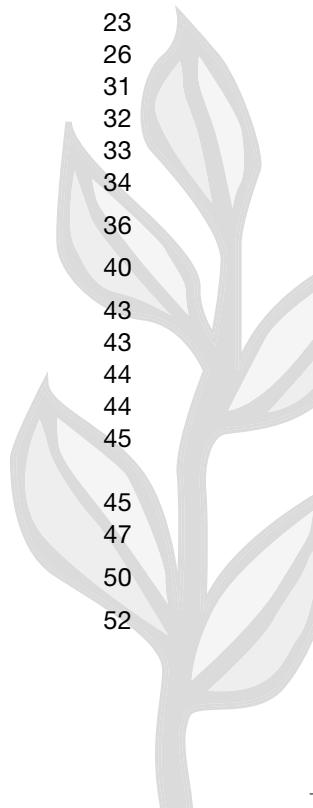
Printed by: PressPrint

Acknowledgements

This publication has been made possible as a result of the generous support of the Evangelischer Entwicklungsdienst (EED) and Isvara Foundation.

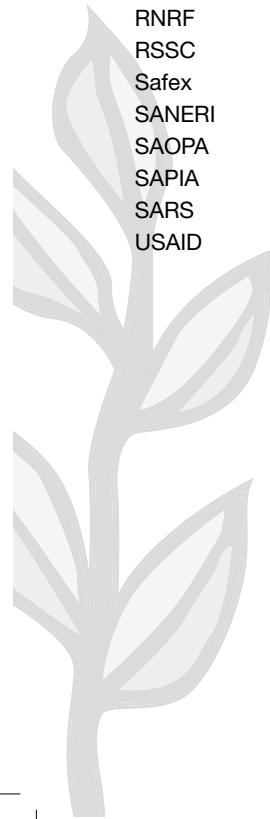
Contents

Executive summary	6
Introduction	10
Policy issues	11
Biofuels Task Team report	11
Draft Biofuels Industrial Strategy	12
Reaction to draft Strategy	13
Approved Biofuels Industrial Strategy	15
Regulatory issues	17
Licensing	17
Administering tax incentives	18
Blending and manufacturing	19
Government and parastatal involvement in agrofuels in South Africa	21
Agofuel developments in South Africa	23
Eastern Cape	26
KwaZulu-Natal	31
Mpumalanga	32
Limpopo	33
North West	34
Massively industrialising the Eastern Cape	36
The sugar industry waiting in the wings	40
Discussion and analysis: implications and key concerns	43
Cooling down the commercial agriculture sector	43
Agofuels: the impetus to extend agribusiness markets	44
The myth of ‘under-utilised’ land	44
The mechanism for land grabs	45
Impacts of expanding the use of GM crops in the agofuels programme	45
Agofuel impacts on food security and supply	47
Conclusion	50
References	52



Acronyms

AGRA	Alliance for a New Green Revolution in Africa
ARC	Agricultural Research Council
AsgiSA	Accelerated and Shared Growth Initiative for South Africa
CEF	Central Energy Fund
CEO	Chief Executive Officer
COSATU	Congress of South African Trade Unions
DBSA	Development Bank of South Africa
DME	Department of Minerals and Energy
EDC	Energy Development Corporation
EIA	Environment Impact Assessment
GM	genetically modified
IDC	Industrial Development Corporation
IDZ	Independent Development Zone
KZN	KwaZulu-Natal
MEC	Member of Executive Council (Provincial)
MMI	Mapfura-Makhura Incubator
RNRF	Rainbow Nation Renewable Fuels
RSSC	Royal Swaziland Sugar Corporation
Safex	South African Futures Exchange
SANERI	South African National Energy Research Institute
SAOPA	South African Oil Processors Association
SAPIA	South African Petroleum Industry Association
SARS	South African Revenue Service
USAID	United States Agency for International Development



we can't call this a 'bio-fuels program'. we certainly can't call it a 'bio-diesel program'. such phrases use the prefix 'bio' to subtly imply that the energy in question comes from 'life' in general. this is illegitimate and manipulative. we need to find a term in every language that describes the situation more accurately, a term like agro-fuel. this term refers specifically to energy created from plant products grown through agriculture.

MST, Via Campesina¹

Use of terms: agrofuels and biofuels

The term "agrofuels" has been coined by social movements in Latin America to describe the use of food and oil crops produced in large-scale plantation style systems. These crops are processed and blended with petroleum and used as an energy source, primarily for motor vehicles. Biofuels on the other hand, describe the traditional use of wood, dung and other biological materials for fuel.

Bioethanol is produced predominantly from sugar cane and maize (corn) and currently to a far lesser degree, from wheat, sugar beet and cassava. Bioethanol is primarily used as a motor fuel and fuel additive. Internationally biodiesel is mainly extracted from rapeseed (also known as canola) but also from oil palm, soybean and *Jatropha*.²

Although the South African government has published a 'Biofuels industrial strategy', this strategy is more accurately an 'agrofuels' strategy because it promotes industrial production of crop plants for energy and excludes other biomass-based fuels such as biogas.

We use the term 'biofuels' in this paper when we are quoting or referencing sources that use this term, such as government policy documents.

executive summary



The South African government has readily embraced the establishment of an agrofuels industry, citing job creation, the need for clean and renewable energy and the creation of markets for small-holder farmers, as key motivators. Nevertheless, it is our view that the logic of the Biofuels Strategy to introduce large-scale, mono-crop agriculture into the former homelands especially,ⁱ and other areas of the country, will perpetuate the model of production and consumption of an industrial civilisation that has led to inequality in the world, wars, poverty, and environmental destruction. The industrialisation of agriculture by its very nature, results in displacing rural peoples and traditional farmers from the countryside as it embodies an agricultural system without farmers. This model has far-reaching implications for the whole of society. It implies dispossession of communities of their land and the plunder of their territories, concentration and privatisation of land and water sources, erosion of biodiversity, destruction of natural ecosystems, and the violence and militarisation required to force control over natural resources. Agrofuel production in South Africa has been identified as a key growth sector in the Accelerated and Shared Growth Initiative for South Africa (AsgiSA),³ a national programme aimed at increasing economic growth. During October 2006, a feasibility report promoting the establishment of an agrofuels industry in South Africa was published.⁴ Subsequently in December 2007, a final Biofuels Industrial Strategy was finalised.⁵

The aim of the Strategy is to establish the enabling policy, legislative and fiscal framework for the production of up to 400 million litres of agrofuels, constituting 2% of the total national consumption. Sugar cane, sugar beet, sunflower, canola and soya are to be feedstocks. A blending ratio of 8% bioethanol and 2% biodiesel is envisaged. Maize and *Jatropha* have specifically been excluded on food security and environmental grounds respectively.

ⁱ The apartheid government set aside ten homeland areas for the "separate development", according to ethnic background, of South Africa's black people. Stripped of their citizenship, black South Africans were coerced to live in these areas through forced removals and the pass book system. Generally these 'homeland' areas were seen to have little economic value or potential.

Land labelled as ‘under-utilised’ – mainly communal land in the former homelands will be brought into mainstream agricultural production. In this regard, the Strategy links the granting of licenses and tax incentives to the use of feedstock grown by previously disadvantaged farmers on ‘under-utilised’ agricultural land. Indeed, in September 2008, the Coega-based biodiesel company, Rainbow Nation Renewable Fuels, became the first company in South Africa to receive an operating license.⁶

Incentives for agrofuel production are limited to rebates on the fuel levy and entail a 50% rebate for biodiesel provided that no less than 1.2 million litres are produced per year. A 100% rebate will also be provided for bioethanol that forms part of a fuel blend.⁷ The South African Revenue Service (SARS) is currently working on legislative mechanisms to implement these exemptions.⁸

The subsidy question remains unresolved ostensibly because of the lack of clarity regarding ethanol blending practicalities and the high price of vegetable oil, which is currently twice the price of pump diesel. Nevertheless, the South African Petroleum Industry Association (SAPIA), a pivotal agrofuels player, continues to lobby government to provide government subsidies.⁹

The commercial grain and sugar sectors are also unhappy about the lack of government subsidies but they are quietly conducting feasibility studies and waiting in the wings until the fiscal climate becomes clearer and more favourable to them. As soon as this happens, they will be ready to massively roll out agrofuels production in the country. Sugar giant, Tongaat Hulett has for instance, already earmarked the Amatikulu mill on the north coast of KwaZulu-Natal (KZN) as “the most likely opportunity to produce ethanol from the sugar and molasses not required for sale in local markets”.¹⁰

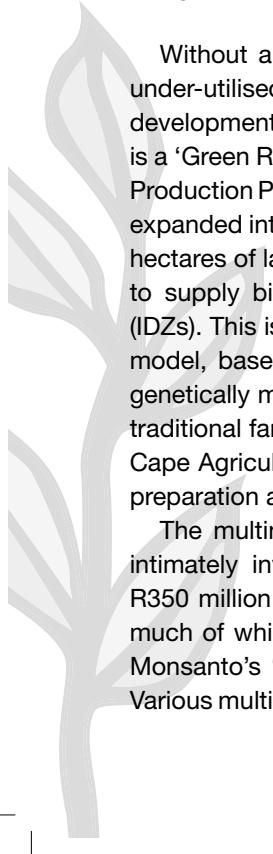
There are numerous agrofuels projects currently going ahead, facilitated and funded by parastatal agencies and programmes specifically funded by government to kick start an agrofuels industry in the country. The Central Energy Fund (CEF), Industrial Development Corporation (IDC), AsgiSA and various provincial departments form an interlinked and complex network of government agencies pushing the agrofuels agenda forward. These initiatives almost without exception include private capital. Many are also linked to huge manufacturing infrastructure development projects in the Independent Development Zones of Mafikeng, East London and Coega.

The projects include the following:

1. **Hoedspruit** in Mpumalanga – a CEF/IDC partnership to grow sugar cane and sweet sorghum for ethanol

8 BIOSAFETY, BIOPIRACY AND BIOPOLITICS SERIES

2. **Cradock** in the Eastern Cape – a CEF/ IDC/Sugar Beet SA partnership to grow sugar beet for ethanol
3. **Makhathini** in KwaZulu-Natal – a CEF/IDC partnership to grow sugar cane and cassava for ethanol
4. **Bizana and Paddock/ Izingolweni** in Pondoland (stretching across the Eastern Cape and KZN provincial borders) – the IDC in partnership with J&J Bioenergy, to grow sugarcane and sweet sorghum for ethanol
5. **East London** IDZ in the Eastern Cape – biodiesel plant to process canola produced through the Eastern Cape Intercropping Programme for export to Europe
6. **Coega** IDZ in the Eastern Cape – biodiesel plant developed by Rainbow Nation Renewable Fuels to process soya produced through the Eastern Cape Intercropping Programme and elsewhere
7. Mapfura-Makhura Incubator (MMI) near **Marble Hall** in Limpopo – a project developed by the Agricultural Research Council (ARC) and funded by the Department of Science and Technology and the Limpopo Department of Agriculture to grow sunflower and soya for biodiesel.



Without a doubt, the Eastern Cape Province – where most of the so-called under-utilised and communal land is situated – is a hot-spot for agrofuels development. At the heart of the Eastern Cape provincial agrofuels development, is a ‘Green Revolution’ programme, also euphemistically titled, the ‘Massive Food Production Programme’. The Massive Food Production Programme has since been expanded into the ‘Integrated cropping programme’, aimed at converting 500 000 hectares of land over a period of five years to grow soya and canola (rape seed)¹¹ to supply biodiesel plants in the province’s Independent Development Zones (IDZs). This is an aggressive project that seeks to foist the industrial agribusiness model, based on chemical inputs, monocultures, corporate owned hybrid and genetically modified (GM) seeds, onto some of the last remaining communal and traditional farming systems in the country. Already in 2007, the provincial Eastern Cape Agriculture department set aside R9.5 million to begin the process of land preparation and conversion.¹²

The multinational agrochemical and biotech company, Monsanto, has been intimately involved in this programme. The Eastern Cape government spent R350 million in the first five years of the Massive Food Production Programme, much of which was used as subsidies to enable emerging farmers to purchase Monsanto’s ‘combi-packs’ of hybrid and GM seeds and associated chemicals. Various multinational companies linked to the distribution of Monsanto’s products,

provided training to the provincial Department of Agriculture extension officers, aimed primarily at introducing Roundup Ready seeds as well as insect-resistant maize seeds (YieldGard seeds) and the use of herbicide to farmers.¹³

As in the case of the Green Revolution push, the companies that sell seeds, fertilisers, pesticides, herbicides, farming machinery, irrigation equipment and the final fuel products will be the main beneficiaries of the agrofuels drive. Emerging farmers that are being targeted by the agrofuels schemes will not be able to afford to pay for the expensive inputs that characterise industrial agriculture. Moreover, the industrial model of agriculture introduced through the agrofuels initiatives will displace traditional livelihood strategies, including the diversity of farmed and wild plants for food security, medicines and livestock grazing. These have been integral to traditional farming systems and culture.

introduction



This study has been compiled principally from desktop research. Where possible, telephonic interviews have been conducted with key people involved in agrofuels projects. Thus, this paper provides only an overview of South Africa's emerging agrofuels industry, beginning with an examination of the current policy context facilitating these developments. The paper then presents pertinent information concerning the industrial scale agrofuels projects in the country, including identifying the public and private corporations involved.

The final part of the paper discusses some of the implications and key concerns that arise from these developments.

It should be noted that the study is only a starting point and needs to be supplemented by the experiences of communities at the receiving end of the agrofuels development projects.

We trust that this booklet will contribute to the generation of public awareness and debate. This paper should also be read in conjunction with ACB's Briefing Paper, 'South Africa's Biofuels Strategy: greenwashing agribusiness interests', which discusses the key social and environmental concerns about agrofuels development in South Africa.

policy issues



Biofuels Task Team report

The global agrofuels boom is an inextricable part of the current inequitable, unjust and unsustainable mode of production and consumption that characterise the modern dominant political, social and economic order. The South African government needed little persuasion to embrace agrofuels. Indeed, in December 2005, it established an Interdepartmental Biofuels Task Team to develop a draft 'Biofuels Industrial Strategy' for South Africa.

