



**DISCUSSION
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**The Local Livelihood Implications
of Biofuel Development and Land
Acquisitions in Zimbabwe**

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ABSTRACT

In recent years, proponents of “green and clean” fuel have argued that the socio-economic and environmental costs of overreliance on traditional fuel (oil) could be reduced by a global transition to biofuel. Such discourses propound that a transition to biofuel could result in significant local and national benefits, including local job creation, infrastructural development, high revenue generation for local government authorities and less national reliance on fossil fuel and energy imports, and come with minimal negative impacts on the environment. With a dominant focus in the discourse on these purported benefits, little attention has been given to livelihood impacts related to land acquisition for the development of biofuel. With many risks and costs associated with fossil fuels, it is likely that many countries will move towards the “green and clean” alternative, yet there is thin academic understanding regarding the on-the-ground processes of land acquisition for biofuel production and how these in turn affect local people, whose livelihoods depend on land-based activities. Using a case study of bio-ethanol development in the Chisumbanje communal lands of Zimbabwe, this project assesses the processes and local livelihood implications of biofuel development and considers who is likely to bear the costs.

INTRODUCTION

Literature on the positive aspects of biofuel development, particularly in non-oil producing developing countries, has been steadily increasing in the past decade (Cotula, Dyer and Vermeulen 2008; Hall 2011). In the Global South, so-called “green fuel” development is expected to have a number of benefits to national governments and local people, including: less reliance on fossil fuel; helping to reduce fuel import bills; generating electricity as a by-product; and raising much-needed foreign currency through exports into regional and international markets (see Borras Jr., McMichael and Scoones 2010; Richardson 2010; Hall 2011). Biofuel development is also touted as a job-creation opportunity and vehicle for transforming impoverished rural settlements into vast and growing agro-industrial centres (Richardson 2010; Skutsch et al. 2011). In Zimbabwe, the potential for biofuel development to create jobs, foster rural development and enable energy sufficiency and security are touted as the main justifications for re-allocating communal land for biofuel production purposes. It is also argued that biofuels are clean, as they minimize greenhouse gas emissions and are therefore a perfect substitute for fossil fuels (Borras Jr., McMichael and Scoones 2010).¹ National governments consider these potential positive impacts to be economically advantageous, but they are often only measured and evaluated at the national level, while the local impacts — in communities most affected by biofuel production — have, arguably, received less focus. In particular, the impacts on rural livelihoods remain largely unexamined and are therefore unrecognized in biofuel-related policies (De Schutter 2011). This is likely a result of the exclusive attention that is paid to the

¹ The US Energy Information Administration's (EIA's) 2011 world carbon dioxide emissions by country data shows that Zimbabwe ranks 101 of 217 countries, emitting about 8.875 million metric tons of carbon dioxide annually (EIA 2013).

positive impacts of investing in clean and renewable fuels, given the fears over frequent increases in oil prices and security concerns in the main source markets (Hall 2011).

Despite the ostensible benefits of clean fuel, critics have started asking questions about the authenticity of such benefits and the potential impacts on livelihoods at local levels (White and Dasgupta 2010; Hall 2011; Hultman et al. 2012). For instance, with respect to reduced emissions, more recent findings reveal that calculations of greenhouse gas emissions from biofuel production lines may be omitting figures that may lead to an overestimation of their benefits compared to fossil fuels (see, for example, Fargione et al. 2008; White and Dasgupta 2010). Smith and Searchinger (2012, 479) suggest that life-cycle analysis models of biofuels potentially overestimate the positive impacts of biofuel use “because they ignore the emissions of CO₂ from vehicles burning the biofuels without determining if the biomass is ‘additional,’ and because they underestimate the ultimate emissions of N₂O from nitrogen fertiliser use.” In terms of other benefits, some recent studies suggest that the much-banded potential for greater tax revenue, lowered fuel costs and wealth distribution from biofuel production are misleading, and that there is “relatively little payoff in wage labour opportunities in return” (Richardson 2010, 917; see also Wilkinson and Herrera 2010).

In some cases, biofuel development activities have acquired communal land, despite the fact that such land is integrated into rural communities’ livelihood practices, which depend on agriculture and natural resources (Cotula and Vermeulen 2009; German, Schoneveld and Pacheco 2011; Matondi 2011). According to Hall (2011, 194) growing empirical evidence demonstrates “that a bigger proportion of the land that is being granted to private investors on long-standing leases or concessions” in Southern African countries such as Zimbabwe, Mozambique and Tanzania is, in fact, already under land claims, inhabited and used by local people. This trajectory of land acquisition is in sharp contrast with the new wave of twenty-first century global land reform, which aimed to redress insecurities from colonial policies that arose in the twentieth century (ibid.). This reallocation of land has subsequently resulted in disputes between local communities and government entities, as the governments often ignore the economic and social values of their communal land (Sjaastad and Cousins 2008; Spire 2010; Vermeulen and Cotula 2010; De Schutter 2011). Some of these biofuel development land deals have sparked conflicts and protests, ranging from civil society activism to civic unrest and political instability (Wisborg 2011). For example, in Tanzania (Hultman et al. 2012) and Mozambique (Schut, Slingerland and Locke 2010) conflicts arose because national plans to scale up biofuel production clashed with local preferences.

Despite these critiques, in recent years, communal land acquisitions for biofuel production have received much state and international backing. The promotion of biofuel in the Global South, and particularly in many developing African countries, is predicated upon the concept of “marginal communal land” (Nalepa and Bauer 2012). The definition of marginal land is fluid, opaque and sometimes contested, but generally refers to “land that is arable yet degraded and difficult to farm as determined by a combination

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While studying at Rhodes University in South Africa, Gladman Thondhlana completed his Ph.D. in environmental science. His dissertation explored the livelihoods of indigenous people living in dryland conservation areas in South Africa. Prior to working at Rhodes, Dr. Thondhlana was a research fellow at the Norwegian University of Life Sciences.

