Introduction

Brazil today stands as one of the great development successes of the twentieth century. The country has greatly reduced its burden of poverty and hunger; it successfully transitioned from dictatorship to a vibrant democracy; and it has moved from a marginal role as a ‘sleeping giant’ to an increasingly assertive position in international affairs of the twenty-first century. Brazil has many lingering social problems, among the greatest being persistently high levels of inequality, but in its new position as a global leader and aspirant to greater power, the country has begun to turn its attention outward and take an active interest in other countries’ development.

One of the main drivers of Brazil’s twentieth-century development process was its advances in agricultural production, which drove economic growth while also helping to alleviate hunger in its rapidly expanding cities (though often at the cost of the food and land sovereignty of the rural population). As Brazil has increased its involvement abroad, agriculture has become a pillar of its development assistance programmes and foreign direct investment and is seen as one of Brazil’s particular strengths as it seeks to cultivate stronger relationships with other countries in the global South, particularly in Africa.

Food insecurity in Africa remains a constant concern for the continent’s governments and the international community. Many of the developing countries of Asia and Latin America greatly expanded agricultural production during the green revolution of the 1960s and 1970s, but the impacts of this shift in agricultural technologies and practices failed to take hold in Africa, leaving observers wondering when and how Africa should best achieve its own green revolution (see Diao et al. 2008; Gowing and Palmer 2008). Brazil’s experience in greatly increasing its own agricultural production has granted it expertise that may be useful in helping African countries to meet their food needs.

Brazilian agricultural assistance and investments have not been limited to food production, however. Brazil has long been a global leader in the production and usage of biofuels – combustible liquid fuels produced from agricultural crops or crop waste. Biofuels have grown in prominence over the past
two decades as they have been presented as one potential option for meeting global energy needs while reducing greenhouse gas emissions. However, serious concerns remain about the balance of costs and benefits provided by the production of biofuel from different feedstocks, including the effect of biofuel feedstock cultivation on food security (see Chapter 7).

This chapter, therefore, explores the role of agriculture in Brazilian development assistance programmes and direct investment in Africa, focusing on the potential tensions between biofuel feedstock and food production. After a brief overview of the history of Brazil’s own agricultural development and the country’s relations with Africa, the chapter delves into an examination of Brazilian engagement in the conjoined agricultural and energy sectors of Mozambique, a country that possesses large tracts of arable land and is considered a prime site for biofuel production. The chapter critiques Brazil’s development assistance and investment model and presents ways to improve its effectiveness in order to generate greater benefits for the Mozambican people.

**Brazilian agricultural development and relations with Africa**

Both Brazil’s engagement with Africa and the country’s agricultural development have grown by leaps and bounds during the period from the early 1970s to the present day. Throughout the 1960s, as Portugal was waging wars to hold on to its African colonies, Brazil remained deferent to its former colonial master. With the 1974 Carnation Revolution in Portugal that overthrew the Salazar–Caetano dictatorship, Brazil seized the opportunity to rapidly shift its approach, becoming the first country allied with the ‘West’ to recognise Angola’s independence, and quickly recognising the independence of Mozambique, Guinea-Bissau and Cape Verde, an ‘astute strategic manoeuvre’ that has engendered goodwill towards Brazil in these countries up to the present day (White 2010: 224).

In the 1970s and 1980s, Brazilian policy in Africa was focused primarily on securing oil supplies, so diplomatic emphasis was given to relations with Angola and Nigeria. Brazilian development assistance was unheard of at the time, as Brazil remained focused on its own domestic socioeconomic development. Alongside increasing industrialisation, Brazil’s economic policy was based around the expansion of agricultural production to promote growth, combat poverty and increase food security.

**Brazil’s domestic priorities: food and energy security as catalysts for growth achieving food security: priority number one** To achieve increases in agricultural production, Brazil relied on a dual strategy of expansion of the area of land under cultivation and research and technological innovation. Brazil began to expand agriculture into its internal frontiers in the Amazon and the savannah of the cerrado region of the south-east and central western parts of the country, a process also aimed at consolidating state control of...
these regions. To increase production, especially in the acidic cerrado soils, technological innovations were needed. In addition to taking advantage of global advances in fertilisers and mechanisation, Brazil began to ramp up its own agricultural research capacity, which had been extremely low (Graham et al. 1987). National efforts were organised through the founding in 1973 of the Empresa Brasileira de Pesquisa Agropecuária (Embrapa, or the Brazilian Agricultural Research Corporation), which is affiliated to the Ministry of Agriculture, to test and create crop varieties suitable for cultivation in the country’s different climates.