The Task Team produced a detailed feasibility report in favour of an agrofuels industry in South Africa in October 2006. The significant recommendations of the feasibility report can be summed up as follows:¹⁴

- That a biofuels target of 3.4 % of liquid fuels was attainable by 2013;
- A 2% blend of biodiesel (B2) derived from soya would be commercially viable without subsidies at an oil price of \$65 per bbl (barrel).
- A 10% blend of ethanol (E10) from the maize and sugar surplus would be commercially viable without subsidies at an oil price of \$65 per bbl.
- A 4.5% biofuel contribution to liquid fuels use would do little to assist South Africa with its balance of payments or to achieve energy security.ⁱⁱ
- South Africa's national biofuel programme should support a regional programme aimed at harmonising regional fuel specifications, taking into account the abundance available in the region of arable land and other vital resources such as water, to support a biofuels industry.

ii Liquid fuels are a heavy fiscal burden – although comprising only 30% of South African total energy use, liquid fuels contribute approximately 70% to South Africa's total energy expenditure, due to the high cost of crude-oil imports.

Draft Biofuels Industrial Strategy

One month after the release of the feasibility study, and with there being no opportunity for public discussion on the findings of the Task Team, the national Department of Minerals and Energy, with indecent haste, released a draft Biofuels Industrial Strategy for public comment. The draft Strategy proposed that by 2013, at least 4.5 % of South Africa's transportation needs should be supplied by agrofuels.

Government's main justification for supporting agrofuels development is job creation, and the need for diverse and less environmentally damaging energy sources. Identifying agrofuels as a source of clean and renewable energy, the draft proposed that with a 4.5% agrofuels uptake, 75% of South Africa's renewable energy target of 10 000 Gwh by 2013 would be taken care of.¹⁵ Agrofuels were identified as a key growth sector by the Accelerated and Shared Growth Initiative for South Africa (AsgiSA). Launched in February 2006, AsgiSA is a national programme aimed at increasing economic growth through labour intensive economic activities ostensibly to combat spiralling poverty and inequality.¹⁶

The draft strategy emphasised the use of surplus agricultural production in maize and sugarcane and so called 'under-utilised' land for the purposes of agrofuels production. It also welcomed South Africa's involvement in the development and utilisation of second generation agrofuels technologies. Importantly the draft proposed a mandatory blending of agrofuels from locally grown sources, promising a ready market for the agrofuels industry.¹⁷

Second generation biofuels

'First generation' agrofuels are ethanol and biodiesel produced using currently available processing methods from agricultural and oil crops, most of which are also grown for food.

'Second generation' agrofuels are manufactured using more complex processing from inedible plant material where the useful sugars are trapped within tough lignin and cellulose. For example, wood chips, fruit skins or the stalks of grain crops. It is envisioned that liquid fuels would be produced by: 1) converting cellulosic material to ethanol using enzyme-enhanced fermentation, and 2) using gasification and 'Fischer-Tropsch' gas-to-liquids technology to convert woody biomass to synthetic diesel. These technologies are currently in development and not yet commercially available.¹⁸

South African Research and Development in second generation agrofuels

The University of Stellenbosch, under the leadership of Professor Emile Van Zyl from the Department of Microbiology, are positioning themselves as a key research institution with expertise in so-called “second generation” technologies. Professor Van Zyl has been appointed the Senior Chair of Energy Research (CoER) by the South African National Energy Research Institute (SANERI) and is currently heading a large biofuels research programme to develop advanced second generation agrofuels technologies.¹⁹ Prof. van Zyl is an expert in the microbiology and biochemistry of plant degrading enzymes, focusing on one-step fermentation of acid-treated cellulose to bioethanol using genetically engineered yeast strains.²⁰

Reaction to draft Strategy

Encouraged by the seemingly positive agrofuels policy developments, several agribusiness interests pressed ahead with grandiose agrofuel investment plans. The most notable is a consortium of commercial maize farmers, who together with the carbon credits company Sterling Waterford and Lereko Holdings, collectively invested over R430 million in a maize to ethanol plant that was partially built in Bothaville in the Free State province.²¹ (See box on page 14).

In contrast, the draft Strategy drew intense criticism from civil society. Non profit organisations from the land, agriculture and energy sectors expressed outrage at the lack of public consultation. Agrofuels were also roundly condemned for their potential to compete with food crops and drive up food prices.²² Rural communities expressed grave concern that their land, labelled as ‘under-utilised’, was being targeted for agrofuels production in a ‘land grabbing’ fashion.²³ Organised labour under the auspices of the Congress of South African Trade Unions (COSATU), submitted a caustic written objection to the Strategy, which it summed up as follows: “The strategy hugely and unashamedly favours the interests of industry participants and investors. While some attention was given to job creation, the assumptions are less than credible and highly optimistic. More worrisome is the related resource implications of contesting for land, water and utilising food products for exclusive industrial use.”²⁴

As the South African government deliberated on its next move, food riots erupted around the world as a result of dramatic increases in the price of food. The first of these – the tortilla riots – took place in Mexico in January 2007, when prices for imported maize skyrocketed due to a shortage in maize supply created by the USA's demand for maize for domestic ethanol production.²⁵

In August 2007, Reserve Bank governor Tito Mboweni made use of an address to the National Assembly's Finance Portfolio Committee to caution against the use of maize for ethanol production, warning that this could push up food prices and distort the maize market.²⁶

The maize heartland's fuelish gamble – Ethanol Africa at Bothaville in the Free State

Ethanol Africa's maize to ethanol plant in the heart of the maize belt in Bothaville was the first large commercial agrofuel project initiated in South Africa, and the beginning of ambitious plans for another seven plants in the Free State, Mpumalanga and North West.

Maize farmers represented by Grain Alcohol Investments bought into the project early on through silo certificates (effectively pledges to supply maize which then can be sold in the market) to the value of R24 million. The cost of the Bothaville plant was projected to be R1 billion, with construction beginning in mid 2006 with the date of completion set at mid 2008.²⁷ In August 2006, the Department of Trade and Industry approved the project as a 'Strategic Industrial Project'²⁸, in order to allow for tax relief on the cost of industrial assets.²⁹

During February 2006, the carbon credits company, Sterling Waterford became a member of Ethanol Africa.³⁰ In March 2007, they invested R408 million in the project, thus allowing Ethanol Africa to access loans of an equivalent amount.³¹ Sterling Waterford holds the majority share in the company at 35% with black economic empowerment company Lerako Holdings at 25%, Ecofields (5 founding members) at 22% and Grain Alcohol Investments representing maize farmers at 18%.³²

The company planned to process 1 150 tons of maize a day supplied through contracts with farmers within 80km of Bothaville. In order to secure buy in from commercial maize farmers, the company promised cost savings of R135 a ton usually paid by maize farmers to silo operators for drying to reduce moisture content.³³ The plant was expected to produce 473 000 litres

of ethanol and 63 000 litres of biodiesel a day.³⁴

In February 2007 construction on the plant was brought to a halt, while the German Engineering company Uhde revised the detailed design and execution of the project. Construction hadn't resumed by December 2007 when government's announced that maize was excluded as a feedstock for ethanol and this served to abruptly stop any further construction plans. According to a company employee, all plans are on hold and the company is waiting it out until government reviews the biofuels strategy in 2013.³⁵ This was confirmed by Gregor Paterson-Jones, CEO of Sterling Waterford Securities, who is quoted in the media as saying, "As for development of ethanol plants, we have adopted a wait and see attitude. All plans have been put on hold."³⁶

Approved Biofuels Industrial Strategy

The final Biofuels Industrial Strategy approved by Cabinet was published in December 2007. It differs markedly from the draft Strategy. In a move that stunned agribusiness, the final Strategy specifically prohibits the use of maize as an agrofuels feedstock. Reacting to this prohibition, inorganic fertiliser giant, Omnia, pleaded for an urgent re-examination of the Strategy³⁷ and GRAIN SA, representing the grain sector, continues to lobby the government to re-open the maize question, even going so far as hosting its own multi-stakeholder forum in May 2008 in order to garner support for its cause.³⁸

The main goal of the final strategy is to bring land labelled as 'under-utilised', mainly in former 'homeland' areas, into mainstream agricultural production. The current strategy will be reviewed in 2013. Until then, the promotion and development of an agrofuels industry as outlined in the Strategy is to be regarded as a 'pilot phase'.

Key provisions of the South African Biofuels Industrial Strategy³⁹

- Crops: sugar cane, sugar beet, sunflower, canola and soya. Maize and *Jatropha* are excluded.
- Up to 400 million litres of agrofuels if national liquid fuel supply per annum = 2% of the total consumption.
- Total national average blending ratios of 8% ethanol in petrol and 2% biodiesel in diesel.ⁱⁱⁱ
- NO mandatory blending required.
- 50% fuel levy exemption for biodiesel.
- 100% fuel levy exemption for ethanol (to ensure fairness in gel fuel market – illuminating paraffin also has 100% exemption).
- A fixed margin price of R4.20 per litre for ethanol and R4.88/litre for biodiesel to guarantee producers a return on investment.
- Biodiesel plants producing under 1.2 million litres per annum are exempt from fuel tax.
- Biofuel manufacturing plants must be licensed to operate for products to qualify for tax exemptions – licenses will only be issued to projects located and procuring feedstock from former homeland or previously disadvantaged farmers.

ⁱⁱⁱ These are average percentages of total national supply, but in local areas blends of up to 10% ethanol (E10) and 5% biodiesel (B5) can be supplied in accordance with South African National Standards (SANS) developed by the SA Bureau of Standards.

regulatory issues



The Biofuels Industrial Strategy outlines the policy environment for the development of the agrofuels industry and sets targets for the uptake of agrofuels in the national fuel supply. However, the details of how this will be implemented require further legislative and regulatory elaboration under the Department of Minerals and Energy's (DME) leadership. Thus far the 'Regulations regarding petroleum manufacturing licenses'⁴⁰ were gazetted to include biofuels and 'Criteria for licenses to manufacture biofuels'⁴¹ have been issued by the DME. Agrofuels investors and the petroleum industry have indicated that several regulatory issues still need clarity. These include operational issues in relation to blending and transportation (especially of ethanol), fuel specifications for biofuel blends, as well as mechanisms to administer the fuel levy rebate. Steve Collins of J&J Bioenergy sums it up, "Everyone is waiting on the regulatory framework. No one will develop or proceed with EIAs etc., until they are confident they have an off-taker to buy the product. It is too expensive to export at the moment."⁴²

Licensing

All biofuel manufacturers, including pilot projects, must apply for manufacturing licenses. The 'Criteria for licenses to manufacture biofuels' stipulate that licenses will only be granted to commercial producers if the manufacturer uses feedstock grown by emerging farmers in under-utilised areas, and this may not include maize or *Jatropha*. Where there is a shortage during the inception of projects, feedstock can be supplemented from commercial farmers or imports if detailed phase-in plans for replacing this from local emerging farmers are provided. License holders are also required to apply in writing to allow for imports during periods of adverse

Off-take agreements

An off-take agreement is when a buyer contracts to buy the farmer's produce at predetermined prices and conditions, typically over a number of years.

local agricultural production. License applicants must provide proof of off-take agreements for the fuel and other by-products, as well as agreements for blending facilities. Another important stipulation in the criteria is that feedstock must be grown without irrigation unless exceptional circumstances are motivated for, in which event water that is already used for irrigation purposes, can't be re-allocated for agrofuel production. All other provisions pertaining to the manufacture of petroleum products contained in the Petroleum Products Act of 2003 also apply to biofuels manufacturers.⁴³ Promulgated in terms of this Act, the 'Regulations regarding petroleum manufacturing licenses' require that fuel manufacturers advertise their intention to apply for a license to manufacture fuel by way of an announcement in two local and two national newspapers.⁴⁴ There is no publicly accessible database of those manufacturers that have applied for licenses or who have been granted licenses to produce agrofuels.⁴⁵ To date, we are aware of only one such license being granted, and this is to the Coega-based biodiesel company, Rainbow Nation Renewable Fuels, because it publically announced that it is the first company to receive an operating license. This was awarded by the DME in September 2008.⁴⁶

Administering tax incentives

The main government support to the agrofuels industry is being provided for in the form of tax incentives, principally a rebate on the fuel levy as discussed earlier.

Currently, the South African Revenue Service (SARS) collects the following fuel levies:

- The largest portion (currently R1.11 per litre of diesel and R1.27 per litre of petrol) is a general fuel levy that is used to fund general government expenditure.
- The customs and excise levy (4 cents per litre).
- Road Accident Fund's contribution (currently 46.5 cents per litre), which compensates road accident victims.⁴⁷

A fuel levy exemption for biodiesel manufacturers has been in place for some time. The national treasury first approved a fuel levy exemption of 30% for biodiesel in 2002 and this has now been increased to 50% in the current Biofuel Industrial Strategy. SARS has also allowed a 100% exemption for manufacturers that produce under 300 000 litres per year. This has been increased to 1.2 million litres by the Strategy⁴⁸, and requires that all biodiesel manufacturers register with

SARS to control this.

In contrast, the practical implications of supporting ethanol producers are still being worked out by the National Treasury, SARS and a range of consultants. The National Treasury has made a policy decision that bioethanol will be free of duty if used as a petrol blend. However, SARS are currently grappling with the legislative mechanisms to control how this happens practically to prevent manufacturers from claiming higher blends than they are in fact using.⁴⁹

Blending and manufacturing

During 2008, South Africans consumed an average of 907 million litres of petrol and 815 million litres of diesel per month.⁵⁰ Consumption of vehicle fuel has grown by just over 10.5% in the last 2 years (see table below). Thus the biofuels strategy's target of incorporating 400 million litres of biofuel per annum will make a negligible contribution towards energy security and self-sufficiency in South Africa or reducing its balance of payments. About 64% of South Africa's liquid fuels are refined from imported crude oil, which is South Africa's biggest imported commodity, while the rest are synthetic fuels produced from coal (by Sasol) and gas.⁵¹

South African consumption of vehicle fuels in millions of litres per annum⁵²

	2005	2006	2007
Petrol	11165	11279	11558
Diesel	8115	8708	9757
Total	19280	19987	21315

Although the petroleum industry has expressed support for the inclusion of agrofuels in the national fuel supply, the operational practicalities of transporting and blending bioethanol in particular still poses many challenges. The South African Petroleum Industry Association (SAPIA) voiced its concerns at a parliamentary briefing on the 19 March 2008⁵³, as follows: “*the strategy failed to address certain key issues of the practical and economic implications of integrating biofuels into the fuels supply chain.*”

SAPIA's specific concerns about ethanol include⁵⁴:

- Adding small quantities of ethanol to petrol, changes its vapour pressure making it more volatile. This can affect engine performance in high temperatures and altitudes. New fire fighting equipment would be needed at distribution points.
- The presence of water in the fuel supply system would cause the ethanol to separate out of the fuel and dissolve in the water, causing the octane levels of the petrol to drop. Tanks and piping need to be upgraded to prevent water from getting into the system. Normally water from condensation, for example, would collect at the bottom of a tank where it can be removed.
- If ethanol is separated out, people would be able to siphon this off for drinking purposes. The ethanol would need to be denatured to make it unpalatable.
- Linings and seals of storage tanks, transport tankers and pipe networks need to be checked for compatibility with ethanol.
- Ethanol consumption in an engine is approximately 34% higher than petrol,⁵⁵ so at a 10 per cent blending level, fuel consumption increases by about 3.5 per cent for the same distance. This might have implications for the amount of storage tank space required at distribution centres in the longer term.
- Clarity is needed on blending ratios. At a 2% ethanol blend the fuel behaves the same as fuel without ethanol, but at a 10% blend the properties of the fuel are changed.