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**THIS PAPER
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of biophysical factors including soil profile, temperature, rainfall and topography” (ibid., 409). Communal land is defined as territory occupied by a cultural group of people or communities subject to rules or customs of that community (Pienaar 2008), rather than an individual or a private company. Often, the group subdivides and distributes the land to family members under a formal authority such as a chief. In many cases, communal territories have no legal owner, which means they effectively become state property (Hall 2011). The growing global characterization of communal farming in Sub-Saharan Africa as unproductive and economically inefficient is, in part, due to the challenges involved in defining marginal lands within the context of agriculture (Nalepa and Bauer 2012). This perception is viewed in the literature as part of a broader, dominant discourse on biofuel, agricultural development and cleaner energy sources, which is a product of resource productivism principles (ibid.) and shared by an influential network of actors that include private investors, governments, politicians and related service providers. In simple terms, a core dimension of the purported advantages of biofuel production is that these lands are underused and could be put to more productive use.

While aggregate estimates of the local livelihood impacts of land acquisition for biofuel production are available from media reports, the conflicting information from such reports (for example, Kawadza 2011; Mutambara, 2012; Zindi and Farawo 2012; Zenega 2013), combined with thin empirical and systematic academic analysis, means that such estimates should be treated with great caution (Richardson 2010; Deininger et al. 2011; Hall 2011). Systematic and detailed study is required to permit meaningful dialogue among policy makers, private operators, local community members and other interested stakeholders, with a special focus on the process of implementation and local livelihood impacts.

Contributing to such a comprehensive study, this paper focusses on the Chisumbanje communal lands in Zimbabwe, where the development of the biggest bio-ethanol plant in Africa resulted in the dispossession of local people from their farming land and other land-based livelihood activities. Given the background of fast-track land reform in Zimbabwe, where white-owned farms were appropriated to black people for “socio-economic empowerment,” biofuel development for national interests was set on a collision path with local livelihood needs. This study aims to understand the processes and promises of biofuel development versus the actual livelihood impacts at the local level. The policy implications of the findings are also discussed. It is hoped that a more fulsome understanding of these local impacts will contribute to their more systematic consideration in global discourses on biofuel development in Africa.

DESCRIPTION OF THE STUDY SITE AND THE BIOFUEL PROJECT

THE STUDY SITE

Chisumbanje is located in Chipinge District, in the Manicaland Province of Zimbabwe (Figure 1), and is made up of seven different sub-villages namely Muyondodzi, Kaguvi, Miyondosi, Manyanga A, Manyanga B, Guva Rekipi and Mutumburi. Located close to Chisumbanje are other relatively smaller villages including Garahwa, Matikwa and Chinyamukwakwa. Each village has a village head who reports to one chief — Chief Garahwa. Data was collected from all the sub-villages of Chisumbanje and from Matikwa and Chinyamukwakwa villages. These villages were selected because households in these areas were displaced from their farming land to pave way for more sugar cane plantations for biofuel development.

Figure 1: Location of Study Site



Source: Author

Unfortunately, there are no recent local poverty assessments for Chisumbanje, but some national estimates suggest that by 2008, the national unemployment rate was 94 percent, with up to 80 percent of Zimbabweans living on less than US\$2 per day (The Zimbabwe Situation

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2009). Most of the poor in Zimbabwe are smallholder farmers, living off the land in rural areas such as Chisumbanje. With regards to energy, most people in the area use fuelwood as their primary source of energy, as most households are not connected to the electricity supply grid.

Zimbabwe is divided into different agro-climatic regions according to differences in effective rainfall (Vincent and Thomas, cited in Gambiza and Nyama 2006) and the areas in and around Chisumbanje fall under region five, a largely semi-arid region. With a mean annual rainfall of about 400mm and prolonged dry spells, most of this area is generally considered by the national government as a “marginal landscape” (using a biophysical lens of marginality) and unsuitable for crop production without irrigation (Gambiza and Nyama 2006). In practice, however, these drylands provide land for the production of maize and other drought-tolerant small grains such as millet and sorghum, which are all important food sources, as well as economic opportunities for locals. Moreover, most communal farmers practice cotton production, a lucrative cash crop in Zimbabwe. Livestock farming is also an important livelihood source in the region, used as a source of draught power, and providing a source of meat, milk and manure, and cash income. In sum, although the area is drought-prone, its “unsuitable” land remains an important source of livelihood for many local people.

THE BIOFUEL PROJECT

The Chisumbanje bio-ethanol plant development started in 2009 and is claimed to be the largest in Africa. Around 40,000 ha of land were acquired to grow sugar cane in order to produce bio-ethanol. Just 5,112 ha were acquired under contract with the agricultural development parastatal organization, the Agricultural Rural Development Authority (ARDA), and the rest came from communal farmers. In the study area, farmland is located away from people’s homesteads, thus most households were not physically displaced from their homesteads, but nonetheless lost access to their farming land. The ethanol plant, built at a cost of around US\$600 million, is a public-private partnership between the ARDA and private firms Macdom Investments and Rating Investments. The main funder of these private firms is Billy Rautenbach, a controversial businessman, who is under EU and US targeted sanctions lists because of his close association with Zimbabwe African National Union — Patriotic Front (ZANU-PF) (Hall 2011).²

Zimbabwe has experienced key national challenges in recent years, including fuel shortages, an erratic electrical energy supply, and high levels of unemployment and poverty, thus the main motivation for the biofuel project centred on the benefits it could offer to address some of these issues. Media reports (such as Zindi and Farawo 2012; Zenenga 2013) say that once fully operational, the bio-ethanol project would, among other things: produce approximately 100 million L of ethanol annually — enough to meet 50 percent of Zimbabwe’s fuel needs; generate 20 MW of electricity,