Embrapa’s first major task was increasing agricultural production in the cerrado region, and in this it was highly successful. According to Francisco Reifschneider, an Embrapa researcher: ‘The general impression was that this was wasteland. Today this “wasteland” produces more than 45 per cent of the total grain of this country’ (Akinola 2010). Brazil has now become a net exporter of food, and food insecurity has fallen thanks to reduced income inequality, lower prices due to greater domestic food production, and the efforts of the administration of President Luiz Inácio Lula da Silva (2003–10), the keystone of whose social policy was the multifaceted Fome Zero (Zero Hunger) initiative (see, for example, Neves do Amaral and Peduto 2010). The agriculture and livestock sector grew at an average annual rate of 2 per cent from the 1970s to 2005 (Akinola 2010) and is currently growing at over 6 per cent per year (De Onis 2008: 113), making Brazil today the world’s second-largest agricultural producer, behind only the United States.

**Achieving Energy Security: Priority Number Two**

Beyond food security, Brazil has also used its improved agricultural production to boost its energy security, becoming an international leader in the production of biofuels. Biofuels are liquid fuels produced directly from renewable natural sources (i.e. plant feedstocks or biological waste). In the mid-1970s, in response to the 1973 oil crisis, Brazil began to pursue the production of ethanol from sugar cane to use as a substitute for imported petrol. The choice of using sugar cane was also made in order to support sugar-cane farmers, whose investments in mechanisation and modernisation had been followed by falling sugar prices (see, for example, Hall et al. 2009). Thanks to this early start, Brazil has become an international leader in biofuel production. In fact, Brazil has been exporting its biofuel expertise to Africa for several decades now; as early as the 1970s a Brazilian company had installed its production technology in a methanol plant in Zimbabwe (Forrest 1982: 14).

The benefits of biofuel production for the Brazilian economy have been quite clear, as it has given the country greater energy security and kept more wealth within Brazil. The social and environmental impacts have been less impressive. Sugar cane ethanol production has mainly benefited the wealthier
states in the country, has contributed to land concentration, and has led to the consolidation of the market under the control of a small group of large corporations. Efforts have been made to avoid this outcome as Brazil steps up its production of soya bean and castor seed-based biodiesel, with policies in place to keep more feedstock production in the hands of small-scale farmers. However, stakeholders in the biodiesel industry believe that this strategy will fail, stating that without massive government intervention ‘biodiesel is going to be another [ethanol] with only large-scale producers’ and that ‘the whole social program is not going to work’ (Hall et al. 2009: S83).

These issues remain concerns as Brazil becomes increasingly involved with African countries as a development partner and investor, at the same time as many of these countries are seeking to convert arable land to biofuel feedstocks. Biofuel crops are frequently competing with food crops in Africa, a serious problem in countries struggling with food insecurity. In Mozambique, biofuel production is currently expanding and is seen as holding great potential for economic development, with involvement from the Brazilian government and private sector, but it is also contributing to social and political conflict. The next section examines the rise of biofuels in Mozambique, Brazil’s role, and the implications of biofuel production for food security in the country.

Biofuels, land use and food security in Mozambique

Mozambique has made great strides towards reconstruction in the two decades since it emerged from almost 30 years of war. Yet peace has not significantly changed the country’s status as one of the world’s poorest and most deprived states. Mozambique currently ranks as 184 out of 187 countries in the United Nations Development Programme’s Human Development Index (HDI), and while its overall HDI score has been rising slowly, it has not kept pace with the advances of other countries (UNDP 2011). The country’s child mortality rate is one of the highest in the world at 142 per 1,000 (ibid.). According to the Food and Agriculture Organization (FAO), over one-third of all Mozambicans (38 per cent) are undernourished (FAOSTAT 2011), and the majority of those in poverty suffer from acute malnutrition. One study in 2006 estimated that malnutrition has productivity costs in Mozambique of at least US$185 million annually, or about 6 per cent of the gross domestic product (GDP) at the time (Dista and Vicente 2009).

