Large Scale Biofuel Projects in Mozambique: A Solution to Poverty?

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Chapter 1 Introduction

Recently there has been a large increase in global land acquisitions for fuel and food production (Borras et al 2011; OI 2011; Deininger 2011). This has been spurred on by the combined global food, fuel and financial crisis. Capitalists have been seeking out 'cheap' and what the investors and international development agencies term 'idle land' to occupy or lease. Large tracts of land are being allocated predominantly from developing nations such as Sub-Saharan Africa, Asia, Latin America and Eastern Europe – and in the majority of cases the land is not 'idle' at all (Borras et al 2011, 221). Several academics and NGOs have been critical of this global land phenomenon as they argue that this is a new form of imperialism, that has significant negative consequences for local populations (often the poor and marginalised) including displacement, marginalisation, conflict, increased resource competition and coercion (Oxfam 2008; De Shutter 2011; Giampietro and Kozo 2009; Li 2011; Borres et al 2011; Cotula & Vermeulen 2011). The large scale biofuel industry plays a significant role in this and has expanded rapidly in recent years, particularly in Mozambique. Biofuel promoters argue that through employment opportunities and rural development, large scale biofuel plantations will contribute to poverty alleviation (Murphy et al 2011; Mhamba & Thurlow 2010; Arent et al. 2009; Deininger 2011)

Aims and Scope

This thesis aims to examine whether developing nations such as Mozambique achieve poverty reduction through large scale biofuel projects. Large scale acquisitions for biofuel projects in developing nations, has become an important contemporary issue. Academic research from an agrarian political economy perspective

has been utilised however Harvey's Accumulation by Dispossession (ABD) concept as a framework for analysis has yet to be applied in the context of biofuels in Mozambique. The processes of ABD are highly relevant for analysing dispossession and the impacts on poverty. ABD is fundamental to the expansion and introduction of the biofuel industry. Through the process of ABD biofuel projects in Mozambique are shaping land change in rural communities and thereby impacting upon rural poverty, this research will seek to provide fresh insight into an industry that is new and expanding at an alarmingly rapid rate. This thesis will provide a highly detailed case study of Mozambique, which may be utilised comparatively with other developing nations. Knowledge of the nature of ABD will be expanded within the context of Mozambique to contribute to a gap in knowledge of its application in its various forms to country specific analysis. There is also need for continual up to date understanding and context specific knowledge in each developing nation in regards to biofuels and large scale land acquisitions in order to inform policy decisions of the future.

Research Methods and Limitations

This thesis will examine biofuels and poverty in rural Mozambique through the theoretical lens of ABD. The concept of ABD views dispossession as a contemporary process relied upon by capitalists to maintain the capitalist system. Four key characteristics of ABD will be drawn upon to provide the framework for analysis these include: displacement of peasants; commodification and privatisation of land; commodification of labour power; and suppression of alternative modes of production and consumption. The impacts of these processes on land and livelihoods, food security, compensation and wage labour will be explored. A limitation of this approach is that the cultural, social and political dimensions of poverty are not given adequate consideration due to the limited scope available. The research methods used to collect

the data presented include case study method, and contextual analysis. This will increase contextual understanding and knowledge; and increase the complexity of understanding within the geographical region. Case studies and contextual analysis provide a detailed, in-depth and nuanced understanding of a particular situation at a particular historical moment. Through the presentation of case studies this thesis expects to uncover new meanings and utilise previous ideas in new and insightful ways. Data was found through a variety of sources including primary sources such as: government research and documents, company websites; Mozambique newspapers; poverty and agrarian statistics from International aid agencies; secondary sources include academic research, International aid agency reports and research, and NGO reports and research. This research endeavours to rectify the limitations of case studies by providing a detailed table (appendix 1) that includes key information and data pertaining to a total of 20 biofuel projects in Mozambique.

Overview

The current literature and debates on land acquisitions for biofuels and poverty in the global context is outlined in Chapter 2. Chapter 3 will follow to outline the theoretical framework of agrarian political economy including a discussion of current literature that utilises the theoretical framework ABD. Chapter 4 with a focus on land will explore the ways that land distribution and ownership has changed since the emergence of large scale biofuel projects in Mozambique and how land change has impacted upon rural poverty. This chapter will also examine whether land displacement or dispossession has occurred as a result of biofuel production in Mozambique and whether the rural poor owned the land prior to the acquisition and whether they were adequately compensated. This chapter maps the history of land and agrarian change in Mozambique and presents detailed information gathered from primary and secondary

sources in regards to the current biofuel projects in Mozambique (see also the table on Biofuel Projects Appendix 1). Several case studies are also drawn upon to highlight the characteristics of dispossession and displacement.