2 ZANU-PF was the then ruling party in Zimbabwe, which entered into a Government of National Unity (GNU) with the two factions of the opposition Movement for Democratic Change (MDC) in 2008. The GNU ended in July 2013 after ZANU-PF won the disputed presidential elections by an absolute majority.

with an excess of 15 MW to be sold into the national grid; trigger local-level development; and create more than 5,000 jobs. Hence, this project is, at the national level, viewed as one of strategic importance, with potential benefits that fulfill essential national economic and political priorities (Mutambara 2012). It has already been reported that since the implementation of the biofuel project, more commercial banks have moved into Checheche Growth Point (the local business point closest to Chisumbanje) and demand for commercial land development in Checheche is at an all-time high (*NewsDay* 2011; Zindi and Farawo 2012).³ However, while some media reports have focussed on the positive impacts of the biofuel project, others have highlighted the negative livelihood impacts. Therefore, there is need for a more empirical analysis of the biofuel development repercussions for rural livelihoods, in particular issues related to the winners and losers within the biofuel complex (Borras Jr., McMichael and Scoones 2010).

METHODS

This research was conducted in and around Chisumbanje between July and August 2012 using structured household surveys, in-depth unstructured personal interviews and researchers' observations. Household surveys were structured to get information on the socio-economic impacts of the biofuel project by asking questions related to biofuel-induced changes on household livelihood systems and portfolios and local land use. To capture multiple perspectives from as wide a range of respondents as possible, groups of people who had interfaced differently with the biofuel project participated in in-depth unstructured interviews. Interviewees included displaced farmers whose farmland was directly acquired by the biofuel project, local community leaders (the chief and village heads), biofuel project current and former employees, representatives of pressure groups, farming associations and people who had no direct association with the biofuel project.

Given the likelihood of the researchers being treated with suspicion by the respondents, due to the general political volatility in Zimbabwe, permission to conduct the research from the local police authority was sought and granted, after a thorough explanation of the research objectives and purpose. On promise and condition that the study remained non-partisan, further permission was sought and granted by the chief and the respective village heads to access the different villages. The objectives and purpose of the research and anonymity and confidentiality of responses were explained to prospective respondents before every interview, thus the surveys were conducted with the respondents' informed consent, and most respondents agreed to answer questions. Despite efforts to solicit appointments with representatives of the local Chisumbanje branch of the Local Rural District Council, various government departments and the project private investors, none were available for interviews.

³ At the time of the research, the biofuel plant was closed due to political issues discussed in the paper. Thus, despite the state's win-win narrative, the project was neither profitable nor pro-poor.

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A total of 317 households were surveyed, representing about 20 percent of the households that lost agricultural land as a result of the biofuel development project. Households in the selected villages of Chisumbanje were randomly approached, and then the snowball sampling⁴ technique was applied (since not all households lost land) to get information on the impacts of the biofuel project from those who had directly experienced loss of land. Twenty in-depth personal interviews were conducted with local people (men, women and youth) arbitrarily encountered at public places such as shops, the fruit and vegetable market, schools, churches and along the road. Most of the respondents demonstrated knowledge about the biofuel project and some of its livelihood impacts, but it was not always possible to validate interview data. To our knowledge, there is not much published literature on the project and government documents are not readily available. In the interviews, potential respondent biases, such as exaggerating both the positive and negative impacts of the project for their own personal or political reasons were anticipated. The responses and impression of most respondents (especially displaced farmers) were sometimes clearly overrun by emotions and anger. Considering these potential biases, careful precaution was taken through qualifying questions and re-emphasizing that this was solely a research project and not an assessment for compensation or a fault-finding mission. Despite the potential biases, the sample was large and diverse enough so as to engender the researchers' confidence that overall accurate data on the biofuel project process and livelihood impacts was collected.

RESULTS AND DISCUSSION

This section presents the basic socio-demographic characteristics of respondents and households. It then explains and analyzes the land acquisition and consultation processes. The third section explores the impact of land acquisition and the biofuel project more broadly, from the perspective of research participants.

SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS AND HOUSEHOLDS

Of the 317 respondents interviewed, 57 percent (n=182) were females. Female overrepresentation is a common feature in rural surveys, as household surveys are administered during the day, where and when women are attending to household responsibilities. Slightly more than half of the respondents (52 percent, n=165) were household heads, 38 percent (n=121) were spouses and the rest (10 percent, n=31) were eldest household members. Seventy-three percent (n=135) of the interviewed household heads were males. The education level (the average number of years spent in school) of the respondents was 6.5 years, slightly higher than the national average of 5.4 years. More than half (56 percent, n=177) of the sample had attended primary school, but 23 percent of the respondents (n=72)

⁴ The snowball approach can potentially result in sample selection bias. In this case, however, we were interested in those households who lost land and we assumed that the approach would be unlikely to affect the results in a significant way.

had no education at all. The remaining 21 percent attended secondary school (n=66), but of these respondents, only 24 percent (n=16) reached the advanced level (the highest secondary level education before entry into tertiary education). Of all the respondents who had attended secondary school, very few had either ordinary or advanced-level certificates. This is significant because a low education level is often associated with people who have little or no skills and who are not employable in the formal job sector. In most rural settings, such as the one in the study, respondents with low education levels have to settle for casual and low-paid jobs, and land-based activities are considered key livelihood sources.