Poverty and hunger are incendiary political and social issues in Mozambique, as the global community was reminded in September 2010 when riots erupted in the capital of Maputo and the nearby industrial city of Matola in response to government-mandated price increases on staple foods and other necessities, such as water and electricity. In the aftermath of the riots, which occurred against a backdrop of high global commodity prices, many commentators referred to the events as ‘food riots’ and sought to tie them to
food prices on the international market, although food prices in fact remained lower than in 2008, when riots had previously taken place, and the crisis in Mozambique was a result of deeper structural problems that have hobbled the country’s development (see Thaler 2010a for a longer discussion).

The agricultural and fisheries sectors in Mozambique provide employment and subsistence for over 80 per cent of the population (FAOSTAT 2011), with the vast majority of this activity taking place on small family farms. Mozambique’s development strategy, which has frequently been externally determined due to the country’s high level of aid dependence, has been focused mainly on large-scale extractive and industrial projects. These projects have succeeded in boosting Mozambique’s GDP, allowing the country to be presented as a success story by groups such as the World Bank, yet they have done little to uplift the majority of the population, creating a two-tiered development system whereby domestic elites and transnational corporations prosper from the country’s natural resources while the poor masses are accorded secondary attention unless they create a situation, such as the 2010 riots, in which their voices are heard.

Much of Mozambique’s economic growth has occurred in the energy and mining sector, as foreign capital has been used to undertake large-scale exploration and exploitation of the country’s coal, oil, gas and mineral resources to meet the global demand for fossil fuels and metals. The human capital for these types of projects, however, tends to be imported, reducing the potential job creation impact, and projects are often initiated on the condition of tax breaks or exemptions, depriving the state of potential revenues that could be used to fund social programmes. The Mozambican government continues to focus on industrial mega-projects to drive growth, but it has also begun to recognise the need to invest in agriculture as part of its development strategy. The government’s 2010–14 Poverty Reduction Action Plan (Plan d’Action pour la Réduction de la Pauvreté or PARP) makes the improvement of agricultural and fisheries productivity its primary objective, with promoting employment given the next most importance (Republic of Mozambique 2011), a welcome emphasis in the face of the continued growth of extractive industries.

The PARP is consistent in its calls to improve the situation of small-scale, family farmers, through improved access to factors of production and better market access. This supposed focus on small-scale farmers and food crops, however, is belied by the actions of the Mozambican government in advancing its overall agricultural policy. Instead of seeking to improve small-scale agriculture to boost food production, the government has sought foreign investment to capitalise on the global spike in demand for biofuels.

**The development of biofuels in Mozambique** Mozambique is considered to have one of the greatest potentials in the world for the production of biofuels due to the availability of uncultivated or underused land, favourable climate and
low population density (see Nhantumbo and Salomão 2010: 7). According to
government estimates from 2006, only about 10 per cent of Mozambique’s 36
million hectares of potential agricultural land are currently under cultivation;
however, more recent land-zoning exercises have determined that only 7 mil-
lion hectares are ‘available for allocation to land-based economic activities,
including biofuels’ (ibid.: 13) and there are questions as to the accuracy of
the zoning that has been conducted. Mozambique’s population has also been
growing at an increasing rate since 2000, so land use estimates may quickly
become outdated as demand from family farmers increases. Critics are wary
of government statistics on the stock of so-called ‘uncultivated or underused
land’, as quite often it refers to land that is used by the community as com-
mon land or to forest areas that are useful for maintaining the country’s
biodiversity – both flora and fauna.

New zoning efforts are planned, but, in the meantime, Mozambique’s govern-
ment, in concert with foreign investors, has made a strong push to turn the
country into a world leader in biofuel production. The ultimate goal of this
endeavour is clearly to increase foreign investment and exchange; a study by
Mozambique’s national oil company has determined that domestic demand
for biofuels is essentially negligible, due to the small size and unindustrialised
character of the Mozambican economy (Petromoç 2008).