In Chapter 5 on poverty the extent to which access to livelihoods are impacted by biofuel projects is examined. Two key factors for analysis emerge as important: access to employment and food security. This chapter examines whether the rural poor in Mozambique have experienced a decrease in food security as a result of large scale biofuel projects. The chapter commences by highlighting the importance of the context of Mozambique in terms of subsistence production to demonstrate the history of agrarian change and subsequent policies that have impacted upon food and agricultural production also shaping the current status of poverty. The impacts of biofuel projects on livelihoods are examined by viewing the changes in rural households access to livelihoods including livestock trails, forest resources, water and wage labour. Food security is argued as a key factor affecting poverty that biofuel projects directly impact upon. A case study is examined to highlight impacts on food production for households engaging in out grower schemes that promote the planting of food crops such as Cassava for sale to biofuel companies. The findings that have emerged from these Mozambique data chapters are then discussed at length in Chapter 6 Discussion, and conclusions drawn in Chapter 7. First this thesis will now turn to the current literature on biofuels and poverty reduction.

Chapter 2: Literature Review: Biofuels and Poverty Reduction

Recently there has been an influx in demand for land for large scale investments in the production of biofuels from developed countries seeking sustainable energy resources (Hanlon 2011, 5). Investors are acquiring land mostly from developing nations. Many promoters argue that biofuel land investments in developing nations are a solution to rural poverty. This literature review will outline the current issues and debates relating to biofuels and poverty reduction. The debates will be organised around the three key themes that have emerged whilst researching the literature including land change and displacement; employment; and food security. Firstly this review will provide background information around the emergence of the recent global rush for land for biofuels.

Background

Biodiesel or bioethanol is extracted from biomass to produce biofuel utilised most commonly for transport. Bioethanol is produced from crops such as cassava, sweet sorghum, and sugar cane. Biodiesel is produced from oil found in certain seeded plants, such as jatropha, palm, cassava, and soya (Margarida & Mota 2009, 1). There has been a recent rapid growth in biofuel projects, the industry increased three fold between the year 2000 and 2007, particularly in the developing world (FAO 2008, 5). Many developing countries have been identified as having vast tracts of available 'marginal' or 'idle' land estimated between 445 million and 1.7 billion (Deininger 2011, 223). The concept of 'idle land' is highly contested. Two global concerns have

led to the expansion of biofuels - diminishing peak oil levels and climate change which have driven the demand for renewable energy sources (Franco et al. 2010b). The European Union and the United States have recently introduced policy targets for the mandatory blending of biofuels (Franco et al. 2010b). Promoters also argue that biofuels are a part of the solution to rural poverty in developing nations. This thesis will critically examine this argument.

Land Change and Displacement

FIAN (2010, 24) researchers suggest that large scale land acquisition for biofuels restricts local control and access to key livelihood resources such as land and water. They argue that by reducing the ability for subsistence farmers to utilise resources this impacts directly on their right to an adequate standard of living even when compensation and relocation is guaranteed. Oxfam (2008) warn that displacement can cause conflict often involving the most marginalised populations. However promoters argue that the opportunities outweigh the risks. They argue that when governments implement biofuel strategies with guidelines and regulations in place,' pro poor' or 'win-win solutions' can result. For example the director of the International Food Policy Research Institute (IFPRI) Joachim von Braun argues that 'policy makers must take care to ensure that biofuel production is managed and regulated' to avoid socio-economic pitfalls. Another approach that biofuel promoters suggest to avoid the 'risks' involved in large scale biofuel projects is to allocate 'marginal' or 'idle' land to investors.

Murphy (et al 2011, 8) argue that biofuel production will play an important role in renewable energy in the next 40 years, particularly due to the range of land types available including marginal or idle land and forest land. However, when these terms

are used to classify land based on the premise that lands are unproductive or underutilised it is argued by several critics that the land can often hold significance for local populations for example as common property resources (CPRs), part of livestock trail, forest resources, or land held in reserve (Cotula et al 2009, 62). In addition to this De Schutter (2011, 250) argues that by assuming that 'idle' land is widely available and suitable the 'opportunity costs' from allocating large tracts of land to agri-business are underestimated. The benefits from promoting local access to land and water, and local farming technologies are thereby set aside. McMichael (2009b, 235) argues that by promoters focussing solely on commercial agricultural projects will reduce subsistence farmer's capacity to produce independently of the market. Borras & Franco (2010, 575) argue similarly that agro-industrial approaches undermine subsistent farmers livelihoods and economies – through the very act of dispossessing farmers of land which devalues their practices. Crop production on 'idle' or 'marginal' lands is also seen as a strategy to avoid undermining food production as 'marginal' lands are not used for cultivation (Borras & Franco 2010, 19).