Households varied in size from 1–20 people, with an average of 6.6 members. Sixty-six percent of the surveyed households (n=210) reported at least one household member working away from home, averaging 1.61 absentee household members per household, with a majority of them working in nearby South Africa. The average age of the respondents was 43.8 years. The proportion of household members between 16 and 60 was slightly above half (52 percent, n=1075), a fairly large proportion of the economically active age group. The remaining proportion consisted of the 0–15 age group and the elderly, demonstrating a relatively high number of dependents in the study area, especially given that most of adults have no formal jobs and are still highly dependent on household heads. The respondents reported a combination of different household income sources, including permanent employment (23 percent, n=73), part-time and casual employment (35 percent, n=112), self-employment (36 percent, n=74), crop production (10 percent, n=31) and remittances (28 percent, n=82), among others.

LAND ACQUISITION AND CONSULTATION PROCESSES

The Chisumbanje biofuel project represents a unique case, as the state has engineered and supported the forced removal of large numbers of rural households from what residents consider “their” communal farming land — an act contrary to its fast-track land reform program targeting and forcibly expropriating mostly white-owned commercial farms for redistribution to poor black farmers. Among the fundamental concerns most reported by local users was the way their communally-owned land was acquired by private investors through state intervention. The study thus explored the practices that were used in land transfer negotiations from local people to the biofuel development investors and the subsequent impacts on local people’s livelihoods (see German, Schoneveld and Pacheco 2011). Most displaced farmers reported that they were neither consulted nor formally advised about the land acquisition agreements or before the land clearance commenced. According to respondents, consultation was largely confined to the chief and local district council officials, and the biofuel project went ahead without local people’s approval. There were no meaningful platforms

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to provide greater voice for local people affected by the biofuel development project.⁵

The displaced households that were surveyed also mentioned the use of intimidation and the disrespectful attitude of the private investor management firm, supported by state agencies such as police. Some of the displaced farmers reported that the company insensitively ploughed down food and cash crops that were almost ready for harvesting without notice and pointed out that the acquired land is not yet under sugar cane (biofuel) production. Displaced farmers also reported they had delayed planting crops in their remaining portions of land, due to uncertainty over whether it would be acquired by the private investors.

There were also verified reports of damaged local roads, especially in and around the Chinyamukwakwa area, emanating from flooded canals and dams. When the issue of damaged roads was raised at the chief's monthly meeting with village heads, it quickly turned into a political symposium. The researchers observed first-hand a contentious local meeting on community issues, where one particular group of village heads, ostensibly ZANU-PF supporters, seemed to dominate conversation while many local leaders stayed quiet. A few vocal village heads, clearly aligned to the ruling ZANU-PF party, blamed the then incumbent opposition MDC-T Member of Parliament Meki Makuyana for not taking community issues to higher authorities. Another smaller group of village heads said that this was a problem caused by the private investors and it was the investors' sole responsibility to fix the problem. A majority of village heads, however, kept quiet, we suspect, from fear of political victimization from ZANU-PF supporters. Thus, even when community-level meetings occur, they tend to be dominated by a few powerful people. Some respondents at the meeting reported that the chief and some of the headmen who were pro-biofuel development clandestinely worked with the private investors for direct personal gains, such as jobs for their families. Evidence from other countries suggests that even the so-called meaningful consultations neither confer any authority, nor shape the terms of biofuel investments (Vermeulen and Cotula 2010).

LAND RIGHTS ISSUES AND LEGAL FRAMEWORKS

The unilateral seizure of communal land draws attention to tenure and legal issues around land transfer deals in the biofuel complex. In Zimbabwe, though communal land falls under customary tenure through the authority of chiefs, the land is de facto state-owned, similar to countries like Ghana (see Vermeulen and Cotula 2010). Thus, customary land systems and use rights in Zimbabwe (mediated and managed by traditional chiefs and local district councils) exist and receive recognition albeit without protection from national law. Customary land tenure systems are subservient to state land title (Hall 2011). While the local households surveyed felt that land was forcibly “grabbed” by the government, there are reports that the so-called

5 Similar findings have been documented elsewhere. For example, Schoneveld, German and Nutakor (2011) document non-disclosure of land agreements between chiefs and private investors to land users in Ghana and conflicts over the distribution of land payments given to tribal chiefs in Papua, Indonesia.

grabbed land was never communal, but was loaned to local people by the ARDA, which at the time did not have sufficient capacity to productively use the land. In-depth discussions with respondents revealed that some of them knew of this, and they talked about ARDA boundaries established some years ago. Even with this knowledge, most of the respondents felt that the way the land was taken was unfair and that the biofuel deal should have been restricted to the initial 5,112 ha that were used by the ARDA. The displaced farmers felt that when negotiations came to a choice between investor interests and local community needs, the government had sided with the private investors.

Comprehensive details about this land deal are not in the public domain (Hall 2011) and seem to be a closely guarded political secret. This case, however, illustrates the complexity of land-systems issues in developing countries: where land rights are unclear, with multiple claims on the same land, the state has the final say. Land in many African countries is primarily under state control. In a study of land deals in Africa, Vermeulen and Cotula (2010) found that locals are not often party to land allocation processes, nor are they consulted. Private investors have capital power, which is a scarce economic resource, while local communities provide labour, a ubiquitous resource which gives them little bargaining power. As Dauvergne and Neville (2010, 631) aptly note, “The emerging biofuel alliances between the state and private investor reinforce processes and structures that increasingly wrest control of resources from subsistence farmers, local people and people with insecure land rights.”