Mozambique began its biofuel initiatives in the mid-2000s, with the 2007
rural development strategy including a specific objective:

to promote the production, consumption, transformation and export of fuels
alternative to conventional ones, namely biofuels produced from crops such
as sugarcane, soybeans, sunflower, ground nuts, and jatropha, among others.
(Republic of Mozambique 2007: 46)8

This initial official catalyst for biofuel development was followed in 2009
by the formulation of an elaborated national ‘Policy and Strategy for Biofuels’
(Republic of Mozambique 2009). The policy was presented as possessing two
primary motivations: i) the promotion and exploitation of agriculturally pro-
duced biofuels to improve energy security and sustainable development (while
reducing greenhouse gas emissions); and ii) responding to a need to reduce the
importation of processed fossil fuels. The policy includes a laudable statement
of principles, which highlights the need for inclusion of small-scale farmers;
for transparency in the development of biofuel projects; for environmental and
social sustainability; and for fiscal sustainability. Special mention is also given
to the necessity of evaluating potential biofuel projects ‘to avoid unacceptable
risks in terms of food security, loss or degradation of habitat or biodiversity,
and other environmental damage’ (ibid.: 16). Surprisingly, though, given the
pessimistic assessment by Petromoç (a semi-government entity dealing with
energy issues) of the potential for a domestic biofuel market in Mozambique,
the strategy emphasises plans for the establishment of a national biofuel market; these plans required the enactment in 2012 of regulations stating that all petrol and diesel should be blended with ethanol and biodiesel respectively, forcing the creation of a market.

More recently, the increased interest in biofuel production in Mozambique in response to European Union (EU) requirements for biofuel use has spurred a further examination of the sustainability of biofuel production in the country. To help meet the sustainability provisions of the EU regulations, the Brazilian government partnered with the EU to create a Sustainable Development of Bioenergy project. Under the auspices of this project, an investigation is currently being carried out by the Brazilian Fundação Getulio Vargas (FGV) into the viability of sustainable, environmentally responsible biofuel production in Mozambique. The study is funded with US$800,000 from Brazilian mining giant Vale (Companhia Vale do Rio Doce) (Agência de Informação de Moçambique 2011), which operates the Moatize coal mine in Mozambique and has been involved in sugar cane ethanol production in Brazil. This Brazilian assistance is imbued with a heavy dose of self-interest – Brazilian ethanol is subject to high EU tariffs, but ethanol produced by Brazilian companies in Mozambique is taxed minimally (Reuters 2010).

Since the initial political and strategic groundwork was laid for biofuel development in Mozambique, dozens of projects have been proposed, although few have come to fruition. The biofuel strategy called for concentration on a few feedstock crops, namely sugar cane and sweet sorghum for ethanol production and jatropha and coconut for the production of biodiesel (Republic of Mozambique 2009: 17), but the vast majority of projects have involved sugar cane and jatropha.

**Sugar cane ethanol** Sugar cane ethanol has been the major biofuel that has entered into production in Mozambique. Sugar production throughout southern Africa has increased sharply in recent years as global ethanol demand has soared, with sugar production and exports nearly quintupling in Mozambique from 2000 to 2008 (F. O. Licht in Richardson 2010: 926). African countries have been attempting to emulate Brazil’s success in sugar cane ethanol production, and to do so have relied greatly on Brazilian expertise and development assistance, their demand coinciding with Brazil’s desire to increase South–South cooperation and leverage its historical and cultural ties to Africa for mutual economic development.

Brazil’s official cooperation with Mozambique in the area of biofuels dates back to 2007, when Mozambique’s President Guebuza signed an accord with Lula, the Brazilian president at the time, to establish technical assistance and exchange programmes and to explore market development, goals that have been reaffirmed and further formalised in subsequent agreements, with Brazil
planning to invest US$6 billion in biofuel development in Mozambique (for example, Katerere 2009). The two countries joined with the European Commission in 2010 to sign an agreement establishing ‘their commitment to work together with the objective of fostering the development of the bioenergy sector, focusing on biofuels and bioelectricity’ (Agência de Informação de Moçambique 2010). Biofuels may even provide a nexus for South–South cooperation among the emerging economic powers, with the director of Mozambique’s Investment Promotion Centre, Mahomed Rafik, suggesting, in light of Mozambique’s free trade agreement with China, that a sugar cane project could emerge in which:

A South African company in partnership with a Mozambican company, and with the raw material being processed by a Brazilian company, may gain access to the Chinese market, because the product will be regarded as Mozambican. (Agência de Informação de Moçambique 2009)