SAPIA is less concerned with biodiesel as this can be blended with petroleum diesel in any proportion without necessitating any processing changes at the refinery. SAPIA's main concern is the quality of biodiesel that will be received, especially if a number of small-scale producers are involved.⁵⁶ Although all fuels must comply with standards set by the South African Standards Authority, based on automotive industry requirements for engine performance and emissions control, it is costly to test for all the parameters to ensure biodiesel quality.⁵⁷ Biodiesel producers must test their product to show proof that it meets South African National Standard (SANS) 1935, which is the standard that applies to biodiesel. According to some experts, the benefit of a biodiesel blend is that even when small percentages are added, biodiesel assists with the lubricity of the fuel. When the sulphur content of diesel is lowered for cleaner emissions, adding biodiesel avoids the need to add other lubricating chemicals.⁵⁸

SAPIA has noted that the development of the industry in the rest of the world has depended on large government subsidies, and estimates that including biofuels in the South African fuel mix would add 10 to 15 cents per litre to the price of fuel. It is currently not clear who would foot this bill in South Africa.⁵⁹

government and parastatal involvement in agrofuels in south africa



The Biofuels Strategy specifically tasks state owned entities with the responsibility of facilitating the development of an agrofuels industry by *inter alia*, investing in infrastructure and agrofuels development projects, facilitating public private partnerships and black economic empowerment, and providing a market for them as large scale consumers.⁶⁰

To date, the Industrial Development Corporation (IDC) and the Central Energy Fund (CEF) have played key roles in fostering the emerging agrofuels industry. In April 2006 the IDC and a division of the CEF, the Energy Development Corporation (EDC), signed a collaboration agreement to develop bioethanol projects in South Africa.⁶¹

The IDC is a development finance institution solely owned by government, and governed by a Board of Directors appointed by the Department of Trade & Industry. It was originally established by the apartheid government in 1940 as a vehicle for government investment in industrial processing and beneficiation at a time when South Africa's economy was dominated by the extraction and export of raw materials. The pressure to establish local manufacturing became greater through the apartheid era as South Africa became increasingly isolated and sought import replacements for greater self sufficiency. The IDC thus played a key role in financing both private investors and state corporations to establish the industries that kept the South African economy and thus the apartheid government afloat, including the textiles, pulp and paper, chemical, fertiliser, mineral processing and arms industries. The IDC helped to establish many state corporations, including the Phosphate Development Corporation (Foskor); the South African Coal, Oil, and Gas Corporation (SASOL); and the Southern Oil Exploration Corporation (Soekor).⁶² In the post apartheid era the IDC has a mandate to *inter alia* invest in the expansion of new large-scale industries, as well as small and medium enterprises to further government's job creation initiatives and address the economic imbalances of the past. It also has a mandate to promote investment in the industrial development zones and secure co-investment from foreign partners in large investment projects.

It is intended that the IDC play a catalytic role, providing risk capital in partnership with the private sector to support developments that are not being addressed by the market.⁶³ However, COSATU has recently criticised the institution for not fulfilling its developmental role, and instead providing low interest funding to BEE^{iv} cronies.⁶⁴

Similarly the CEF is a private company, solely owned by government and controlled by the Minister of Minerals and Energy. The purpose of the CEF is to research, develop, finance and distribute energy solutions for South and southern Africa as well as managing the operation and development of the oil and gas assets and operations of the South African government.⁶⁵ The EDC is a division of CEF, established in 2004 specifically to catalyse investment and development in renewable energies in South Africa.⁶⁶

The projects in which the CEF and/or the IDC are involved include:

- Hoedspruit in Mpumalanga growing sugar cane and sweet sorghum
- Cradock in the Eastern Cape growing sugar beet
- Makhathini in KwaZulu-Natal growing sugar cane and cassava
- The IDC is also involved in projects in Pondoland (stretching across the Eastern Cape and KZN provincial borders) together with J&J Bioenergy, which is driving these.
- The CEF were involved in a joint project with Sasol and Siyanda Biodiesel to produce biodiesel from soya, but this project appears to be on hold due to the high price of edible oil.⁶⁷

AsgISA is also a major driver for agrofuels, as discussed earlier. Development projects in the Umzimvubu Catchment in the Eastern Cape, and agrofuels initiatives that cover the Northern Cape, Free State, KwaZulu-Natal, Eastern Cape and Mpumalanga are ‘special projects’ that have been selected for infrastructure development and support under AsgiSA.⁶⁸

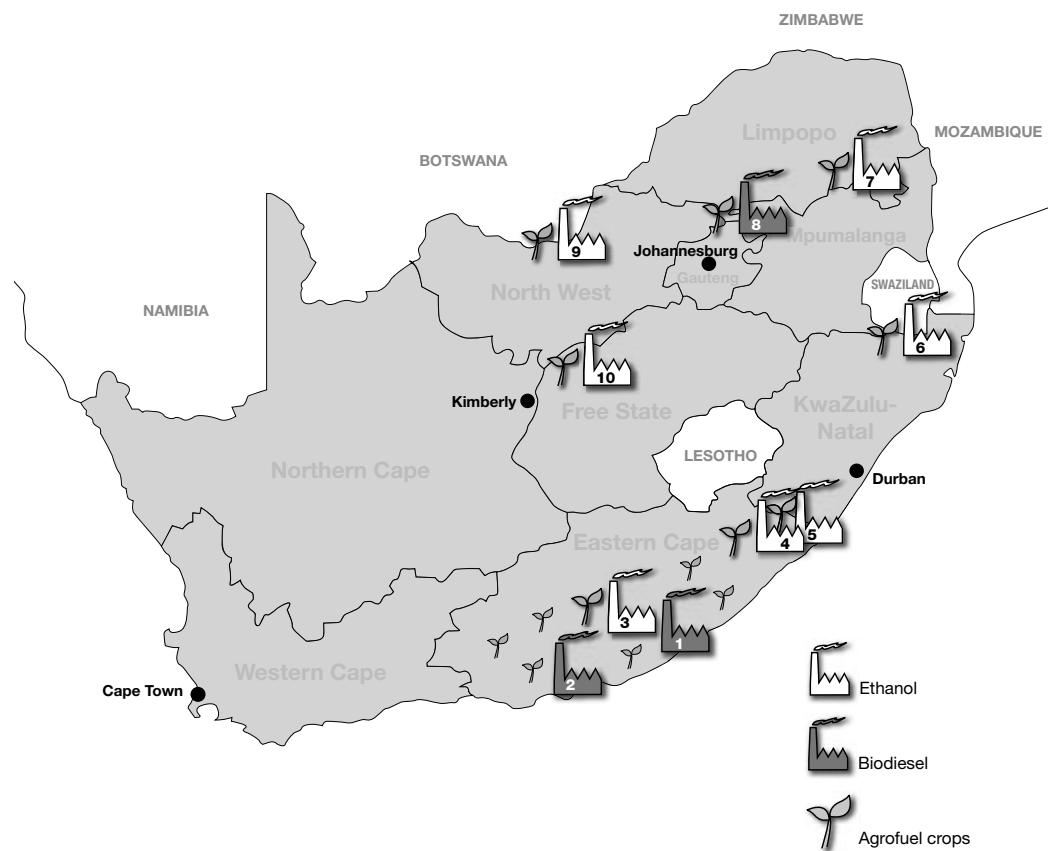
The CEF, IDC, AsgiSA and various provincial departments of agriculture and economic development thus form an interlinked and complex network of government agencies pushing the agrofuels agenda forward in collaboration with various private investors. Projects are also linked to the massive manufacturing infrastructure development projects in the Independent Development Zones of Mafikeng, East London and Coega. This effort is most organised in the Eastern Cape, which has become a hot-spot for agrofuels developments.

^{iv} Black Economic Empowerment (BEE) is the process by which previously disadvantaged South Africans are being empowered through the transfer of skills and the ownership, management and financial control of companies.

agrofuel developments in
south africa



Agrofuel project developments in South Africa



Key

1. East London IDZ

Biodiesel from canola

Partners: Eastern Cape Dept Agriculture, AsgiSA Eastern Cape

2. Coega IDZ

Rainbow Nation Renewable Fuels

Biodiesel from soya

Partners: Eastern Cape Dept Agriculture, AsgiSA Eastern Cape

3. Cradock

Ethanol from sugar beet

Partners: CEF, IDC, Sugar Beet SA

4. Bizana

Ethanol from sugar cane, possibly sweet sorghum

Partners: IDC, J&J Bioenergy

5. Paddock/ Izingolweni

Ethanol from sugar cane

Partners: IDC, J&J Bioenergy

6. Makhathini

Ethanol from sugar cane, possibly cassava

Partners: CEF, IDC

7. Hoedspruit

Ethanol using sugar cane, possibly sweet sorghum

Partners: CEF, IDC

8. Marble Hall

Mapfura-Makhura Incubator (MMI)

Biodiesel from sunflower, soya

Partners: Agricultural Research Council (ARC), Department of Science and Technology

Department of Agriculture

9. Mafikeng

Mafikeng Biodiesel Company

Ethanol from oil bearing trees (originally including *Jatropha curcus*, *Moringa*, *Ximenia caffra*,
Pappea capensis)

Partners: University of Pretoria, Invest North West, Barolong Bo-Ratschidi Development
Company, D1 Oils

10. Bothaville

Ethanol from maize

Partners: Ethanol Africa, Grain Alcohol Investments, Sterling Waterford, Lerako Holdings,
Ecofields

Eastern Cape

East London IDZ

Biodiesel from canola

Planned plant production capacity per annum:

- 500 000 tons of canola processed
- 200 000 tons of biodiesel produced
- 325 000 tons of oilcake for animal feed produced glycerine

Expected direct jobs:

- 200 people at the processing facility
- 60 people at storage silos on site and in production areas

Capital investment (estimated):

- R130 million in storage silos
- R4.4 billion in total including farming

Expected to be in production beginning 2010

Source: M. Ntombana. Sector Specialist: Automotive & Biofuels at ELIDZ⁶⁹

The Industrial Development Zone (IDZ) is planning a biodiesel plant to process the canola that Eastern Cape farmers will produce under the ‘Integrated cropping programme.’ The IDZ confirmed that it is close to finalising a deal with an undisclosed German investor, which provided some of the impetus for establishing the Eastern Cape biofuels programme. The IDZ wouldn’t name the company, but it appears from the company website that the PhytoEnergy Group, has established PhytoEnergy of Southern Africa (Pty) Ltd. to take a lead in the East London biodiesel project as well as in the agri-business development.⁷⁰ As canola is a relatively new and unfamiliar crop in South Africa, PhytoEnergy will deploy key personnel to provide on farm technical support.⁷¹

The investors have already entered into an off-take agreement with a European wholesaler that will purchase 70% of the biodiesel produced. They are specifically interested in canola oil because it freezes way below minus –20°C and is thus suited to European conditions. In comparison, sunflower oil freezes below –10°C and soya oil below –5°C.

Production is planned for late 2009 or early 2010, but the intercropping programme is expected to take 3-5 years to achieve full production, so in the meantime feedstock will need to be supplemented. It is not clear where this will come from.⁷²

Coega IDZ – Rainbow Nation Renewable Fuels (RNRF)

Biodiesel from soya

Planned plant production capacity per annum:

1 360 000 tons of soya processed
 288 million litres of biodiesel with 26 000 tons of glycerine produced
 or 250 000 tons of soy oil produced
 1 100 000 tons of soybean meal produced

Expected direct jobs:

800 during construction, 350 people at the processing facility
 725 in related industries (not including agriculture)

Capital investment (estimated):

R1.5 billion

Expected to be in production by end 2009

Source: Geoff Mordt. Managing Director, Rainbow Nation Renewable Fuels.

Rainbow Nation Renewable Fuels (RNRF) is the South African subsidiary of National Biofuels Group, a privately owned Australian company.⁷³ The proposed plant has the capacity to produce soya oil or biodiesel. The company will decide which product to make based on industry economics, although they have just been licensed as a biofuel manufacturer by the DME. All the products produced at the plant are intended for sale in the local market.

The company is actively involved with AsgiSA and the Eastern Cape Agriculture Department to procure the soya beans that will be grown as part of the Intercropping programme, and will provide technical support to try and raise the soya yield in the Eastern Cape. RNRF will be looking to enter pre-planting contracts on a year-to-year basis with individual farmers, co-ops and other agencies.

South Africa produced 424 000 tons of soya in the 2005/06 planting season.⁷⁴ Although this has been increasing yearly, national production would only meet a third of RNRF's requirements at full production (expected from the 5th year of operation). Thus although this is being touted as a project to develop agriculture in the Eastern Cape, the company will source soya throughout South Africa and will also import soya from Latin America to make up the shortfall in the supply of beans. It is very likely that this will be GM soya coming from Latin America's largest soya producer, Argentina. When asked if RNRF would accept GM soya, MD Geoff Mordt dismissed the issue by replying that 80% of soy grown in South Africa is GM.⁷⁵

Cradock sugar beet joint venture between Sugar Beet SA, the IDC and CEF

Ethanol from sugar beet and maize

Planned plant production capacity per annum:

90 million litres ethanol

75 000 tons of animal feed

Expected direct jobs:

167 people at the processing facility

Capital investment (estimated):

R1.6 billion

Source: AGES (Pty) Ltd., EIA Scoping Report for the Proposed Cradock Ethanol Plant

A German agronomist, Volke Fischer, began sugar beet trials all over the Fish River valley area ten years ago in an attempt to find alternative agricultural crops for the Cradock area. The ostensible success of the trials (on average over 100 tons of beets were produced per ha with a sucrose content of up to 20%), persuaded the Eastern Cape Agricultural Cooperative that sugar beet was a suitable new crop to introduce in areas serviced by the Fish River Valley irrigation scheme. The Cooperative set up Sugar Beet SA to promote the idea and attract funding, but they failed to persuade local farmers to switch to sugarbeet due to low sugar prices. However, the potential agrofuels market has revived the idea of a sugar beet industry in the area. In 2006, Sugar Beet SA attracted the CEF and IDC as investors and the Cooperative sold Sugar Beet SA⁷⁶ to the Eastern Cape parastatal Uvimba Finance.⁷⁷

An environmental impact assessment for the project is currently underway, and the final environmental scoping report was released for comment on 18 September 2008.