POLITICS IN BIOFUEL DEVELOPMENT

With respect to access to irrigated land plots and employment opportunities, household surveys showed that most respondents believed the process was not transparent, but rather, riddled with nepotism, unfairness and was more about settling political and partisan interests. Most of the displaced farmers who were surveyed felt that land was forcefully acquired from them, perhaps because the constituency is known to be a stronghold of the opposition MDC-T party (see Hall 2011). In fact, the people in this area have almost always voted for opposition political parties since independence in 1980. The surveyed farmers argued that the state, and a few people who were apologetic to the state, were benefitting from the bioethanol project at the expense of community welfare. For example, a few beneficiaries were allegedly hand-picked by the chief to either provide sugar cane (as out-growers) to the ethanol plant or benefitted from irrigated plots as a result of their political loyalties (ibid.). It is this powerful network of groups and beneficiaries who lobby for biofuel development, knowing that they will benefit and not bear the brunt of socio-economic costs. These same beneficiaries claimed that the MDC-T was stalling the ethanol project for political gains, because the project was perceived as belonging to the ZANU-PF (Paradza 2012).

Other hotly debated issues that have become highly political relate to whether or not the biofuel project satisfies Zimbabwean indigenization

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laws⁶ and if the coalition government should back mandatory blending⁷ suggested by the private investors. However, some members of the coalition government view the project's primary investor, Rautenbach, as not “Zimbabwean enough” (Makova 2012). With regard to mandatory blending, former Energy and Power Development Minister Elton Mangoma (from the MDC-T party) believed that the project had not given enough justification why all motorists should be forced to use ethanol petrol blend (Nyambabvu 2012; Paradza 2012). Further, issues related to ownership of the project and how the project should be operationalized are still shrouded in mystery, with reports that some members in the ZANU-PF party have personal interests in the project (see Nyambabvu 2012). This political bickering and land disputes with local communities resulted in the closure of the biofuel plant in early 2012, forcing thousands of workers to be retrenched. Some of these disputes have degenerated into verbal abuse and violent conflict, with some “irate villagers, workers and local war veterans threaten[ing] to beat up Energy Minister Elton Mangoma...blaming him for the closure of the...ethanol plant” (New Zimbabwe 2012).

The preceding discussion begins to highlight the differential livelihood impacts (both benefits and losses) that groups and individuals have experienced in the region. Despite the fact that the negative consequences of land acquisition for biofuel development are generally uniform across displaced social groups, any potential and real benefits to the displaced farmers are, in part, influenced and shaped by patronage and partisan politics in as politicized a landscape as Zimbabwe, which consequently breeds winners and losers. In this case, the overall winners are the state and the private investors, while this research shows that the loser is the local community — although some business owners and powerful individuals with the “right” or strong political ties can tap more from the benefits of biofuel development.

Prosper B. Matondi (2011) views the unregulated and chaotic manner in which land is acquired for biofuel production in some countries in the Global South as a reincarnation of the historical exploitation of Africa as a source of raw materials. The only difference is that current land acquisitions are state-supported (Matondi 2010; Hall 2011). As Borrás Jr., McMichael and Scoones (2010, 584) argue, much depends on the nature of the state, existing institutions, historical state-society land-tenure relations, and commitment by the state to consider and address the challenges related to biofuel development, because where there are strong incentives for the state to act in a predatory way, allying with multinational capital for private gain rather than as an “embedded” developmental state, the risks of negative outcomes increase. The current conflict between national interests and local needs in Chisumbanje exposes how actors perceive the benefits associated with biofuel development and influencing biofuel land deals.

6 Under Zimbabwe's new indigenization legislation, all foreign firms are supposed to transfer 51 percent shareholding to locals.

7 Mandatory blending refers to compulsory blending of petrol and biofuel. The government of Zimbabwe requires that all imported petrol be blended at levels of 10 percent anhydrous ethanol and 90 percent unleaded petrol.

THE IMPACTS OF BIOFUEL DEVELOPMENT

Loss of Land and Livelihood Insecurity

As expected, displacement from agricultural land and the related loss of land-based livelihoods were reported by 98 percent (n=311) of the surveyed households as the major negative impacts of the biofuel project. The average land size for the surveyed households (n=280) was reported to be 5.2 ha before the onset of the biofuel development project. At that time, land in the study area was used for various food crops and cotton production. All the surveyed households of displaced farmers practiced mixed food cropping, cultivating maize (the staple crop), wild cane, pumpkin plants, watermelons, ground nuts, round nuts, jelly melons and drought resistant crops such as sorghum and millet on the same field. Most surveyed households cultivated crops for subsistence purposes and only sold (mainly maize) when there was a surplus. The reported annual productivity of maize per household ranged from 100 kg to several tons. Apart from food crop production, cotton farming is traditionally a key cash crop in the study area. The calculated average cotton productivity per surveyed household (n=106) was 16.5 bales per year, ranging from 0.75 bale to over 200 bales depending on size of land, rainfall patterns and inputs (labour, fertilizers and pesticides) among others.⁸ Although almost all surveyed farmers mentioned recurrent droughts as a limiting factor in food- and cash-crop yields in recent years, they said that growing a variety of crops was a way of adapting. In years of drought, drought-resistant crops such as sorghum, stored previous harvests, cotton commercialization and livestock sales cushion households financially.

The respondents reported that they had lost most of their land to pave way for sugar cane plantations for the biofuel project. Only 26 percent (n=87) of all the surveyed households indicated they were given 0.5 ha plots of irrigated land as part of the compensation package but in reality, nearly 79 percent of these (n=69 households) had no access to irrigation water, which caused crop productivity to be low or non-existent. These households reported an overall decline in the standard of living, as compared to their situation prior to the arrival of the plant, due to lower or zero yields. Further, more than half of the households that successfully acquired irrigated land found these land parcels were much smaller and much further away from their homes than the land acquired by the biofuel project. Farmers who received new plots were also concerned that they had no shade on their land, as all the trees were bulldozed when land was being cleared to make way for sugar cane plantation. The displaced farmers reported that land is critical for future generations in the area, as it was divided among senior male members of the household. This implies that land has important social values but these local perceptions about land issues are likely to be ignored by classic land economics (see Blignaut and de Wit 1999) and large-scale agricultural development projects such as the one under study (Vermeulen and Cotula 2010).