A number of Brazilian corporations have developed plans to produce ethanol in Mozambique, generally through partnerships. Açúcar Guarani, a Brazilian subsidiary of transnational sugar company Tereos, has been involved in projects since buying a 75 per cent stake in Mozambican Companhia de Sena for US$17.5 million in 2007 (Benitez 2007). The Sena mill is capable of processing 1.2 million tons of sugar cane per year, and plans have been developed with the Brazilian national oil corporation, Petrobras, to use molasses from Sena to make ethanol (Caminada and Nielsen 2011). As part of the partnership between Petrobras and Guarani, Petrobras is investing 1.6 billion reais (about US$900 million) to purchase a 45.7 per cent share in Guarani (Tereos Internacional 2010). In August 2011, Petrobras announced plans to build its own ethanol factory in Mozambique for production for the domestic market in response to new Mozambican government requirements for ethanol to be added to all petrol at a 10 per cent level; Petrobras stated that if plans go forward, the factory would be built by Guarani (Macauhub 2011a). Brazil’s sugar industry trade association, União da Indústria de Cana-de-Açúcar, has argued for increased involvement in biofuel development in Mozambique to attempt to replicate Brazil’s success in producing ethanol and integrating it into the economy (UNICA 2011), and in 2009 ETH Bioenergia, a subsidiary of Brazilian construction giant Odebrecht, announced plans to build an ethanol plant in Mozambique, with an anticipated investment of approximately 2 billion reais (US$1.1 billion) (TheBioenergySite News Desk 2011). Brazilian diplomats have also suggested that other corporations, such as oil and biofuel producer Cosan and sugar company Copersucar, may be interested in starting ethanol operations in Mozambique (Reuters 2010).9

_Jatropha biodiesel_ Jatropha is a hardy plant that until recently was used mainly for windbreaks and to avoid erosion, although in Africa its oily seeds have
been used for bioenergy in Mali since the early 1990s (Henning 1996). Jatropha has frequently been touted by biofuel advocates because it is able to grow on marginal, degraded and semi-arid lands where it would be difficult or impossible to cultivate other plants, thus avoiding concerns about displacing food crops. This is perhaps one of the reasons why jatropha has received such emphasis in Mozambique, where President Armando Guebuza has been personally involved in the promotion of jatropha cultivation, as noted in the official biofuel strategy (Republic of Mozambique 2009: 14).

The most successful jatropha project to date was that of Sun Biofuels, a British company, which cultivated jatropha for the production of biodiesel that it planned to export to Europe for airline use. Sun made its first shipments from its fields in the central province of Manica to the German company Lufthansa in mid-2011, and was planning to expand its jatropha production from 3,000 hectares to 11,000 hectares. To achieve this expansion, the company was, according to Manager for Corporate Affairs Sergio Gouveia, seeking to draw in smallholder farmers to disperse jatropha cultivation beyond a plantation model. Gouveia dismissed concerns about impacts on food security by suggesting that farmers could use the income from jatropha production to buy food (TradeMark SA 2011), yet given the instability of food prices that led to the 2008 and 2010 riots, substituting jatropha cultivation for subsistence food production would seem to be a wholly irresponsible choice. However, shortly after its initial shipments, Sun Biofuels collapsed, destroying the livelihoods of farmers in Mozambique and Tanzania who had become dependent on the company (Carrington 2011).

Another major jatropha project was initiated by German company Elaion Africa in Sofala province, with plans to cultivate 1,000 hectares of jatropha. After planting initial test plots, however, the company determined that the soil quality was too low for profitable jatropha production, and instead switched to a forestry project on the land (Nhantumbo and Salomão 2010: 10). This case illustrates a problem that has emerged as research on jatropha has intensified: as expressed by Rob Bailis of the Yale University School of Forestry and Environmental Studies:

> while jatropha can indeed grow on lands with minimal water and poor nutrition, ‘if you plant trees in a marginal area, and all they do is just not die, it doesn’t mean you’re going to get a lot of oil from them’. (Luoma 2009)