Food Security

Promoters argue that by assessing land it is possible to find 'suitable' or 'marginal land' which will not compete with food production (FAO 2010, 38). However, Cotula & Vermeulen (2010, 903) in their study of biofuel projects in Sub-Saharan Africa found that in some case studies demonstrated that higher valued lands (with access to irrigation, markets and higher rainfalls) were the lands often allocated to investors. They argued that some projects have displaced farmers from land already in use by local people, yet these areas were unrecognised (Cotula & Vermeulen, 903). FIAN (2010, 25) highlight that many Sub Sahara African countries allocate land ownership and usage according to custom and tradition - several countries fail to

recognise this. Although, even where customary land rights are recognised, rural communities are increasingly dealing with displacement of land utilised for food production and livelihoods (FIAN 2010, 25). These common property or communal lands have been found to be utilised as a vital livelihood resource which is important for rural populations to maintain food security. Biofuel promoters often argue that any food security risks will be outweighed by the potential for economic growth (Mhamba & Thurlow 2010; Arent et al. 2009; Deininger 2011). On the other hand several critics argue that nearly all biofuel projects are for export, and will reduce rural areas to commercial-based technologies where poverty and hunger will be further exacerbated (McMichael 2009b, 239). However promoters argue that employment opportunities will generate incomes and strengthen local communities.

Employment

The most commonly promoted potential benefit of biofuel projects to the rural poor is that employment and small holder income increases will be high. Yet several critics of biofuels argue that employees face poor working conditions, substandard wages, minimal job creation, and have failed to translate into better living conditions (Giampietro and Kozom 2009; FIAN 2010, 26; Oxfam 2007). For example Fernandes et al. (2010, 801) in their study of peasants and biofuel agribusiness investors in the region of Pontal do Paranapanema in Sao Paulo, Brazil, it was found that yearly payments of family members of seasonal workers were spent quickly and that the work itself was extremely difficult and paid at an extremely low rate (Fernandes et al. 801). Other research has shown that employment generation has occurred with positive impacts on livelihoods. For example Schoneveld et al (2011, 10) in their study on the local impacts of biofuel plantations in Ghana found that employment was reported to have a positive impact on the livelihoods. However of the 67% of the employed,

farming remained most important to food security and income, employment income generation was secondary. They argue that 'these gains do not appear to accrue substantially to households that have been affected by land loss' (Schoneveld et al., 10). This suggests that employment gains only provide partial compensation for loss.

Critics argue that, increasing employment opportunities and labour productivity is not a viable approach to reducing poverty in developing countries (Giampietro and Kozo 2009). Li (2011) argues similarly and draws on research from Indonesia due to its extensive history of large scale land deals and contract schemes, to argue that certain skills will not transfer into the global capitalist system. She demonstrates that for many, displacement occurs as a result of land acquisition, with no alternative livelihood or pathway to employment. She argues that 'unless vast numbers of jobs are created, or a global basic income grant is devised to redistribute the wealth generated in highly productive but labor-displacing ventures, any program that robs rural people of their foothold on the land must be firmly rejected' (2011, 281).

The global land grab phenomenon, of which biofuels production is very much a part, involves many actors with various interests and viewpoints. For example, Biofuel promoters argue that through employment generation and investment in rural development biofuel projects will result in a reduction of poverty for developing nations. On the other hand the critics point toward evidence of land displacement, food insecurity and poor working conditions that could worsen situations of poverty. There is a debate emerging in regards to whether large scale biofuel projects can reduce poverty. However, more country specific and academically rigorous research is required to examine more closely the impacts of biofuel projects on the rural poor in developing nations. Particularly in high impact areas has sub-Saharan Africa. This thesis aims to contribute to this important and growing literature.

Chapter Three: Theoretical Framework

This section will introduce the political economy of agrarian change and the concept of Accumulation by Dispossession (ABD) as the theoretical framework chosen to address the research question. An increasingly common feature of biofuel projects is that of dispossession of small scale farmers land, and access to livelihoods. Minimal research has been done on the character and impacts of ABD in the context of the recent rush for land for large scale biofuel projects in Sub-Saharan Africa. ABD is yet to be applied in the context of Mozambique. This section will commence with a summary of agrarian political economy in particular the concepts of primitive accumulation and ABD. The process and impacts of ABD on land and livelihoods will be outlined as a methodological framework for analysing the implications for poverty as a result of biofuel projects in rural Mozambique.