Three potential sites for the processing plant in Cradock are proposed in the EIA.⁷⁸ The mill and growing area need to be in close proximity, because no more than 48 hours should expire to get the sugar beets to the mill as they start fermenting^v as soon as they are removed from the ground.⁷⁹ Residents of Cradock are extremely concerned about the air pollution that could be emitted by the

^v Kevin Kavanagh, the National Sales Manager for Illovo was of the opinion that that sugar beet was a non-starter in South Africa as the climate is too warm. He said that in Europe beets are harvested in very cold weather as they can combust in warm spells due to the quick fermentation process. CEF do not see early fermentation as a problem since the mill will be built within the beet growing area.

ethanol plant. International experience indicates that emissions from similar plants cause headaches, nausea, respiratory problems and cancer.⁸⁰

According to the EIA report a core farming estate of 5574 hectares owned by the processing plant company will be established in proximity to the plant to supply 30% of sugar beet and 50% of the grain required.⁸¹ The balance of the feedstock is expected to come from existing and emerging farmers in equal proportion⁸² from an area of about 13 800 hectares. This could be increased to 25 000 hectares if irrigation and water rights were extended.

Surprisingly, plans still include yellow maize as an additional feedstock to make the plant viable despite the fact that maize is specifically excluded as a source of biofuel in the national strategy. The plant is planning to process sugar beet for 240 days in the year, and grain for 98 days. In addition the maize volume will increase every third year as it is planned as a rotational crop for the beets. The maize and beets will be respectively cooked then mashed and juiced in separate processes but then share a common fermentation and distillation plant.

Pondoland ethanol projects - J&J Bioenergy and IDC

Ethanol from sugar cane and possibly sweet sorghum

Planned plant production capacity per annum:

2.4 million tons of biomass processed
200 million litres of ethanol produced

Capital investment (estimated):

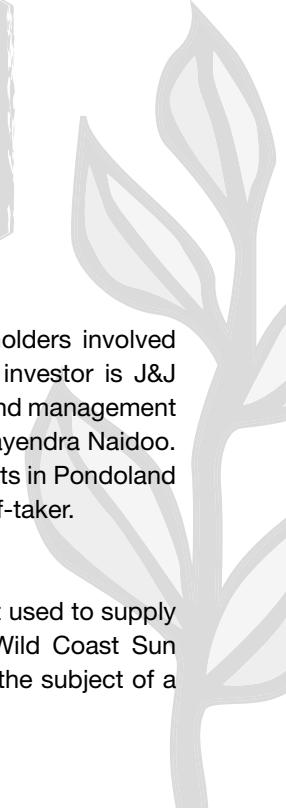
R1.7 billion per factory

Source: Steve Collins, CEO of J&J Bioenergy

AsgiSA takes the credit for bringing the task team of stakeholders involved in the Pondoland ethanol projects together.⁸³ The main private investor is J&J Bioenergy, a subsidiary of the J&J Group, an investment holding and management company founded by anti-apartheid stalwart activists, Jay and Jayendra Naidoo. The task team intend to complete feasibility studies for two projects in Pondoland by the end of 2008. Both projects will supply the same refinery off-taker.

Bizana area

The first area being investigated is an old sugar growing area that used to supply the Umzimkulu Mill in Port Shepstone, situated between the Wild Coast Sun and Bizana and about 20km from the coast. The area has been the subject of a



protracted land claim. A feasibility study is testing 30 000 hectares to ascertain if it can produce 2.4 million tons of biomass that will contribute to producing agrofuels. The task team is still in the process of identifying sites for the distillery. This distillery will crush the cane for juice and ferment this to ethanol, instead of using molasses as happens currently in sugar ethanol plants in South Africa.

The company is exploring non-GM species of ‘power canes’ that are high in fibres and fermentable sugar. They are also involved in field trials of non-GM sweet sorghum in collaboration with the Agricultural Research Council (ARC). J&J’s Bioenergy CEO, Steve Collins, explains that the stalks of the sorghum are used for ethanol production, but these must be harvested before full seed heads have developed or the sugars will be lost. The company plans to use the partly developed grains to make products like cattle feed, beer or biscuits and are in discussion with Old Mutual to support this and other ethanol related products.

The company is looking at a highly mechanised farming operation, to avoid harvesting the cane by hand, which incurs high initial capital costs. In order to recoup these costs and ensure profitability through increased productivity, the land will be leased from communities, and farmed by a community and a private sector joint venture management company. This company will be responsible for making jobs available to the community and training workers in mechanised cane farming. The company hopes to raise R100 million to buy a community stake in the distillery as part of the compensation for leasing the land.⁸⁴

Re-introducing an intensive, mechanised and perennial mono-crop such as cane in the area will preclude using the land for food production and gathering of building and medicinal materials. This will require communities to establish intensive, communal food production areas or be forced into an entirely cash economy. At the moment the land is mainly used for grazing livestock. Collins suggests that communities can substitute grazing by raising livestock at feedlots making use of the distillery by-products.

Sugar cane is also infamous for impacting on water supplies, both in terms of it being water hungry and through pollution from run-off from the chemical inputs. The area has access to irrigation, but the project is looking at rain-fed cane and possibly irrigation for the sorghum in winter, should the trials prove to be successful.

Paddock/ Izingolweni

The second project is across the river near Paddock, where the feasibility of building and supplying an additional distillery is being investigated. The distillery will draw cane from existing areas, such as around Harding, as well as establishing

new planting areas on communal land. (This project falls between the provinces of the Eastern Cape and KwaZulu-Natal.)

KwaZulu-Natal Province

Amatikulu - J&J Bioenergy

J&J Bioenergy are exploring another project in Amatikulu between Tongaat and Empangeni in KwaZulu-Natal. However, this project is with existing but struggling commercial sugar cane farmers, and therefore might not proceed as it does not meet the criteria set by the current biofuels strategy.

Makhathini ethanol plant – IDC and CEF partnership

Ethanol from sugar cane and possibly cassava

Planned plant production capacity per annum:

100 million litres ethanol

Bagasse for power generation to grid

Expected direct jobs:

70 people at the processing facility

Source: Sibusiso Ngubane. Commercial Manager. Central Energy Fund

An EIA has been initiated for the construction of an ethanol distillery at Jozini on the Makhathini flats. According to CEF, the partners are still conducting the feasibility study for making ethanol from fermented sugar juice crushed from the green cane (instead of from molasses), in combination with generating electricity from the bagasse. Tongaat-Hulett are members of the feasibility team. The IDC is also running trials to test cassava as a source of sugar juice.

This project is one of the special provincial projects identified within AsgiSA. The area identified includes large amounts of communally owned land with good soil and a favourable climate for sugarcane. The project is focused on skilling emerging farmers, who will comprise 80% of the farmers involved in the scheme.

As discussed previously, sugar cane impacts heavily on water resources. The project proponents have emphasised that local communities have been given the rights to access water from the Jozini Dam.⁸⁵ However, this is a meaningless reassurance as there is already a critical shortage of water as a result of the impacts of timber plantations and unlicensed boreholes, as evidenced by the Jozini water

treatment works running dry 3 months of the year.⁸⁶ This critical situation can only worsen with increased cane plantations.

Mpumalanga

Hoedspruit ethanol plant – IDC and CEF partnership

Ethanol from sugar cane and possibly sorghum

Planned plant Production capacity per annum:

100 million litres ethanol

Bagasse for power generation to grid

Expected direct jobs:

70 people at the processing facility

Capital investment (estimated):

R1.6 billion

Expected to be in production by end 2009

Source: Sibusiso Ngubane. Commercial Manager. Central Energy Fund

CEF and the IDC are currently investigating the feasibility of establishing a sugar cane plantation within a 60km radius of a new ethanol distillery that will be built near Hoedspruit. There are roughly 9000 hectares of land with access to the Lower Blyde Pipeline irrigation network, of which 6000 hectares could be converted to cane production.⁸⁷ The project aims to supply 40% of the feedstock from previously disadvantaged farmers,⁸⁸ who will be identified in the Hoedspruit, Acornhoek, Bushbuckridge and Mametja and Willows areas.⁸⁹

Limpopo

Mapfura-Makhura Incubator (MMI) – Agricultural Research Council (ARC) development project, funded by the Department of Science and Technology and the Limpopo Department of Agriculture

Biodiesel from soya and sunflower

Planned plant production capacity per annum:

1 million litres of biodiesel

260 tons of soya and sunflower to be processed in demo plant

Expected jobs: 10 people in biodiesel plant

Expect to complete plant construction by March 2009

Source: Charles Siphugu, Business Development Manager. MMI

The MMI Incubator was initiated by ARC in partnership with the Limpopo Department of Agriculture in 2006, in response to a Department of Science and Technology funding call to empower small-scale farmers to participate in the agrofuels industry. The Department of Trade and Industry's Small Enterprise Development Agency (SEDA) who approved the business plan is now a key funding partner. Agencies involved in the project decided to establish the MMI as a section 21 company as the project progressed. The programme is focused around a 'biodiesel production technology incubator' at the Tompi Seleka Farmer Development Centre, 30 kilometres from Marble Hall. The aim of the 'incubator' is "to facilitate economic development by improving the entrepreneurial base of emerging farmers through the provision of infrastructure and a variety of business support services"⁹⁰

A service provider was recently appointed for construction of the processing plant and the site has been surveyed and construction has begun.

ARC conducted a feasibility study, which found that sunflower and soya were the best crops to proceed with as these, according to them, are reasonably well known by farmers and suited to the Limpopo area. The project started working with emerging farmers in the Sekukhune District. The development model is based on farmers growing the crops on their own land and selling these on to the biodiesel plant. Farmers sign an 'incubation agreement' through which they are provided with seeds, fertiliser and training in production skills and business development. Under the contract the farmers must stay in the programme for 3 years to repay this start-up assistance. Farmers are encouraged to group together in small co-operatives. An over-arching co-operative was established to oversee

the smaller ones and achieve economies of scale in purchasing inputs. There are a few commercial farmers involved in the project who assist with mentorship. Thirty farmers have been added to the programme each year and there are ninety farmers involved currently.

The programme partners intend to establish the first plant as a demonstration, which will be expanded to other areas in 2009 with the eventual aim of going nationwide. Biodiesel produced at this first plant will be sold to mines in the area, but the programme is aimed at the export market in the long term.⁹¹

Farmers have thus far not used GM soya as they are concerned about the response that animal feed manufacturers will have to GM and are concerned about potential consumption as human food if the oil produced at the plant was used for cooking oil instead of biodiesel.⁹²

North West

Mafikeng Biodiesel Company – Invest North West, Barolong Bo-Ratschidi Development Company and D1 Oils.

Biodiesel from oil bearing trees

Expected jobs:

800 jobs in first 3 years including in the nursery, the plantations and management.

R4.7 million invested in first phase of the project, total costs expected to be R850 million

Source: Invest North-West⁹³

This project began in 2003, spearheaded by research conducted at the University of Pretoria. Initial funding for research and development was provided through the province's investment promotion arm, Invest North West, by the provincial Department of Economic Development and Tourism.⁹⁴ The Barolong Bo-Ratshidi Development Company (a tribal development authority), is a majority shareholder in the company, having committed 45 000 hectares of land to the project in an area south of Setumo Dam. The Mafikeng Biodiesel Company was officially launched in May 2006 as a public-private partnership, with other stakeholders including Mafikeng Bio-Technologies, Clean Air Nurseries and the Mafikeng Industrial Development Zone company.⁹⁵

The first phase of the project involved setting up a nursery and studying potential oil bearing trees including *Jatropha curcus*, *Moringa* and two indigenous plums *Ximenia caffra* (sour plum) and *Pappea capensis* (jacket plum).

The project was temporarily put on hold in early 2007 due to a dispute with Diprojeke, a private company managing the project.⁹⁶ Although the project had resumed in June 2007, it was then put on hold when the Biofuel Industrial Strategy was published excluding *Jatropha*. Seedlings are growing at the nursery but none have been transplanted and no plans have been made with potential growers. It was originally intended that community cooperatives would be set up to tend the plantations, and sell the oil to a refinery planned for the Mafikeng Industrial Development zone. Further development is contingent on the outcome of a feasibility study currently being carried out by a German company to see if the project is viable without making use of the exotic trees.⁹⁷

Early on in the project, Invest North West had also been in discussion with D1 Oils, a London-based company, which has since entered into a partnership with BP aimed at cultivating 1 million hectares of *Jatropha* worldwide to supply oil to the European market. D1 Oils had entered into an agreement with Invest North West where they would access 10 000 ha of land for growing *Jatropha* in exchange for their expertise in establishing nurseries and growing the plant.⁹⁸ D1 Oils submitted an Environmental Impact Assessment for growing *Jatropha* in November 2005.⁹⁹ D1 Oils currently have a large and controversial *Jatropha* out-grower scheme in Swaziland.



massively industrialising the eastern cape



Since 2004, the Eastern Cape provincial government has been facilitating a process of ‘agrarian reform’, focused on converting small holder farmers to industrialised agriculture. It has done this through two main programmes:

1. The Massive Food Production Programme, which provides government subsidies for input supplies, mechanisation, marketing and agro-processing initiatives aimed at encouraging consolidation of land for commercial production purposes, particularly in the former homelands – the Transkei and Ciskei.
2. The Siyakhula Step-Up Commercial Food Production Programme subsidises small-scale farms (farm size between 1 and 50 hectares) through a conditional grant scheme whereby farmers pay deposits towards the next season’s crop inputs in order to secure funding from the government.¹⁰⁰

In its early stages, the Massive Food Production Programme focused on increasing maize production, by subsidising seed and input packages supplied by the agribusiness multinational, Monsanto South Africa.¹⁰¹ The programme was first initiated as a pilot in the Mbashe area in July 2005. Former Deputy President Phumzile Mlambo-Ngcuka visited the Mbashe area in August 2008 to review progress and in her speech to the community promised “a massive intervention to ensure the economic growth of communities involved in the large scale Massive Food Production Programme, which is part of the Green Revolution Strategy piloted there.”¹⁰²