In order to be produced profitably, jatropha needs significant rainfall or irrigation, for it requires more water than any other biofuel feedstock crop (Gerbens-Leenes et al. 2009). It is possible that climate change in the coming decades will see increased rainfall in Mozambique, which could help alleviate this problem, but climate change models remain highly variable and uncertain (see Tadross 2009).
While most jatropha investors have been European, this sector has also felt Brazil's influence. The overall growth in biofuel production and policy development in Mozambique has been seen by some as galvanised by the interest and engagement of Lula, and Mozambican government plans for jatropha biodiesel production were modelled on a Brazilian system of smallholder cultivation of feedstocks to be sold to biodiesel companies, ‘thereby increas[ing] rural incomes’ (Justiça Ambiental and União Nacional de Camponeses 2009: 9). The Portuguese and Mozambican-owned Moçamgalp biodiesel project has also used Brazilian seeds for its jatropha plantation in Chimoio, with plans to grow 1,250 plants per hectare on a total of 10,000 hectares (ibid.: 36). Petrobras also signed an agreement in 2007 with Italian oil company Eni to jointly explore biodiesel production in Mozambique (Petroleum Africa 2007), though these plans have not yet resulted in any concrete projects.

Policy versus practice in Mozambican biofuel projects and effects on food security

The ProCana project provides a stark illustration of the potential social, economic and environmental problems posed by biofuel production in Mozambique and other developing countries, and also demonstrates the failure of the government of Mozambique to uphold the principles it outlined in its own biofuel policy. ProCana was a project developed by a British corporation that planned to grow sugar cane and produce ethanol on 30,000 hectares in Massingir, in the southern province of Gaza. ProCana had signed a renewable 50-year lease on the land; all land in Mozambique is the property of the government, allowing favoured investors to secure huge tracts of land under long-term contracts with limited input from local stakeholders. This is symptomatic of the larger international problem of ‘land grabbing’, whereby foreign governments and corporations are buying or securing long-term leases to large portions of the arable land in developing countries (see, for example, GRAIN 2008; Cotula et al. 2009; Thaler forthcoming). Plans were made for Brazilian sugar company Dedini to supply a turnkey ethanol plant that would make use of Brazilian technology and would be capable of processing 438 million litres of ethanol per year (Christiansen 2008).

The allocation of land was immediately problematic. Despite claims that the land ProCana was acquiring was marginal and that therefore the project would not conflict with food production, outside researchers found the land in fact to be highly suitable and used for agricultural production, charcoal making and livestock grazing by local communities (Borras et al. 2011). The ProCana project also called for the displacement of several communities, including taking over land that had been allocated to people displaced by the creation of the Limpopo National Park (ibid.; Manuel and Salomão 2009). ProCana followed the letter of the law in that consultations were held with affected
communities, but agreements over land boundaries were then disregarded as ProCana encroached on family farmlands (ibid.), and there was a clear imbalance of power between an international corporation, which had already secured government support, and a group of poor peasant farmers (Borras et al. 2011). This power imbalance has been a problem with biofuel projects elsewhere in Africa and in the rest of the world (see, for example, Borras and Franco 2010). Consultations also tend to be gender-biased, with greater attention paid to male members of communities, even though women make up the majority of the rural labour force (Nhantumbo and Salomão 2010: 35).

Promises of job creation by ProCana and by biofuel projects that have been fully implemented have been dubious at best. ProCana’s job creation estimates fluctuated based on assumptions about whether or not the project could be implemented on a mechanised basis or a non-mechanised plantation basis, with the latter option creating more jobs (Borras et al. 2011: 224). The sugar industry also has relatively low labour intensity, with many jobs only seasonal, and labour requirements far below those of other crops; in nearby Zambia, ‘while 7,500 are formally employed in the sugar industry, around 200,000 people are informally engaged as outgrowers in the similarly sized cotton industry’ (Tschirley and Kabwe in Richardson 2010: 993). Brazilian ethanol production, meanwhile, may be the most advanced in the world, but Mozambique and other countries should not emulate the manner in which the sugar cane that feeds it is produced: by workers toiling in dangerous ‘slavery’ conditions for wages of approximately US$1,000 or less for a five- to six-month season (Höges 2009).