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8 On average, one bale is equivalent to 200 kg.

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**THE BIOFUEL
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The loss of land also meant the loss of important cash income from cotton farming. All the surveyed households, as well as individuals who participated in in-depth interviews, agreed that cotton farming had been the traditional cash income, in an area where other economic opportunities are limited. Cash income is used to supplement food in times of droughts, pay for school fees, health costs and other day-to-day livelihood costs. Moreover, the respondents said that limited or no access to agricultural land means that there is limited fodder for livestock. In their view, the biofuel project simply replaced food crops with fuel crops, a situation that has undermined household food security, putting them deeper into poverty, as they did not benefit from the fuel crops as directly as they had from the food crops. Household surveys and personal interviews revealed that the respondents perceived that food security, notwithstanding recurrent droughts, was better off before than after the biofuel project. They reported increased foodstuff purchases due to the reduced ability to grow cash crops and food crops.

All the surveyed households reported food shortages. Out of this 61 percent (n=193) of the respondents reported monthly food shortages, while the other respondents said food shortages lately were experienced variably between the months of October and February of each year. These livelihood impacts are consistent with findings elsewhere. For instance, German, Schoneveld and Pacheco (2011, 6) argue that “with few households able to acquire replacement land, and replacement land constituting a fraction of initial landholdings, agricultural incomes are severely compromised.” Wies (2010) contends that acquisitions of land for biofuel production undermine food production and aggravate land availability for rural livelihoods. Some of the displaced farmers (117 households) were local farmers who were official sugar cane out-growers under the parastatal organization, the ARDA. During the survey period, some of the interviewed out-growers said they had stopped operations and that their land was forcefully acquired by the project. Though media reports later emerged that these farmers were finally given offer letters to restart sugar cane production, they had not commenced operations at the time of the study (Mutambara 2012). For out-growers, non-payment of their full compensation for lost productivity during the negotiation period and for the cane they had delivered in the 2011-2012 season was also raised as a major concern.

Asked what form of biofuel development model they preferred, most respondents said they would rather have their customary land system back, arguing that the biofuel project should have concentrated on its 5,112 ha under contract with the ARDA. Some respondents suggested the idea of out-grower schemes, which, with technical assistance through networks of field staff, could produce enough sugar cane to sell to the biofuel project. This way, the locals could directly and sustainably benefit from biofuel development through sugar cane sales to help buy food and other household amenities. Commenting on the impacts of biofuel to local farmers, White and Dasgupta (2010, 605) explain that “the specific destination of the crops as fuel, food or other final uses in faraway places is probably of less interest than the forms of (direct and indirect) appropriation of their land and the forms of their insertion or exclusion as producers in global commodity chains.” The poor compensation regimes, poor governance of payments by the private

investors, unfulfilled promises and the delivery of benefits of inferior quality have all resulted in dissatisfaction among displaced farmers, consistent with findings by German, Schoneveld and Pacheco (2011). This has led some village headmen and their constituencies to push for meaningful compensation or to get their land back, especially acquired land that is currently not under cultivation (ibid.).

Impacts on Access to Natural Resources and Livestock Fodder

Land acquisitions for biofuel feedstock production create direct risks of loss of land and natural resources for local people (De Schutter 2011; Hall 2011; Hultman et al. 2012). This can, in turn, have major repercussions on local livelihoods, especially given that rural households are highly dependent on natural resource products for livelihood security (Thondhlana, Vedeld and Shackleton 2012). Household surveys showed that 99 percent (n=314) of all households used fuelwood on a daily basis as a primary source of energy. A substantial proportion of households also reported the use of poles, thatch and reeds as building material. Most of the surveyed households had at least one traditionally built housing unit, constructed using natural resources such as soil, poles, rope made from trees and thatching grass. Further, wild foods such as mice, birds and vegetables and fodder for livestock were reported as key resources in local households' food basket and livelihood systems.

However, the loss of land to the biofuel project means the local people are no longer allowed to harvest these resources. For instance, communities used to harvest cotton stubs in their fields and used them as fuelwood, or cut branches of trees from their fields, but now have to travel for return distances ranging from four km to 40 km to get fuelwood and other natural resource products. The respondents also reported increased purchases of natural resources they once sourced for free. Similar findings have been reported on forest products in Indonesia (German, Schoneveld and Pacheco 2011).

The loss of access to livestock fodder was also reported. Seventy-five percent of the surveyed households (n=237) owned livestock including cattle, goats, donkeys, pigs and poultry, ranging in number of animals per household from 1–45, 1–23, 1–4, 1–15 and 1–100, respectively. Most households practiced unsupervised grazing soon after harvesting their food and cash crops, and also collected crop residue as fodder to be used during planting seasons. Grain was commonly used as supplementary feed for pigs and chickens at home. However, this practice is no longer possible, as most farming land was acquired for biofuel production.

Prior to the arrival of the biofuel company, grazing across communal lands was a common and important practice. Now, livestock owners report that there are strict regulations and penalties for stray livestock imposed by the company, such as the levying of high fees. The respondents reported that it costs around US\$5 per animal per day for captured livestock, while some of the livestock owners were casual workers at the biofuel company, earning just US\$1 per day. Given this disparity between fines and earnings, the livestock owners argued that they could never get sufficient money to

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WHILE THE SWITCH FROM TRADITIONAL FUELS TO BIOFUELS IS GENERALLY TOUTED TO BE A PRO-ENVIRONMENT TRADE-OFF, WATER AND AIR POLLUTION CAUSED BY THE ETHANOL PLANT WAS A FREQUENTLY CITED CONCERN
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pay for their livestock. They had resorted to selling some of their remaining livestock at very low prices to pay for the captured livestock. Some surveyed households also reported that their animals were being shot dead if they entered into acquired land, or were underfed when they were captured. The surveys revealed that households attempted to engage the local chief about this, but their efforts were in vain. As a result, some livestock owners moved their livestock to neighbouring villages (for example, the Gudo area) and to nearby Mozambique, despite the risks, including theft, conflicts with locals and fines. In many rural communities, cattle represent a sort of bank account that households withdraw from in times of hardships and need (see Benjaminsen et al. 2006; Thondhlana, Vedeld and Shackleton 2012). Thus, the loss of livestock may mean that many households have become more livelihood-insecure and now bear an overall increased burden of ensuring household food security.