The Green Revolution

The ‘Green Revolution’ is a term coined by the United States Agency for International Development (USAID) in 1968 to refer to programmes to increase crop production in Latin America, India and South East Asia in the 1940s and 1950s. This so called ‘revolution’ was originally initiated and funded by the Rockefeller Foundation, and involved pushing a technology package that included chemical fertilisers and pesticides, hybrid seeds, and massive

agricultural infrastructure. Although attempts were made to introduce the first ‘Green Revolution’ to Africa in the 1970s this had little impact at the time. In 1999, the Rockefeller Foundation launched a ‘New Green Revolution’ aimed wholly at Africa. In much the same vein as its predecessor, this new programme is focused fundamentally on the introduction of new hybrid and genetically engineered seeds; as well as the training of local scientists and policy-makers, facilitation of public-private partnerships to develop irrigation and other infrastructure to get products to the market, the widespread introduction of inorganic fertilisers and other inputs, and the development of local ‘agro-dealers’ to ensure that farmers buy these inputs.¹⁰³ In 2006 further impetus was given to this programme when the Rockefeller Foundation forged an alliance with the Bill and Melinda Gates Foundation, giving birth to the ‘Alliance for a New Green Revolution in Africa’ (AGRA). The New Green Revolution has been likened to “a Trojan horse paving the way for transnational agrochemical, fertiliser and agricultural biotechnology companies to peddle their wares”.¹⁰⁴

The Eastern Cape provincial Department of Agriculture (DoA) have adopted their own ‘Green Revolution Strategy’, called the Massive Food Production Programme. This strategy has a similar approach in that it is underpinned by expanding infrastructure and technological development and research, and “links international markets to domestic production with backward integration reaching right into the heart of the rural areas”.¹⁰⁵ Central to the Eastern Cape’s Green Revolution is the introduction of an industrial farming package, which replaces the diverse and integrated traditional farming practices in the area with monocrop production using agribusiness inputs. The multinational and genetic engineering giant, Monsanto South Africa, has been intimately involved in this. Government spent R350 million in the first five years of the programme, with the bulk of it being used as subsidies to enable the emerging farmers to purchase Monsanto’s ‘combi-packs’ of hybrid and GM seeds and related chemicals. Various multinational companies linked to the distribution of Monsanto’s products provided training to the DoA extension officers, aimed primarily at introducing Roundup Ready seeds as well as insect-resistant (Bt) maize seeds (YieldGard seeds) and the use of herbicide to the farmers.¹⁰⁶ The Eastern Cape Department of Agriculture are convinced of the success of this programme and have committed to making the Green Revolution the overarching Strategy for the Department’s Five-Year Strategic Plan.¹⁰⁷

The likely impacts of this strategy are summed up in a recent article on the Massive Food Production Programme published by GRAIN titled ‘Lessons from a Green Revolution in South Africa’:

“Once farmers are trapped in the system, the subsidies are withdrawn and farmers become indebted, creating the space for local elites to step in and gain land and power. Hey presto! A new customer base and market for GMOs, hybrids and agrochemicals is created. The scheme may come with slick propaganda about improving food security, but it hides the agony of debt, the continued loss of land, seed and communities, and the poisoning of people, soil and water.”¹⁰⁸

The Massive Food Production Programme has since been expanded under the aegis of a new ‘Integrated cropping programme’, which is directly linked to agrofuels production. This new programme is aimed at converting 500 000 hectares of land to rotational crops of maize and soya in summer, and canola (rapeseed) in winter, over a 5 year period.¹⁰⁹ The additional winter crop is meant to assist in paying for investment in mechanisation, rural infrastructure and other input costs required for this type of large scale industrial agriculture project. In 2007, the provincial Eastern Cape Agriculture department set aside R9.5 million¹¹⁰ to begin the process of converting land, commencing with the demarcation of 70 000 ha, fencing 30 000 ha of this and undertaking land preparation and liming.

The MEC for the Eastern Cape Department of Agriculture, Mr Gugile Nkwinti, noted in his 2008 policy speech that this integrated crop production programme “is the catalyst for accelerated rural economic development and forms the basis for a mega-project to be established through the AsgiSA Eastern Cape programme during 2008/9.”¹¹¹

Agricultural reforms as well as various Eastern Cape infrastructure developments are now being coordinated and funded under the umbrella of AsgiSA Eastern Cape Pty Ltd. This is South Africa’s first parastatal specifically established to manage AsgiSA investments and mitigate the risk to potential private investors. The provincial government is the sole shareholder in the company launched in May 2007.¹¹² AsgiSA Eastern Cape priorities for 2008 includes the fast-tracking of a programme to shift 70 000 households into cropping, claiming that households should achieve increased food security as well as some sales of maize, cotton and canola seeds, which will feed a major new biodiesel plant geared primarily

for exports.¹¹³

This agricultural project is linked to the other ‘mega-project’ falling under AsgiSA - the Umzimvubu Basin Water Project. This includes plans to build a new dam and hydro-electric scheme as well as supplying irrigation to a large section of the former Transkei including the new Canola production programme.¹¹⁴

According to Simpiwe Somdyala, AsgiSA Eastern Cape’s Chief Executive, 51 000 hectares have so far been identified together with interested communities, and business plans are being developed. A variety of land use models are still being investigated. In some areas people want to farm, but in others the land will be leased from communities. How communities will be compensated - in cash, shares or a portion of the crop – is still the subject of debate, but Somdyala notes that they are looking for the right mix for poor people to access both money and food. AsgiSA is also brokering off-take agreements on behalf of the farmers. This year they have started with maize plantings, investing R40 million to lever R300 million for the project in the longer term. The Development Bank of South Africa (DBSA) has shown an interest in investing together with the IDC.¹¹⁵

The Eastern Cape government also set aside R8 million for kick-starting the Cradock sugar beet project, discussed above.¹¹⁶ The Department has indicated that it intends setting up an Eastern Cape Bio-fuel entity that will manage the integrated cropping and investments to develop a competitive biofuel industry in the province that “advances the interests of landowners while taking advantage of BEE opportunities.”¹¹⁷



the sugar industry waiting in the wings



South Africa's commercial sugar companies are not making immediate plans to produce agrofuels in South Africa as most feel that the current policy environment does not support commercial investment in fuel ethanol. However, Dr Adrian Wynne from the South African Cane Growers Association noted, "everyone has done the paperwork and feasibilities for when the legislative environment comes right".¹¹⁸ *The Mail & Guardian* reported that the sugar industry was looking for a R2 per litre subsidy (far more than current fuel tax exemption) to supply ethanol to the fuel market, but failed to explain where they got this figure from.¹¹⁹ Several companies including Illovo, Tongaat Hulett and NCP Alcohols, already produce fermentation ethanol from molasses for potable alcohol, personal care and pharmaceutical industries. However, producing fuel ethanol would require capital investment in new equipment, which is currently not economically attractive to the sector.

Dr Wynne also notes that it is difficult to attract new emerging farmers to the sugar industry, as is required by the Biofuel Industrial Strategy. Mechanical harvesting requires capital and loses too much material in hilly areas, but manual harvesting is very hard work, so people prefer jobs in sectors like construction. However, there is new technology on a smaller scale that helps to cut the cane but still requires labour.¹²⁰

Illovo

Illovo, South Africa's largest sugar company, currently produces ethanol at a plant in Merebank in Durban. The National Sales Manager for Illovo, Kevin Kavanagh, explained Illovo's reticence to invest in fuel ethanol production at this time. After fermentation of the molasses, Illovo distils this four times to produce ethanol that is 96.4% pure. For fuel, the ethanol must be 99.9% pure (or it would be immiscible in the petrol), but this would be expensive to achieve using the same distillation process. Kavanagh notes that ideally there should be one distillation process followed by chemical dehydration to be cost effective and this would require new processing equipment. Molasses is a by-product from sugar production, but there is currently a short-fall in the market. Since growing cane for molasses alone is not profitable without a market for the sugar, Illovo would need to provide farmers with

an incentive to grow cane specifically for ethanol. In addition, to produce sufficient volumes for fuel would currently require that molasses is trucked to Durban from all over KwaZulu-Natal. Distilleries would have to be built at the mills to prevent these transport costs.¹²¹

Since fuel ethanol is currently not selling at a higher price than other ethanol, Illovo will only invest in fuel ethanol production if there is long term viability in this market. This depends on the basic fuel price and the price oil companies are willing to pay for ethanol. Barry Cornish, Operations manager of Merebank Illovo Sugar noted “If government legislated that fuel must contain a percentage of ethanol that would change the market”.¹²² Illovo is looking at other countries like Zambia where the energy policy is more conducive to this investment.¹²³

TSB Sugar

TSB Sugar have, in partnership with an Italian company, Compagnie Industriali Riunite (CIR), set up a subsidiary company, Resource Energy, to develop ethanol projects in Latin America and Africa,¹²⁴ but not in South Africa. According to managing director Hennie Snyman, TSB believe that “the ethanol business could be very successful in South Africa, but without a mandatory government policy that will ensure that we make money out of it, we cannot invest in it.”¹²⁵ The company’s main expertise in ethanol distilling lies in Swaziland through a 26.2 % stake in the Royal Swaziland Sugar Corporation (RSSC).¹²⁶ TSB’s subsidiary company Booker Tate Ltd, which provides management and technical services to RSSC, has been managing and expanding agro-industrial enterprise around the globe for 50 years. In particular it has managed the construction of fuel ethanol distilleries in the United Kingdom and Papua New Guinea, and sees fuel ethanol as its focus area for the future.¹²⁷

NCP Alcohols

NCP Alcohols, based in Durban, is Africa’s largest producer of fermentation ethanol at 180 000 litres a day of which 67% is exported. In 2001, the company was purchased by Belgium-based AlcoGroup, which accounts for 8% of the global ethanol trade including for fuel. Marketing manager, Graeme Davidson, echoed the sentiments of others in the sugar industry, “NCP are taking a wait and see approach until the biofuel strategy is reviewed. The current strategy is not conducive as one only gets rebates if the raw material is from previously disadvantaged areas, so our existing molasses supply doesn’t count”.¹²⁸

Tongaat Hulett

Tongaat Hulett's investment in renewable energy in South Africa is currently focused on ensuring energy security in the face of predictions that electricity demand in South Africa will exceed generating capacity for a five to seven year period. The company is in the process of finalising agreements to co-generate power from biomass at four sugar mills and two starch plants.¹²⁹

In the meanwhile the company is looking to produce fuel ethanol in Mozambique in two to three years,¹³⁰ as Mozambique has preferential duty free access to the European Union market. To this end they have actively expanded production in Xinavane near Maputo and Mafambisse near Beira. The company planted an additional 3 500 ha of cane in 2007 and plan to expand by another 5 000 ha in 2008, while they are upgrading the mills in both locations.¹³¹ At Mafambisse the new Muda dam has been constructed to provide water to the expanding cane plantations through pivot irrigation systems.¹³² The company has also signed an MoU with COFOMOSA Farmers Association to grow cane on 29 000 hectares of land in Moamba near the Xinavane mill, which aims to produce 105 million litres of ethanol per annum.¹³³

The company has identified the Amatikulu mill on the north coast of KwaZulu Natal for fuel ethanol production¹³⁴ should it pursue this in South Africa. The company is exploring producing ethanol from the surplus raw sugar it would normally export, having calculated that it could generate around R600 million profit at an oil price of \$92 per barrel. This is based on producing 280 million litres of fuel ethanol from 500 000 tons of raw sugar.¹³⁵ However, the company's sugar exports have been declining in 2006-8 due to adverse growing conditions and a reduction in growing area supplying South African mills, increasing the cost of sugar per ton.¹³⁶

GM sugar cane

Dr Wynne from the South African Cane Growers Association is of the opinion that the industry is actively looking at genetically modified cane to reduce input costs, especially increasingly expensive fertiliser costs, but that no-one wants to make the first move because consumers aren't ready. His reasoning is that if higher yields can be obtained through pest resistance, growers can then reduce their fertiliser inputs to maintain current yields.¹³⁷ The South African Sugar Association and others report that 'energy cane' with more fermentable sugar is also being looked into for the longer term.¹³⁸

discussion and analysis: implications and key concerns



Cooling down the commercial agriculture sector

The exclusion of maize and *Jatropha* as feedstock crops, the emphasis on emerging farmers and the withdrawal of mandatory blending of agrofuels in the fuel supply, have had a dramatic cooling effect on the grandiose agrofuels plans made by the commercial agriculture sector. The sector is disappointed with the ostensible lack of leadership on the part of the Department of Minerals and Energy in failing to clarify the practical operational issues with regard to ethanol blending and tax rebates. This is creating a wait-and-see attitude amongst potential ethanol manufacturers. However, investment has already been made in feasibility studies, and in the case of Ethanol Africa, development to plant construction stage. The commercial grain and sugar sectors can be expected to swing into action should government make any policy and fiscal changes in their favour.

Biodiesel projects are currently not an attractive investment for potential developers, because of the rapid increase in the price of edible oils in South Africa and internationally. The average current price of edible oil at R21.60 per litre¹³⁹ is more than double the pump price of diesel. Sibusiso Ngubane, Commercial Manager of CEF, which was to partner Sasol and Siyanda Biodiesel in building a soya biodiesel plant, said that he didn't think the project was going ahead as "one can't move ahead with energy when the food price is higher".¹⁴⁰

The Louis Dreyfus commodities company, one of the world's largest grain and oil seeds traders, established a new vegetable oil trading unit in Durban in November 2006 in anticipation of the growing agrofuels market. Their aim was to "provide tailor-made supply and off-take solutions to the developing biodiesel industry".¹⁴¹ This year a representative said that the company doesn't see biodiesel being viable unless "crude oil goes to \$200 a barrel or until government provide subsidies".¹⁴²

Agrofuels: the impetus to extend agribusiness markets

The main agrofuels projects that continue to be developed are those being facilitated by government and parastatal institutions, in partnership with provincial agriculture departments and the Industrial Development Zones. These have two key thrusts: developing new sugar plantations in KwaZulu-Natal and Mpumalanga and the complex web of partnerships driving a Green Revolution push in the Eastern Cape.

The Biofuels Industrial Strategy, with its emphasis on emerging farmers and ‘under-utilised land’, is providing new impetus to drive industrial agriculture into areas that were previously closed to agribusiness. The large-scale monocultures proposed in these developments will leave little space for the integrated and diverse indigenous farming systems that ensure true food security; and provide other benefits such as building materials and medicines. Currently the Eastern Cape is the province with the majority of livestock in the country, most of which is found in the former homeland areas.¹⁴³ Large-scale monocrops, especially sugar plantations, will force livestock into unhealthy feedlot systems that create further financial burdens for communities, and will eventually erode the systems of livestock ownership around which people’s culture is structured. While local communities forego food diversity, communal grazing lands and their independence, loans and subsidies will be paid on their behalf to multinational companies.