Some jobs may be created by biofuel projects, but the livelihoods of other community members are threatened. Biofuel projects frequently involve the permanent clearing of forests, removing opportunities for localised sustainable forestry and charcoal production. Sugar cane, like jatropha, also uses massive amounts of water, with the ProCana project, for instance, planning to irrigate its sugar cane with 407 million cubic meters of water per year from a nearby dam, depriving downstream subsistence farmers of water needed to grow their own crops and competing with cleaner hydroelectric power production (Borras et al. 2011: 223). The biofuel boom has also driven up land prices in much of the developing world, increasing the pressure on smallholder farmers to sell their land, while the relatively high prices of energy crops in comparison with food crops may induce farmers to join outcropping schemes in which they grow feedstock for large corporate producers. Increased landholding by bioenergy producers or industrial export farmers, as well as outcropping, shrinks local food production and shifts subsistence farmers from being autonomous food producers to being consumers at the mercy of the market and its fluctuations. The ProCana project collapsed in late 2009 after investors pulled out, and, similarly, Mozambique Principle Energy’s ethanol factory project has ground to a halt and may also collapse due to market conditions (Macauhub 2011b),
highlighting the volatility of biofuel investments and the potential for negative outcomes for those whose livelihoods come to depend on the biofuel industry.

Brazil has been involved in some more general or food-focused agricultural initiatives in Mozambique. Embrapa is working on a US$4.6 million soil conservation and recuperation project in northern Mozambique, looking to develop a successful model that can be applied across Africa (Barbosa et al. 2009: 77). Brazil is working with Japan to develop new crop varieties and to disseminate agricultural techniques and technologies that will allow a transformation of the Mozambican savannah into productive agricultural land, as occurred in Brazil’s cerrado, and there are other collaborative efforts to improve agricultural research in Mozambique (ABC 2010c; World Bank 2011b). The Brazilian embassy in Mozambique also launched a programme in 2003 to give food subsidies to families in exchange for their children’s school attendance, an initiative funded with donations from the Brazilian business community (Massingarela and Nhate 2006). In its initial stage, the programme provided grants of US$20 to 100 families (ABC 2012), and total project costs were under US$90,000 (AidData 2012). More recently, Brazil has committed to working to give about US$2.4 million to the World Food Programme and FAO for a scheme to provide locally produced food to schools and vulnerable groups in Mozambique and four other African countries (FAO 2012). These projects are tiny, however, when compared with the hundreds of millions of dollars being invested in the biofuel sector in Mozambique, sending a strong signal about Brazil’s priorities in Mozambique and in the rest of Africa.

Conclusions: Brazilian ambitions, African economies and defining development

Brazil has sought to position itself as an equal development partner of, rather than a more detached donor to, African countries, building on its cultural ties and its own experience of socioeconomic development during the twentieth century. In practice, Brazil has taken a middle road in comparison with the competing emerging economies:

between the Chinese-style of engagement – which is highly political and supported by the weight of the state-run machinery behind investments and development initiatives – and the Indian approach – which is characterised more by private sector investments and entrepreneurial activities across the continent. (White 2010: 229)

So far, Brazil has been successful in constructing a ‘softer’ approach, in contrast to China, developing local capacity and building new markets rather than simply extracting resources (see, for example, Lewis 2011).

To its credit, Brazil has created and become involved with a number of initiatives in Mozambique and elsewhere in Africa that have the potential to
boost food security and improve livelihoods, such as the Africa–Brazil Agricultural Innovation Marketplace, which brings together Embrapa and African researchers, and efforts to create seed banks for family farmers. The majority of Brazilian aid and investment, however, aims to improve agricultural production for the global market in ways that are not sustainable. Biofuel projects in Mozambique are designed to meet the demand created by EU regulations. These regulations are supposed to reduce fossil fuel dependence and greenhouse gas emissions, but the carbon- and water-intensive farming practices and land use changes involved in the production of biofuel feedstocks may offset any environmental benefits (see, for example, Solomon 2010 for a review). A leaked internal World Bank memo places the blame for the rising prices that sparked the 2008 global food crisis squarely on increased biofuel production (Mitchell 2008), and biofuel production worldwide has been linked to negative effects on the land tenure and food security of smallholder farmers and other rural residents (for example, Dauvergne and Neville 2010).

Brazil's programmes are beginning to put more emphasis on the inclusion of smallholder farmers, and Mozambique's biofuel policy specifically seeks their inclusion in the production of feedstocks (Republic of Mozambique 2009: 19). However, this inclusion may come at the cost of the farmers' autonomy, subjugating them to the demands of large agro-industrial firms in outcropping schemes, forcing them to switch to more expensive technologies, and curtailing independent food production, changes designed to bring the farmers into the transnational capitalist system that is already exploiting Mozambique's limited resources.