The ramifications of reduced access to land and natural resources include a substantial increase in the amount of time required to gather important natural resources, and changes in resource-use patterns. Conflicts with neighbouring Gudo residents have been reported, resulting from increased resource use pressure in the area (natural resource collection, notably fuelwood and livestock grazing). The surveyed households reported that after walking for long distances, they often lose their fuelwood or pay huge fines to get back their captured livestock. Thus biofuel development may not only have localized livelihood impacts, but also ripple effects that are felt in surrounding communities. Such impacts should be anticipated and considered when forming biofuel policies.

Water and Air Pollution

While the switch from traditional fuels to biofuels is generally touted to be a pro-environment trade-off, water and air pollution caused by the ethanol plant was a frequently cited concern among survey respondents. There were claims that the company discharged untreated, fertilizer-rich waste water from the plant directly into open water sources used by local communities for washing clothes and bathing, and for livestock care. Media reports of illnesses and deaths of livestock and fish in the Chinyamukwakwa area (see, for example Chaeruka 2012), resulting from the discharge of untreated waste water into the local Jerawachera River, were confirmed by the respondents, though the exact records could not be verified. The respondents and other household members present during interviews also expressed concern about the potential health risks from polluted water sources and a pungent smell emitted by the ethanol plant when in operation. For households located closer to the unpaved, dusty roads leading to the ethanol plant, their major concern was the possible health effects of dust inhalation, especially for the young, frail and elderly. None of the surveyed respondents had detailed medical knowledge of the health risks, but perceived that air pollution would lead to respiratory diseases in the near future. These findings are consistent with empirical results in Malaysia (German, Schonveld and Pacheco 2011) and Brazil (Wilkinson and Herrera 2010), where mill effluent was discharged into communal water

sources. Pollution of the local environment and the potential risk to local livelihoods require greater scrutiny in biofuel development projects.

Job Creation and Local Development

To explore whether or not biofuel development in the study area is delivering on its stated promise of stimulating rural development and local livelihood security, the study looked at job creation and working conditions. The study also looked at the employment opportunities lost in other sectors, such as agriculture, to fully understand the net benefits of biofuel employment opportunities. The creation of jobs, local development and land irrigation were cited as positive aspects by 33 percent (n=104), 15 percent (n=48) and 11 percent (n=34) of the respondents, respectively. Household surveys and personal interviews showed that all the respondents who were not directly affected by the ethanol plant (i.e., had no land or did not lose land) including business owners, informal traders, bricklayers, welders and carpenters, felt that the biofuel project brought increased opportunities for local development as evidenced by more banks, the emergence of small businesses (small grocery outlets, furniture and hardware shops, fuel stations and hair saloons), increased downstream job opportunities, housing construction and a general improvement in the standard of living (less frequent power cuts, more reliable mobile networks and transport). However, the respondents also indicated that some of these benefits were short lived, since ethanol production activities at the plant were temporarily stopped in February 2012 due to a combination of community-related disputes and technical and business-related issues (see Mutambara 2012). The biofuel plant was reopened in March 2013, following assurances that the ongoing disputes would be addressed.

Most displaced farmers reported that despite the promises of job creation, they had not seen any substantial employment opportunities for local people. There was a perception that most workers at the plant were not locals but came from other places. This is understandable since most of the locals are not skilled enough to qualify for careers in high tech farming, sugar cane milling, electricity power stations or the ethanol distillery plant. The company has previously claimed that it employs around 4,500 people, but National Social Security Association records show that it employs substantially fewer, about 3,237 people (Mutambara 2012). Of this, only 1,099 workers (34 percent) are from the local Chipinge district, and out of 975 workers employed by the ethanol-producing factory, only about 20 percent (n=195) are locals.

The findings with respect to the quality of the jobs were mixed. Some respondents felt that most job opportunities for locals were limited to short-term shop-floor work, such as sugar cane planting, harvesting and cleaning, while all of the senior positions were offered to outsiders. Some workers at the ethanol plant reported ad hoc retrenchments, low wages and late salary payment, working without proper protective wear and grossly exploitative working conditions, but kept quiet to keep their jobs. Others, however, including former and current employees, identified jobs as the most important and immediate benefits emanating from the biofuel investment, and reported that their wages were relatively higher than those

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in other industries. These differences in perceptions could be attributed to the respondents' previous experiences and job positions. The former were likely former subsistence farmers and semi-skilled persons, and therefore had tougher but low-paying jobs such as cane cutting, while the latter may have had skills required for high paying jobs.