The myth of ‘under-utilised’ land

The Biofuel Industrial Strategy specifically targets ‘under-utilised’ land for agrofuels development, estimated at 3 million hectares.¹⁴⁴ This is consistent with global policy trends to describe land allocated to growing agrofuels as ‘marginal’ or ‘wasteland’ to downplay using this land for fuel instead of food. In South Africa this so-called ‘under-utilised’ land is mostly in communal, former ‘homeland’ areas. Contrary to the impression given, communal land in southern Africa supports the majority of the rural population, by providing a wide range of resources contributing to rural livelihoods. The land is used for cultivating a mix of crops; grazing animals; and collecting firewood, construction materials, craft materials, medicines and wild foods.¹⁴⁵ These resources are used for home use and for sale. For example, thatching grass is a major source of income for rural communities in the Eastern Cape.¹⁴⁶ To dismiss the land that provides these resources as ‘under-utilised’ is not only arrogant but also short-sighted in that it

fails to recognise the complex and interdependent strategies that are employed by rural communities to ensure both survival and the cementing of social and cultural relations. In essence, however, the denigration of these areas as ‘under-utilised’ is simply a tool to justify grabbing land for industrial agriculture where the profits can easily be quantified and accrued to shareholders, in the process destroying these diverse rural livelihood strategies and leading to the destabilisation of rural communities and their eventual displacement from the land.

The mechanism for land grabs

Most of the described agrofuels projects are still exploring the contractual mechanisms by which the land in former homeland areas will be secured for agrofuel production. This could include leasing of the land from communities, contract farming and out grower agreements. These need monitoring, and communities may need assistance in interrogating these contractual arrangements to investigate and ascertain whether:

- they remain in control of decisions about how the land will be used,
- they receive fair compensation when land is utilised for agrofuel production,
- people do not become slave labour on their own land,
- people have a livelihood while crops that are not harvested annually are growing,
- communities can terminate contracts without unjust penalties if they find that agrofuel production is not appropriate,
- communities do not end up losing their land.

Impacts of expanding the use of GM crops in the agrofuels programme

Ten years after the first commercial GM crops were introduced in South Africa, the technology has not been adopted by smallholder farmers, except where they have been coerced to do so through agricultural development programmes that have tied agricultural investment, extension services and subsidies to the adoption of GM seeds and related chemical inputs. Disregarding the lessons to be learnt from the disastrous introduction of GM Cotton in the Makhathini flats¹⁴⁷,



government has provided GM corporations with another opportunity to pry open the emerging farmer market through the Massive Food Production Programme, by conveniently subsidising and promoting GM technology. Monsanto's Roundup Ready and insect resistant YieldGard maize has already been introduced, together with Roundup herbicide.

The 'Integrated cropping programme', which expands on the Massive Food Production Programme to facilitate agrofuels production, provides for the expansion of GM crops on a grand scale by introducing two more global GM crops: soya and canola.¹⁴⁸ GM soya is already approved in South Africa and the majority of soya grown in South Africa is also Roundup Ready, but a permit application to grow GM canola has yet to be lodged in South Africa. The introduction of GM and other hybrid seeds through the Massive Food Production Programme has already contributed to farmers losing their traditional farmer varieties of maize, which are much tastier and produce well in the local climate and conditions.¹⁴⁹

Roundup Ready crops are tolerant to the glyphosate-based herbicide, Roundup, which is sold worldwide by Monsanto to combat weeds, and is a key tool in the no-till farming method they have been promoting as part of their technology package. The use of herbicide tolerant crops encourages broad-scale spraying, which increases its use. Products containing glyphosate are acutely toxic to animals and humans, negatively impacting on the biodiversity and people in the area it is used. Symptoms include eye and skin irritation, headache, nausea, numbness, elevated blood pressure, and heart palpitations. Exposure to glyphosate is also associated with an increased risk of miscarriages, premature birth, and the cancer non-Hodgkin's lymphoma.¹⁵⁰ In addition the GM crops themselves impact negatively on biodiversity and are increasingly being shown to be unsafe to eat.

The newly licensed biodiesel plant at Coega is likely to have a soya bean shortfall, which will be supplemented by imports from South America. This is most likely to be GM soya from Argentina, which is the biggest exporter of GM soya worldwide. GM soya cultivation and related herbicide use in Argentina, Paraguay, Bolivia and Brazil continues to have devastating consequences on the social fabric and health of communities and is resulting in the clearing of rainforest and violent land appropriation.¹⁵¹

Globally the development of agrofuels is giving the biotech industry a new boost. In the face of fierce opposition to the consumption of GM foods, and unable to deliver on the promise that "GM crops will solve world hunger", the biotech industry have changed tack to promote GM technology as a new climate change solution. The industry is promising 'climate-ready' crops that supposedly will be able to handle droughts and other weather stresses; 'energy' crops designed to

optimise ethanol production and new microbes for converting ‘waste’ biomass to ethanol. On 3 November 2008, Monsanto Company announced that it was acquiring the Brazilian sugarcane breeding and technology companies, CanaVialis and Alelyx, to diversify its core crop portfolio in the face of the greater global demand for agrofuel.¹⁵²

Clearly Monsanto and allied corporations have won over decision-makers. Already integrated into the government’s agricultural extension service, and with the concerted agrofuels push as a ruse, we can anticipate further pervasive distribution of GM and related technology in the remaining communal farming areas unless communities take a strong stand against this destructive technology.

Agrofuel impacts on food security and supply

At the household level, dramatically rising food prices are threatening the food security of many families. The year-on-year (i.e. July 2007 to July 2008) increase in the Consumer Price Index for food in urban areas was a whopping 17,8 % compared to the overall consumer price index increase of 13,4%.¹⁵³

Although maize has been excluded from use as an agrofuel feedstock in South Africa, the impacts of increased global grain prices as demand for grains for agrofuels grew, has also been felt locally. It is also important to note that a market for agrofuels crops may cause farmers to switch production from food to agrofuels crops, adversely affecting local food supply and costs, and this will need vigilant monitoring.

The increase in the price of cooking oil has made a major contribution to the rise of food prices in the last two years. The price of cooking oil and rice increased the most of all basic foods, with sunflower cooking oil increasing on average by 99,15%.¹⁵⁴ This corresponds to international commodity trading where the price of all oilseeds has increased by 94% in the same period and 140% over the last two years.¹⁵⁵

South Africans consume far more vegetable oils than the country produces, requiring expensive imports in the face of a high international prices and a weakening Rand (South African currency). In the last year vegetable oil imports amounted to about 650 000 tons¹⁵⁶ compared to production of sunflower seeds at 300 000 tons (which mostly is pressed for oil) and consumption of 133 000 tons of oil from soya.¹⁵⁷ Local farmers price oilseeds on the South African Futures Exchange (Safex) in line with world markets. Although South Africa traditionally used sunflower oil for cooking, soya oil and especially palm oil imports have

soared since 2000 as refiners chose to import these cheaper crude oils rather than paying a premium on local oilseed which has been processed locally. The processors, and the bulk catering industry, which has largely switched to palm oil, are now suffering the consequence of biofuel demand steeply pushing up the price of palm oil.¹⁵⁸ This led to the Chairman of the South African Oil Processors Association (SAOPA) appealing to Finance Minister Trevor Manuel to reduce the 10% import duty on edible oils and oilseeds, which would also translate into lower prices on oilseeds traded on Safex.¹⁵⁹

The FAO predicts that global oilseed prices will stabilise in the coming year, but oil meal for animal feed will still be in high demand internationally to make up for a shortfall in maize.¹⁶⁰ However, when looking at the real prices (i.e. nominal prices corrected for inflation) of commodities in the coming decade they predict price increases of 30% for butter, coarse grains and oilseeds and over 50% for vegetable oils.¹⁶¹

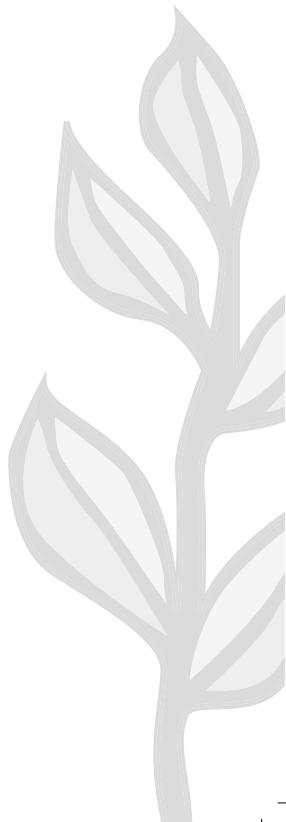
The feedstock requirements of the recently licensed Rainbow Nation plant at Coega, which is just one of South Africa's planned biodiesel plants, is 1 360 000 tons of soya at full production. This demand will completely overwhelm current local production requiring sustained imports and creating a local shortfall that is likely to impact on other oils, putting pressure on vegetable oil prices generally. Although the high prices have motivated South African farmers to dramatically increase the area planted to sunflowers in 2008 by almost 80% to 564 300 ha,¹⁶² the Department of Agriculture noted that some of the decline in sunflower plantings in the 2005/06 season was a result of farmers switching to soya production in anticipation of biofuels sales.¹⁶³ This is likely to add to the average person's cost of living as it has done this year, with knock-on increases in goods like bread, margarine and soap.

The Coega plant will also produce 1 100 000 tons of oilseed cake for animal feed, which will saturate the local market. In the 2006/7 season South Africa imported oilcake to the value of R923 million¹⁶⁴, which translates into approximately 673 000 tons.^{vi} Oilseed cake could possibly be a lucrative export product, given the international price trends; however, the national biofuels feasibility study published in 2006 cautioned against increasing biodiesel penetration beyond 2% of national fuel supply because the animal feed industry has limited capacity to absorb an increase in the supply of oilcake.¹⁶⁵ Sunflower oilcake is a particular problem as its

^{vi} Calculated as follows: The FAO average price for oilcake was \$196/ton during 2006/7 (<http://www.fao.org/docrep/010/ai466e/ai466e14.htm>). South African import value of R923 million converted to \$131.86 million at an average USD to Rand exchange rate of approximately 1:7

inclusion in pig and poultry feeds is restricted by the oilcake's high fibre content. The DoA notes that "because of this constraint, the demand for oilcake plays an important role in determining the demand for sunflower seed."¹⁶⁶

With biodiesel there is always an opportunity to divert vegetable oils to whichever market is the most lucrative. Continental Oil Mills (Pty) Ltd commissioned a new R220 million crusher in April 2008. This second crushing facility in Randfontein has increased their capacity to 36 500 tons per month to become the largest single crusher and refiner of edible oil seed in the country. South Africa's overall crushing capacity is now over 90 000 tons a month. Managing Director Mohammed Ferouze Moosa sums up the free market response, "The world's population is growing; demand for food and for bio-diesel is always going to increase."¹⁶⁷



conclusion



The logic of the Biofuels Strategy to introduce large-scale, mono-crop agriculture into the former homelands especially, and other areas of the country, will perpetuate the model of production and consumption of an industrial civilisation that has led to inequality in the world, wars, poverty, and environmental destruction. The industrialisation of agriculture by its very nature, results in displacing rural peoples and traditional farmers from the countryside as it embodies an agricultural system without farmers. This model has far-reaching implications for the whole of society. It implies dispossession of communities of their land and the plunder of their territories, concentration and privatisation of land and water sources, erosion of biodiversity, destruction of natural ecosystems, and the violence and militarisation required to force control over natural resources.

This process of marginalisation of communities that begins in the countryside is the cause of accelerated urbanisation and will undoubtedly exacerbate the crisis in energy supply, housing, health and other basic services, jobs and access to food in the cities. Urban poverty breeds violence, conflicts and the societal malaise that typifies the cities across the global South.

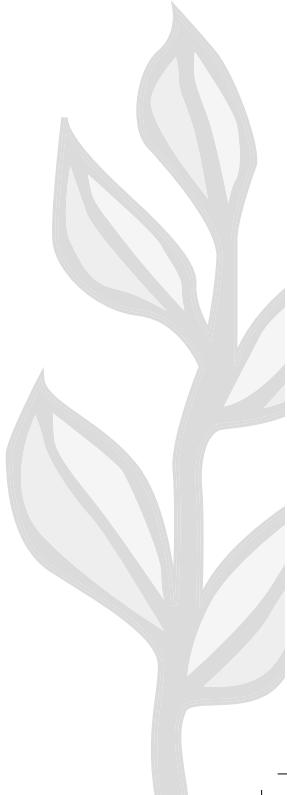
This pressure on land will be deepened as a result of the mantra that agrofuels will be grown on so-called “marginal lands” or “under-utilised land”. These lands are amongst those that has been left out of the agro-industrial scheme and feed most of the poor populations who live in non-commercial cultures.

There is an urgent need for information and public debate at the local and national levels about the implications of the agrofuels push. Indeed, South Africans have the right to transparency and accountability from government. Much work has to be done to advance a campaign for African alternatives to industrial agriculture. These alternatives must be rooted in local agro-ecosystems and local struggles for food sovereignty. Farmer to farmer learning and research, grassroots information campaigns, and policies that support agro-biodiversity and the rights of pastoralists, women farmers, and all small farmers are important pillars of such a campaign.

Strengthening of the social movements, especially the farmers’, pastoralists’, rural women’s and youth organisations is needed to mobilise the majority of

people, to put pressure on the political leaders to change policies and to stop the attempts from multinational companies to take over and industrialise agriculture. The eradication of hunger and poverty, putting the brakes on climate change, conserving natural resources will not be possible without strong and democratic social movements.

In many parts of Latin America and Asia, farmers working within the framework of food sovereignty have developed genuinely sustainable agricultural production methods that contribute towards the eradication of localised poverty. New methods on how to increase yields, protect soils, conserve water and enhance agro-biodiversity while ensuring that economic, social and ecological benefits are distributed equitably, have given new hope to such farmers. Rather than promoting an outdated and tragically flawed agricultural development model, South Africans are urged to look at these and their own resource base and skills to lead a more sustainable social, economic and development revolution.