Brazil claims that its overseas development assistance is to help other countries emerge from poverty, yet Brazil's interests in development assistance and its corporate investment interests are tied together in a 'neo-mercantilist' web (White 2010: 239), making it difficult to view Brazil's altruistic rhetoric as sincere and giving some credence to the critique that emerged as early as the 1960s of Brazil's interest in Africa as seeking a piece of the 'new scramble for Africa' (Ribeiro 2010: 76). The recent ‘land grab’ of over 6 million hectares of land in northern Mozambique for Brazilian farmers to produce soya beans, corn and cotton for export (IHU 2011) bears out these suspicions of Brazilian neocolonial leanings.

For food security to be promoted and protected in Mozambique and elsewhere in Africa, notions of development must be decoupled from the concept of economic growth within a capitalist system. Agricultural production for the global market has led to an unsustainable system in which crop diversity has plummeted; small-scale farmers have been forced off their land or into the service of large corporations; and a small group of companies controls the production and distribution of inputs and processed products, with, for instance, five transnational corporations controlling 65 per cent of the global
pesticide market (Gonzalez 2004: 425). Biofuel feedstocks in Mozambique are symptoms of a broken system of agriculture and aid; these crops are promoted and consumed by international actors who either blindly or wilfully ignore their negative effects. Emphasis needs to be placed on production for domestic markets, on production of food crops, and on the improvement of less capital-intensive farming techniques that will allow small-scale farmers to sustain themselves while maintaining their independence. At present, Brazilian development assistance and investments are more benign and less cold-bloodedly profit-driven than those of China and some other competing countries, but they remain exploitative nonetheless.
relief for HIPC countries in exchange for poverty reduction strategy papers in the 2000s; and ‘good governance’ conditions, which can in theory be effective but in practice often end up setting politically or economically motivated double standards.

8 Thaler

1 This description has been used frequently in the case of Brazil. For one relatively early use, see Lopez and Kepp 1984.

2 The green revolution has been criticised, however, for improving agricultural production but maintaining and even exacerbating socioeconomic inequalities (Gonzalez 2004: 441).

3 Some critics prefer the term ‘agrofuels’, as they feel it better highlights biofuels’ ‘problematic environmental and social consequences’ (McMichael 2010: 609).

4 The state of São Paulo had successful research programmes for coffee and cotton, but this was a rare exception (Graham et al. 1987: 3).

5 Mozambique is ranked by the World Bank as the eleventh most aid-dependent country in the world, with aid still responsible for over 20 per cent of gross national income (World Bank 2011b), and the country has long found itself beholden to the demands of donor countries, development agencies and banks after years of fighting for independence and to protect the country’s sovereignty from Rhodesian and South African interference (see also Plank 1993).

6 The 2010 riots led the government to reduce the magnitude of some price increases and cancel others. For further analysis of Mozambican development, one of the best and most persistent critics of the development model in Mozambique is Joseph Hanlon (for example, Hanlon and Smart 2008).

7 See Thaler 2010b for a brief critique of such mega-projects.

8 Despite the discussion of biofuel production as a broad strategy for rural development, biofuel producers tend to cluster where infrastructure and market access are already well established (Schut et al. 2010), limiting the potential for large-scale biofuel investments to provide benefits to the most needy rural Mozambicans.

9 The fact that diplomats would mention specific companies as potential beneficiaries of their policies is symptomatic of the increasing influence of multinational corporations in Brazilian diplomacy (see Marques 2010).

11 Xiuli and Xiaoyun

1 The per capita requirement of 400 kilograms is a crude benchmark considered sufficient to meet the needs of the Chinese population, as well as the feed and seed requirements of farmers, given current food consumption patterns.

2 Based on the most recent complete information by country.

3 Note: data in value terms in this table are calculated at current prices. The new classification for the national industry has been implemented since 2003, and gross output values include services in support of agriculture, forestry, animal husbandry and fisheries.

4 In Chinese parlance, ‘basic’ means the provision of at least 95 per cent of China’s basic food (i.e. grain) needs from domestic sources.

12 Cheru and Modi


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