While the benefits of the biofuel plant have been recognized to be few and accruing to only select individuals, even those benefits are at risk. All the employees and the other respondents interviewed admitted that their jobs and other benefits were at risk since the company had halted production activities. While biofuel production provides opportunities for employment within the plant or along the supply chain and other downstream industries (Deininger et al. 2011), the majority of the jobs directly created by the plant “are usually unskilled, short-term and small in number relative to the size of the investment” (Vermeulen and Cotula 2010, 912). Traditionally, cotton production in the study area provided cash income to farmers and job opportunities for many people during planting, weeding and harvesting seasons. In fact, cotton production promoted small-scale downstream industries in and around Checheche Growth Point, and development in the area was contingent on the growth of the cotton production industry. Cotton production had seen the emergence of a significant number of cotton buyers in the area, namely the Cotton Company of Zimbabwe, Terrafin Holdings, Parrogate Investments, Sino-Zim, Romsdale, Grafax, Insing, Alliance, Cargil Zimbabwe and a ginnery established by Parrogate. These merchants employed a substantial number of local people. Unsurprisingly, household surveys and personal interviews showed that most respondents perceived that cotton farming was a better fit for the community, because it offered better backward and forward linkages with the local economy than biofuel production.

Some farmers had taken loans from these cotton buyers (companies) in return for supplying their cotton harvests, but they were battling to pay off their debts without land. Without cotton production, the respondents reported hardships and deepened poverty at the household level, demonstrated by the inability to repay loans, pay for school fees or to purchase sufficient food. Some estimates in Brazil suggest that soybean, palm oil and sugar cane plantations, apart from displacing indigenous communities, generate one-tenth the number of jobs created by family farming per 100 ha, partly because of a high degree of mechanization (Holt-Gimenez cited in Borrás Jr., McMichael and Scoones 2010; Wilkinson and Herrera 2010; German, Schonveld and Pacheco 2011). Given that the majority of the households largely perceived that jobs had been lost (for example, in the crop-production sector and at cotton-buying companies), there is a need for more empirical investigation of the net impacts of job creation by biofuel development enterprise versus lost jobs in other sectors.

In addition, most respondents reported that their energy security had not improved as a result of the biofuel project, as they still relied on fuelwood as the primary source of energy. In fact they argued that they were worse off, since they could not harvest any fuelwood from the “occupied” farms.

POLICY IMPLICATIONS AND CONCLUSIONS

The advent of the Chisumbanje biofuel development project, like many other similar projects elsewhere in Africa, is considered a strategic investment at the national level. Biofuel development in the study area is premised upon the development of “marginal” and “unproductive” land to generate benefits such as energy security and independence, efficient irrigation schemes, smallholder out-grower schemes, job creation, electric power generation and the stimulation of downstream industries. Though the livelihood impacts need to be re-examined since the biofuel project is just about four years old, evidence generally suggests that the biofuel investment has failed to live up to its expectations and promises. Most local people, particularly displaced farmers, felt they had been left worse off than they would be without the biofuel investment. From their perspective, instead of generating sustainable benefits, biofuel development has contributed to the loss of livelihood sources (land and natural resources). There is a clear collision between national interests and local livelihood needs. The state envisions biofuel development as a pathway to development — an economic opportunity to energy independence, while the locals see it as a threat to their livelihoods.

Indeed, rather than being merely “marginal” or “unproductive,” this study shows that for most households in the Chisumbanje communal areas, the land appropriated for biofuel development was crucial for land-based livelihood activities such as food- and cash-crop farming, livestock production and direct natural resource use among other income sources. Some of these income sources were reported to be increasingly insecure due to recurrent droughts, for example, maize crop farming. However, other drought-resistant crops, such as sorghum and activities such as cotton farming and livestock production represented a buffer against fluctuations in other income sources. As such, this study’s findings add to emerging evidence (e.g. Benjaminsen et al. 2006; Hall 2011; Nalepa and Bauer 2012) that lands perceived as marginal by the state and private investors often provide key sources of livelihoods for poor and marginalized rural communities. Thus, biofuel policy processes and direction should be informed and guided by the realization that dryland communal farming system in the study area has multiple production objectives, which are part of local ways of adapting to income stresses.

This study’s findings also demonstrate that political and private interests may underlie the seemingly noble shift towards biofuel production, which breeds winners and losers in emerging biofuel development projects (see also Shattuck 2009). In this case, the Government of Zimbabwe may have been especially keen to satisfy the needs of biofuel investors, because they are the few private investors that were prepared to sidestep international concerns about the country’s political problems (including a violent land reform program and a series of disputed elections). Thus, from a policy perspective, it is also important to understand the political configurations that shape pro-biofuel production arguments. Further, “the extent to which

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national policy legal frameworks provide adequate safeguards for local land and resource rights, and effective mechanisms for local participation in decision-making, will frame whether increased agricultural investments will translate into new opportunities or further marginalisation” of local communities (Vermeulen and Cotula 2010, 900). More powerful individuals and groups of people have greater access to resources such as irrigated land.

Given the negative impacts of biofuel development on local livelihoods highlighted in this study, a shift toward an inclusive business model, such as the inclusion of smallholder farmers as sugar-cane out-growers, may be a desirable policy objective. While the impacts of biofuel are variable according to the type of feedstock cultivated, experiences in Mexico have shown that smallholder farmers involved in feedstock cultivation, have not negatively impacted natural resources or other services customarily available to local people (Skutsch et al. 2011). In Brazil, inclusive business models have, in relative terms, yielded positive outcome and less people-state conflicts (Hultman et al. 2012). However, this is more likely achievable, with formal and legally binding agreements on social investments such as “benefit sharing, guaranteed resource access or other arrangements between the community and the investor” as suggested by Vermeulen and Cotula (2010, 909).

The questions facing biofuel development in the Global South, particularly about what should be incorporated in biofuel policies, are likely to multiply in the years ahead. These issues include local livelihoods impacts, land rights issues, the legal framework for biofuel development, politics and the state’s overall commitment toward balancing national strategic interests and local livelihood needs. Without an effort to address these challenges, land acquisition for biofuel production is likely to continue being predicated on the erroneous assumption that biofuel production on “marginal” or “underutilized” land will, in effect, yield benefits at both the national and local levels.

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