References

- 1 Statement by MST (Movimento dos Trabhadores Rurais Sem Terra), Via Campesina, www.mst.org.br
- 2 Food and Agriculture Organisation of the United Nations (FAO). 3-5 June 2008, Rome. High-Level Conference on World Food Security: The Challenges of Climate Change and Bioenergy. **Bioenergy, food security and sustainability – towards an international framework.**
- 3 South African government information service. 18 May 2007. **Accelerated and shared growth initiative for South Africa.** <http://www.info.gov.za/asgis/aagisa.htm#top>
- 4 National Biofuels Task Team. October 2006. **An Investigation into the Feasibility of Establishing a Biofuels Industry in the Republic of South Africa.** Final Report. http://www.dme.gov.za/pdfs/energy/bio_feasible_study.pdf (accessed 12 July 2008).
- 5 Department of Minerals and Energy. November 2007. **Biofuels Industrial Strategy of the Republic of South Africa.** http://www.dme.gov.za/pdfs/energy/biofuels_indus_strat.pdf (accessed 10 July 2007).
- 6 Department of Minerals and Energy. **Criteria for licenses to manufacture biofuels.** <http://www.dme.gov.za/pdfs/energy/biofuels%20licensing%20criteria.pdf> (accessed 10 October 2008).
- 7 Department of Minerals and Energy. November 2007. **Biofuels Industrial Strategy of the Republic of South Africa.** http://www.dme.gov.za/pdfs/energy/biofuels_indus_strat.pdf (accessed 10 July 2007).
- 8 McLoughlin, M. 15 October 2008. Excise division, South African Revenue Service head office. Personal communication.
- 9 Parliamentary Monitoring Group. 19 March 2008. Meeting report: **SAPIA Viewpoint of Bio-fuels Industry Strategy.** <http://www.pmg.org.za/report/20080319-sapia-biofuels-industry-strategy> (accessed 27 September 2008).
- 10 Tongaat Hulett. <http://www.huletts.co.za/au/introduction.asp> (accessed 1 October 2008).
- 11 Somdyala, S. 31 July 2008. Chief Executive of AsgiSA Eastern Cape. Personal communication.
- 12 Khumalo, L. 9 March 2007. **Biofuels to power Eastern Cape.** SouthAfrica.info. <http://www.southafrica.info/business/investing/opportunities/biofuels-080307.htm> (accessed 20 July 2008).
- 13 African Centre for Biosafety. 2007. **Monsanto's 'seeds of hope' campaign in South Africa.** http://www.biosafetyafrica.net/portal/images/ACB/files/ACB_SOH.pdf (accessed 20 October 2008).
- 14 National Biofuels Task Team. October 2006. **An Investigation into the Feasibility of Establishing a Biofuels Industry in the Republic of South Africa.** Final Report. http://www.dme.gov.za/pdfs/energy/bio_feasible_study.pdf (accessed 12 July 2008).
- 15 Department of Minerals and Energy. November 2006. **Draft Biofuels Industrial Strategy of the Republic of South Africa.**
- 16 South African government information service. 18 May 2007. **Accelerated and Shared Growth Initiative for South Africa.** <http://www.info.gov.za/asgis/aagisa.htm#top> (accessed 9 July 2008).
- 17 Department of Minerals and Energy. November 2006. **Draft Biofuels Industrial Strategy of the Republic of South Africa.**
- 18 United Nations – Energy. 2007. **Sustainable Bioenergy, a framework for decision makers.** <http://esa.un.org/un-energy/pdf/susdev.Biofuels.FAO.pdf> (accessed 18 October 2008).
- 19 CEF. <http://www.cef.org.za/content/view/66/37/> (accessed 20 October 2008).
- 20 Van Niekerk, W. 10 August 2006. **University signs agreement with the South African National Energy Research.** Stellenbosch University News. http://www.sun.ac.za/News/Newsitem_Eng.asp?ItemID=10685&Zone=AEX (accessed 20 October 2008).
- 21 Solgado, I. 16 March 2007. **Ethanol Africa gets \$110m injection for first plant.** Business Report. <http://www.busrep.co.za/index.php?fSectionId=&fArticleId=3733546> (accessed 15 July 2008).
- 22 CURES (Citizens United for Renewable energy and sustainability) South African Network. March 2007. **Declaration on Bioenergy.**
- 23 Statement emanating from civil society workshop in Durban to discuss the draft Biofuels Industrial Strategy. March 2007. **Rural communities express dismay: "land grabs" fuelled by biofuels strategy.** <http://www>.

- biosafetyafrica.net/portal/images//ruralcommunitiesexpressdismay.pdf (accessed 8 August 2008).
- 24 COSATU. 10 March 2007. **Submission on the draft Biofuels Industrial Strategy.** <http://www.cosatu.org.za/docs/2007/biofu.pdf> (accessed 8 August 2008).
- 25 Taylor, J. 23 June 2007. **How the rising price of corn made Mexicans take to the streets.** The Independent. <http://www.independent.co.za/world/americas/How-the-rising-price-of-corn-made-Mexicans-take-to-the-streets-454260-html> (accessed 8 August 2008).
- 26 Pressly, D. 5 August 2007. **Use cane, not maize, for fuel – Mbaweni.** Business Report. <http://www.busrep.co.za/index.php?fArticleId=3967131> (accessed 8 August 2008).
- 27 Coetzee, K. 18 April 2007. **South African bioethanol: pipe dream or viable proposition?** Farmers Weekly.
- 28 SABINET online. SA Gazettes Index for week of 4th August 2006. <http://www.sabinet.co.za/sabinetlaw/gazindex/20060804.html> (accessed 27 September 2008).
- 29 The SA Institute of Chartered Accountants. April 2005. The Department of Trade and Industry Strategic Industrial Projects Programme: Guidance for auditors. https://www.saica.co.za/documents/Strategic_Industrial_Programme_Guidance_for_Auditors.pdf (accessed 28 September 2008).
- 30 Solgado, I. 24 February 2006. **Free State to get first bio-ethanol plant.** Business Report. <http://www.busrep.co.za/index.php?fArticleId=3128837> (accessed 15th July 2008).
- 31 27 March 2007. **Ethanol Africa gets R825 million injection.** Farmers Weekly.
- 32 Solgado, I. 16 March 2007. Ethanol Africa gets \$110m injection for first plant. Business report. <http://www.busrep.co.za/index.php?fSectionId=&fArticleId=3733546> (accessed 15th July 2008).
- 33 27 February 2007. **Co-ops nervously eye Ethanol Africa.** Farmers Weekly.
- 34 Solgado, I. 20 February 2007. **Steel price inflates cost of first local bioethanol plant.** February 20, 2007. Business Report. <http://www.busrep.co.za/index.php?fSectionId=561&fArticleId=3690831>. (accessed 27 September 2008).
- 35 Mouton, H. 28 July 2008. Ethanol Africa. Personal communication.
- 36 Njobeni, S. 19 September 2008. **South Africa Ethanol project runs out of steam.** Business Day. <http://allafrica.com/stories/200809190722.html> (accessed 28 September 2008).
- 37 Van der Merwe, C. 14 December 2007. **Omnia calls for re-examination of biofuels strategy.** Engineering News. http://www.engineeringnews.co.za/article.php?a_id=123694 (accessed 8 September 2008).
- 38 Van der Merwe, C. 7 May 2008. **GrainSA wants open discussion on biofuels policy.** Engineering News. http://www.engineeringnews.co.za/article.php?a_id=132792 (accessed 28 September 2008).
- 39 Department of Minerals and Energy. November 2007. **Biofuels Industrial Strategy of the Republic of South Africa.** http://www.dme.gov.za/pdfs/energy/biofuels_indus_strat.pdf (accessed 10 July 2007).
- 40 Government Gazette. 27 March 2006. **Regulations regarding petroleum manufacturing licenses under sections 2A, 2C, 2E, 2F and 12C of the Petroleum Products Act, 1977 (Act No. 120 of 1977).**
- 41 Department of Minerals and Energy. **Criteria for licenses to manufacture biofuels.** <http://www.dme.gov.za/pdfs/energy/biofuels%20licensing%20criteria.pdf> (accessed 10 October 2008).
- 42 Collins, S. 31 July 2008. Director, J&J Bioenergy. Personal communication.
- 43 Department of Minerals and Energy. **Criteria for licenses to manufacture biofuels.** <http://www.dme.gov.za/pdfs/energy/biofuels%20licensing%20criteria.pdf> (accessed 10 October 2008).
- 44 Government Gazette. 27 March 2006. **Regulations regarding petroleum manufacturing licenses under sections 2A, 2C, 2E, 2F and 12C of the Petroleum Products Act, 1977 (Act No. 120 of 1977).**
- 45 Mtwa, X. 29 July 2008. Department of Minerals and Energy: Renewable energy. Personal communication.
- 46 Rainbow Nation Renewable Fuels. 22 September 2008. **Media announcement: SA government issues historic license.** <http://www.natbiogroup.com/default.asp?id=47>. (accessed 1 October 2008).
- 47 South African Revenue Service. <http://www.sars.gov.za/home.asp?pid=503#What%20is%20fuel%20levy> (accessed 15 October 2008).
- 48 Department of Minerals and Energy. November 2007. **Biofuels Industrial Strategy of the Republic of South Africa.** http://www.dme.gov.za/pdfs/energy/biofuels_indus_strat.pdf (accessed 10 July 2007).
- 49 McLoughlin, M. 15 October 2008. Excise division, South African Revenue Service head office. Personal communication.

54 BIOSAFETY, BIOPIRACY AND BIOPOLITICS SERIES

- 50 Calculated from 'Year to date' figures for January – September 2008 published by the South African Petroleum Industry Association. **Sales of major petroleum products in South Africa.** <http://www.sapia.co.za/stats/demand.htm> (accessed 27 September 2008).
- 51 Department of Minerals and Energy. <http://www.dme.gov.za/energy/liquid.stm> (accessed 1 October 2008).
- 52 South African Petroleum Industry Association. **Sales of major petroleum products in South Africa.** <http://www.sapia.co.za/stats/demand.htm> (accessed 27 September 2008).
- 53 Parliamentary Monitoring Group. 19 March 2008. Meeting report: **SAPIA Viewpoint of Bio-fuels Industry Strategy.** <http://www.pmg.org.za/report/20080319-sapia-biofuels-industry-strategy> (accessed 2 October 2008).
- 54 Summarised from personal communication with Molden, A. 15 October 2008. Biodiesel expert. South African Petroleum Industry Association and the meeting report: **SAPIA Viewpoint of Bio-fuels Industry Strategy.** <http://www.pmg.org.za/report/20080319-sapia-biofuels-industry-strategy> (accessed 2 October 2008).
- 55 Wikipedia. Ethanol fuel. http://en.wikipedia.org/wiki/Ethanol_fuel (accessed 1 October 2008).
- 56 Parliamentary Monitoring Group. 19 March 2008. Meeting report: **SAPIA Viewpoint of Biofuels Industry Strategy.** <http://www.pmg.org.za/report/20080319-sapia-biofuels-industry-strategy>
- 57 Molden, A. 15 October 2008. Biodiesel expert. South African Petroleum Industry Association. Personal communication.
- 58 Biodiesel SA. <http://www.bioidieselsa.co.za/what.htm> (accessed 1 October 2008).
- 59 Parliamentary Monitoring Group. 19 March 2008. Meeting report: **SAPIA viewpoint of biofuels industry Strategy.** <http://www.pmg.org.za/report/20080319-sapia-biofuels-industry-strategy>
- 60 Department of Minerals and Energy. November 2007. **Biofuels Industrial Strategy of the Republic of South Africa.** Pages 24– 25. http://www.dme.gov.za/pdfs/energy/biofuels_indus_strat.pdf (accessed 10 July 2007).
- 61 IDC. 2006. **News and Media releases.** <http://www.idc.co.za/IDC%20News%20and%20Media%20releases.asp?GroupCode=0&frmYear=2006> (accessed 27 September 2008).
- 62 Byrnes, R.M. ed. 1996. **South Africa: A Country Study.** Washington: GPO for the Library of Congress. <http://countrystudies.us/south-africa/63.htm> (accessed 20 November 2008).
- 63 Industrial Development Corporation. <http://www.idc.co.za/IDC%20Fact%20sheet.asp> (accessed 20 October 2008).
- 64 Craven, P. 17 November 2008. **COSATU concerned at Luhabe allegations.** COSATU media release. http://groups.google.com/group/COSATU-press/browse_thread/thread/b27c3c9748303533 (accessed 20 November 2008).
- 65 Central Energy Fund. <http://www.cef.org.za/content/view/3/10/> (accessed 20 October 2008).
- 66 Central Energy Fund. See <http://www.cef.org.za/content/view/13/22/> (accessed 20 October 2008).
- 67 Ngubane, S. 1 August 2008. Commercial manager. Central Energy Fund. Personal communication.
- 68 South African government information service. 18 May 2007. **Accelerated and shared growth initiative for South Africa.** <http://www.info.gov.za/asgisa/asgisa.htm#top>
- 69 Overview of biofuel project in the East London IDZ, received from Ntombana, M. Sector Specialist: Automotive & Biofuels at ELIDZ on 28 July 2008.
- 70 PhytoEnergy Group. 20 September 2008. <http://phytoenergy.org/news.html> (accessed 1 October 2008).
- 71 Somdyala, S. 31 July 2008. Chief Executive of AsgiSA Eastern Cape. Personal communication.
- 72 Overview of biofuel project in the East London IDZ, received from Ntombana, M. Sector Specialist: Automotive & Biofuels at ELIDZ on 28 July 2008.
- 73 National Biofuels Group. <http://www.natbiogroup.com/default.asp?id=1> (accessed 1 October 2008).
- 74 Department of Agriculture, South Africa. 2007. Trends in the agricultural sector 2006. http://www.nda.agric.za/docs/Trends_2006.pdf (accessed 1 October 2008).
- 75 Mordt, G. 30 July 2008. Managing Director, Rainbow Nation Renewable Fuels. Personal communication.
- 76 Farmers Weekly. 12 June 2007. **Biofuels sweetener for sugar beet pioneers.** [http://www.farmersweekly.co.za/index.php?p\[!Gcms_nodes\]\[!Gcms_nodesUID\]=6a32c6792737dfd6cff3a8edad3beb68](http://www.farmersweekly.co.za/index.php?p[!Gcms_nodes][!Gcms_nodesUID]=6a32c6792737dfd6cff3a8edad3beb68) (accessed 18 July 2008).
- 77 Sugar Beet SA. **About us.** <http://www.sugarbeetsa.co.za/aboutus.html> (accessed 1 October 2008).

- 78 AGES (Pty) Ltd. September 2008. **Scoping Report as part of the Environmental Impact Assessment for the Proposed Cradock Ethanol Plant.**
- 79 Ngubane, S. 1 August 2008. Commercial manager. Central Energy Fund. Personal communication.
- 80 Du Toit, J. 15 May 2008. **Sugarbeet: Saviour or downfall of Cradock?** Cradock Courant.
- 81 AGES (Pty) Ltd. September 2008. **Scoping Report as part of the Environmental Impact Assessment for the proposed Cradock ethanol plant.**
- 82 Ngubane, S. 1 August 2008. Commercial manager. Central Energy Fund. Personal communication.
- 83 Somdyala, S. 31 July 2008. Chief Executive of AsgiSA Eastern Cape. Personal communication.
- 84 Collins, S. 31 July 2008. Director, J&J Bioenergy. Personal communication.
- 85 Ngubane, S. 1 August 2008. Commercial manager. Central Energy Fund. Personal communication.
- 86 Patel, SS. 11 August 2008. Environmental analyst, Eastern Region. DBSA. Personal communication.
- 87 Kruger Times. <http://www.krugertimes.com/econews/ethanolplant.htm>. (accessed 26 July 2008).
- 88 Ngubane, S. 1 August 2008. Commercial manager. Central Energy Fund. Personal communication.
- 89 Kruger Times. **100 million litre a year ethanol plant in the pipeline for Hoedspruit...will the Blyde dam wall be raised?** <http://www.krugertimes.com/econews/ethanolplant.htm>. (accessed 26 July 2008).
- 90 Siphugu, C. March 2008. **Incubation of small scale farmers for biodiesel.** Presentation to CURES biofuels capacity building workshop. <http://cures.org.za/rempository?func=startdown&id=11&82d1aa62d457f26c83dfd0a1b4a88344=66000e72b7bf3fb53bdd016491652f21> (accessed 3 October 2008).
- 91 Siphugu, C. 1 August 2008. Business Development Manager. Mapfura-Makhura Incubator. Personal communication.
- 92 Siphugu, C. 1 August 2008. Business Development Manager. Mapfura-Makhura Incubator. Personal communication.
- 93 www.inw.org.za/LinkClick.aspx?link=BAROLONG%20B0.doc
- 94 Mmope, N. 25 May 2007. **North West seeks action on Mafikeng biodiesel plan.** Business Report. <http://www.busrep.co.za/index.php?fSectionId=561&fArticleId=385014> (accessed 1 August 2008).
- 95 Le Roux, H. 22 June 2006. **Growing diesel.** Engineering News. http://www.engineeringnews.co.za/print_version.php?a_id=110466 (accessed 1 August 2008).
- 96 Mmope, N. 11 March 2007. **R850m biodiesel undertaking put on hold.** Business Report. <http://www.busrep.co.za/index.php?fSectionId=561&fArticleId=3722883> (accessed 1 August 2008).
- 97 Mvulane, Z. 1 August 2008. Representative Invest North West. Personal communication.
- 98 Enslin, S. 29 May 2005. **Plans to bring biodiesel to SA gain traction.** <http://www.busrep.co.za/index.php?fSectionId=&fArticleId=2537729> (accessed 1 August 2008).
- 99 25 Degrees in Africa. August 2006. **The Jatropha arguments: Is Jatropha Curcus everything it promises to be?** Volume 1, Journal 1.
- 100 South African government information service. <http://www.info.gov.za/issues/govtprog/escape.htm#massive> (accessed 1 October 2008)
- 101 Wells, M. 10 August 2008. Eastern Cape farmer and community development specialist. Personal communication.
- 102 Department of Agriculture, Eastern Cape Provincial Government. 26 August 2008. **Mlambo-Ngcuka impressed by Eastern Cape agricultural projects.** <http://www.info.gov.za/speeches/2008/08082614451001.htm> (accessed 1 October 2008).
- 103 The Rockefeller Foundation. July 2006. **Africa's turn: a new green revolution for the 21st Century.** http://www.rockfound.org/Library/africas_turn.pdf
- 104 Dano, E.C. 2007. **Unmasking the New Green Revolution in Africa: motives, players and dynamics.** http://www.biosafetyafrica.net/portal/index.php?option=com_content&task=category§ionid=12&id=53&Itemid=73 (accessed 20 October 2008).
- 105 Nkwinti, G. 11 March 2008. 2008 Policy Speech, Eastern Cape Department of Agriculture. <http://www.info.gov.za/speeches/2008/08032613451001.htm> (accessed 20 July 2008).
- 106 African Centre for Biosafety. 2007. **Monsanto's 'seeds of hope' campaign in South Africa.** http://www.biosafetyafrica.net/portal/images/ACB/files/ACB_SOH.pdf (accessed 20 October 2008).

56 BIOSAFETY, BIOPIRACY AND BIOPOLITICS SERIES

- 107 Nkwinti, G. 11 March 2008. 2008 Policy Speech, Eastern Cape Department of Agriculture. <http://www.info.gov.za/speeches/2008/08032613451001.htm> (accessed 20 July 2008).
- 108 GRAIN. October 2008. **Lessons from a Green Revolution in South Africa**. Article in Seedling. <http://www.grain.org/seedling/?id=568> (accessed 19 November 2008).
- 109 Somdyala, S. 31 July 2008. Chief Executive of AsgiSA Eastern Cape. Personal communication.
- 110 Khumalo, L. 9 March 2007. **Biofuels to power Eastern Cape**. SouthAfrica.info. <http://www.southafrica.info/business/investing/opportunities/biofuels-080307.htm> (accessed 20 July 2008).
- 111 Nkwinti, G. 11 March 2008. 2008 Policy Speech, Eastern Cape Department of Agriculture. <http://www.info.gov.za/speeches/2008/08032613451001.htm> (accessed 20 July 2008).
- 112 Booij, M and Van Zyl, R. 15 May 2007. Dispatch. <http://www.dispatch.co.za/2007/05/15/Easterncape/asgisa.html> (accessed 29 July 2008).
- 113 AsgiSA. 2007 Annual report. <http://www.info.gov.za/view/DownloadFileAction?id=80162> (accessed 29 July 2008).
- 114 SouthAfrica.info. 1 June 2007. **R60bn investment plan for E Cape**. <http://www.southafrica.info/business/investing/opportunities/asgi-ec-250507.htm> (accessed 20 July 2008).
- 115 Somdyala, S. 31 July 2008. Chief Executive of AsgiSA Eastern Cape. Personal communication.
- 116 Khumalo, L. 9 March 2007. **Biofuels to power Eastern Cape**. SouthAfrica.info. <http://www.southafrica.info/business/investing/opportunities/biofuels-080307.htm> (accessed 20 July 2008).
- 117 Nkwinti, G. 11 March 2008. 2008 Policy Speech, Eastern Cape Department of Agriculture. <http://www.info.gov.za/speeches/2008/08032613451001.htm> (accessed 20 July 2008).
- 118 Wynne, A. 1 August 2008. Technical liaison manager, South African Cane Growers Association. Personal communication.
- 119 Davie, K. 7 April 2006. Big sugar, sweet life. The Mail & Guardian. <http://www.mg.co.za/article/2006-04-07-big-sugar-sweet-life> (accessed 26 July 2008).
- 120 Wynne, A. 1 August 2008. Technical liaison manager, South African Cane Growers Association. Personal communication.
- 121 Kavanagh, K. 25 July 2008. National Sales Manager. Illovo Sugar. Personal communication.
- 122 Cornish, B. 6 August 2008. Operations manager, Merebank Illovo Sugar. Personal communication.
- 123 Kavanagh, K. 25 July 2008. National Sales Manager. Illovo Sugar. Personal communication.
- 124 Resource Energy. <http://www.resourceenergy.net/gfocus.html> (accessed 1 October 2008).
- 125 Khanyile, S. 15 August 2007. **Tsb Sugar scouts partners to sell empowerment stake**. <http://www.busrep.co.za/index.php?fSectionId=&fArticleId=3983632> (accessed 1 October 2008).
- 126 Royal Swazi Sugar Corporation. http://www.rssc.co.sz/group_profile.htm (accessed 1 October 2008).
- 127 Booker Tate website. http://www.bookertate.co.uk/Strategic_sectors/Ethanol.aspx (accessed 1 October 2008).
- 128 Davidson, G. 30 July 2008. Sales manager. NCP Alcohols. Personal communication.
- 129 Tongaat Hulett. 31 January 2008. **Press releases: Co-generation of electricity**. http://www.tongaat.co.za/imc/press/press_display.asp?yr=2008&press=69 (accessed 1 October 2008).
- 130 Business Report. 6 June 2008. **Biofuel plan will be African success**. <http://www.busrep.co.za/index.php?fSectionId=563&fArticleId=4440503> (accessed 21 July 2008).
- 131 Tongaat Hulett. 31 July 2008. **Commentary on the Interim Results for the half-year ended 30 June 2008**. http://www.tongaat.co.za/imc/earn_releases/june_2008/default.asp?page=comments.htm
- 132 http://www.tongaat.co.za/imc/presentations/aug_01_07/pdf/aug_01_07.pdf
- 133 Tongaat Hulett. Presentation half-year 2008. http://www.tongaat.co.za/imc/presentations/aug_08/aug_08.asp (accessed 1 October 2008).
- 134 Tongaat Hulett. <http://www.huletts.co.za/au/introduction.asp> (accessed 1 October 2008).
- 135 Tongaat Hulett. **Presentation half-year 2008**. http://www.tongaat.co.za/imc/presentations/aug_08/aug_08.asp (accessed 1 October 2008).
- 136 Tongaat Hulett. <http://www.huletts.co.za/au/introduction.asp> (accessed 1 October 2008).
- 137 Wynne, A. 1 August 2008. Technical liaison manager, South African Cane Growers Association. Personal communication.

- 138 Lynsky, R. 30 September 2008. Natural Resources Manager. South African Sugar Association. Personal communication.
- 139 Statistics SA. August 2008. Monthly food prices presented by SA Grain Information Service. <http://www.sagis.org.za/> (accessed 1 October 2008).
- 140 Ngubane, S. 1 August 2008. Commercial manager. Central Energy Fund. Personal communication.
- 141 Business Report. 6 November 2006. **Louis Dreyfuss launches new veg oil trading unit.** <http://www.busrep.co.za/index.php?fArticleId=3523269> (accessed 21 July 2008).
- 142 Van Heerden, M. 29 July 2008. Louis Dreyfus Durban office. Personal communication.
- 143 Eastern Cape Development Corporation. Livestock. <http://www.ecdc.co.za/livestock> (accessed 20 October 2008).
- 144 Department of Minerals and Energy. November 2007. **Biofuels Industrial Strategy of the Republic of South Africa.** http://www.dme.gov.za/pdfs/energy/biofuels_indus_strat.pdf (accessed 10 July 2007).
- 145 Shackleton, S., Shackleton, C., and Cousins, B. November 2000. **Re-valuing the communal lands of southern Africa: new understandings of rural livelihoods**, PLAAS. ODI, Natural Resource Perspectives No. 62, November 2000. <http://tinyurl.com/3eu5ot> (accessed 20 November 2008).
- 146 GRAIN. October 2008. **Lessons from a Green Revolution in South Africa.** Article in Seedling. <http://www.grain.org/seedling/?id=568> (accessed 19 November 2008).
- 147 The mechanisms used and negative consequences have been well documented in Witt, H., Patel, R., and Schnurr, M. 2006. **Can the poor help GM crops? Technology, representation and cotton in the Makathini Flats, South Africa.** Review of African Political Economy. No. 109.
- 148 African Centre for Biosafety. 2007. **Monsanto's 'seeds of hope' campaign in South Africa.** http://www.biosafetyafrica.net/portal/images/ACB/files/ACB_SOH.pdf (accessed 20 October 2008).
- 149 GRAIN. October 2008. **Lessons from a Green Revolution in South Africa.** Article in Seedling. <http://www.grain.org/seedling/?id=568> (accessed 19 November 2008).
- 150 Cox, C. 2004. **Glyphosate factsheet. Journal of Pesticide Reform.** Winter 2004. Vol. 24, No. 4
- 151 Ho, M.W. 2004. **How Europe is re-colonising America with help from the natives.** Institute of Science in Society press release 21/11/04. <http://www.i-sis.org.uk/HEIRA.php> (accessed 20 October 2008).
- 152 Monsanto Company. 3 November 2008. **Monsanto Company to invest in technologies for sugarcane with acquisitions of Canavialis and Alelyx.** <http://monsanto.mediaroom.com/index.php?s=43&item=656> (accessed 20 November 2008).
- 153 National Department of Agriculture. August 2008. **Monthly food security bulletin.** <http://www.nda.agric.za/docs/Cropsestimates/RSA%20Food%20Security%20Bulletin%20Aug%202008.pdf> (accessed 3 October 2008).
- 154 National Department of Agriculture. August 2008. **Monthly food security bulletin.** <http://www.nda.agric.za/docs/Cropsestimates/RSA%20Food%20Security%20Bulletin%20Aug%202008.pdf> (accessed 3 October 2008).
- 155 Food and Agriculture Organisation of the UN. June 2008. **Food outlook: oilseeds, oils and meals.** <http://www.fao.org/docrep/010/ai466e/ai466e06.htm> (accessed 3 October 2008).
- 156 The Baker. **Oil rush.** Vol 11 Number 8. http://www.thebaker.co.za/ad_vol11no8oils.html (accessed 3 October 2008).
- 157 National Department of Agriculture. 2007. **Trends in the agricultural sector: 2007.** <http://www.nda.agric.za/> (accessed 3 October 2008).
- 158 The Baker. **Oil rush.** Vol 11 Number 8. http://www.thebaker.co.za/ad_vol11no8oils.html (accessed 3 October 2008).
- 159 Bizcommunity.com. 14 February 2008. **Food manufacturers call for drop in import duties.** <http://www.bizcommunity.com:80/Print.aspx?l=196&c=174&ct=1&ci=21963>
- 160 Food and Agriculture Organisation of the UN. June 2008. **GIEWS Food outlook: global market analysis.** <ftp://ftp.fao.org/docrep/fao/010/ai466e/ai466e00.pdf> (accessed 1 October 2008).
- 161 FAO 29 May 2008. **Agricultural commodity prices expected to remain high.** <http://www.fao.org/Newsroom/en/news/2008/1000849/index.html> (accessed 3 October 2008).
- 162 National Department of Agriculture. August 2008. **Monthly food security bulletin.** <http://www.nda.agric.za/docs/Cropsestimates/RSA%20Food%20Security%20Bulletin%20Aug%202008.pdf> (accessed 3 October 2008).

58 BIOSAFETY, BIOPIRACY AND BIOPOLITICS SERIES

- 163 National Department of Agriculture. 2007. **Trends in the agricultural sector: 2006**. <http://www.nda.agric.za/> (accessed 3 October 2008).
- 164 National Department of Agriculture. 2007. **Economic review of South African agriculture: 2007/8**. <http://www.nda.agric.za/> (accessed 3 October 2008).
- 165 National biofuels task team. October 2006. **An investigation into the feasibility of establishing a biofuels industry in the republic of South Africa**.
- 166 National Department of Agriculture. 2007. Trends in the agricultural sector: 2006. <http://www.nda.agric.za/> (accessed 3 October 2008).
- 167 Media release by Continental Oil Mills. http://lnw.creamermedia.co.za/articles/attachments/12455_oil.pdf (accessed 27 September 2008).