Political Economy of Agrarian Change

Political economy of agrarian change evolved from a Marxian political economy and provides an analytical framework for critiquing capitalism in the particularly in the developing world. The key shifts in agrarian change range from the transition of feudalism in Europe to capitalism, widespread colonisation, to the formation of the world into a global economy during industrial capitalism, and the current neoliberal era of globalisation (Bernstein 2011, 4). During this capitalist development the social nature of small-scale farming changes, farmers become petty commodity producers and they commence integration into larger emerging divisions of labour and markets leading to an incorporation into regional and global markets and dependence on them for consumption (Bernstein, 4). This process, Marx suggested, was

a precursor to capitalism. He used the term primitive accumulation to describe the originating processes of capitalism (Harvey 2003).

Primitive Accumulation and Accumulation by Dispossession (ABD)

Marx argued that there are two types of accumulation: primitive and capitalist accumulation. Primitive accumulation described the originating processes of capitalism; he argued that this process required the appropriation of resources, which resulted in the dispossession of those living on the land, and the appropriation of their labour power (Adnan 2012, 2). This separates peasants from pre-capitalist means of production (Adnan, 2). This process remains present today to maintain capitalism, as many of the characteristics of 'primitive accumulation' are present with the global rush for land (Bernstein 2011; Harvey 2003). Harvey argues that Marx's theory of primitive accumulation requires reworking and revisiting. ABD is Harvey's attempt at this. ABD describes a process that now assists to maintain Capitalism. It is different from capitalist accumulation as it involves appropriation of natural resources, and the displacement of non-capitalist populations. Harvey argues that capitalism must create new spaces to access cheaper inputs such as land, raw materials and labour power (Harvey 2003, 139). Bush et al (2011, 187) argue that this is currently occurring in sub-Saharan Africa at an alarming rate, which also stems from a global and capitalist crisis of fuel, food and finance: the global economy is becoming dependant on African land. The land transformation is shaping and impacting significantly upon peasant farmers (Bush et al, 187). There are several key characteristics of ABD, including the process of removal and / or displacement of peasants.

Removal and/or displacement of peasants

Marx argues that primitive accumulation involves acquiring land, enclosing it and removing the local population in order to create a landless proletariat. This requires the forcible displacement or removal of peasants from land and / or access to resources. Adnan (2012, 4) argues that contemporary ABD involves reducing the access of peasants to common property or open access resources such as forests, livestock trails and water (Adnan, 4). Removal can involve physical displacement of households, which result in relocation (often to less fertile or more marginal land), landlessness or migration. It can also involve restriction of access to key resources such as water and fertile soil. Acquisition of land and resources directly impacts local population's means of production and labour power, undermining local capacity for subsistence living, and increasing dependency on the market (Adnan, 5). Bush (et al 2011) argues that ABD is at the heart of contemporary struggles over access to land in Africa. Privatisation of land is another process of ABD which allows land to become a commodity through which capital can circulate.

Privatisation and commodification of land

An important part of the process of ABD is commodification and privatisation of land. Land becomes a commodity, and a means through which capital circulates (Harvey 2003). This involves the appropriation of resources and the conversion of common property rights into private property rights. Harvey (2003) suggests that capitalism always requires a pool of available assets to avoid the problem of over-accumulation this occurs through the continual commodification of land in developing countries. Bush et al (2011) argues that the commodification of land and resources through dispossession is occurring at an alarming rate in Sub Saharan Africa. The assumption underlying and justifying the position of global financial institutions and

transnational corporations is that Africa has abundant amounts of 'idle' or available land (Bush et al, 187). A consequence of classifying certain land as 'unproductive' or 'idle' often results in the commodification of 'common property' lands. Once deemed available through this process land then legitimately turns into a commodity for capitalist appropriation. Often ownership changes hands in the process of accumulation whereby, the capitalist appropriates land or property. Ownership and control over land even when the most progressive land laws are in place is negotiable, with the power placed in the hands of the investor (Cortula & Vermeulen 2010, 913). Commodification and appropriation of land does not necessarily result in direct land displacement it can also involve reduced access to other resources (Hall 2011).The commodification of labour power is also a characteristic of ABD.

Commodification of labour power

The commodification of labour was also referred to by Marx as a process of primitive accumulation. Through the process of dispossession, rural populations must give up their labour power in return for a wage; this creates an enclosure of property-less labour (Harvey 2003). Marx saw the state as an important apparatus in supporting this process through extra-economic coercion and legal action (Harvey 2003). With contemporary ABD this continues as capitalists seek out non-capitalist territories 'to invest in profitable ventures using cheaper labour power, raw materials and low-cost land' (Harvey, 139). Capitalism can utilise its power to induce unemployment, and create an 'industrial reserve army' of workers who must submit to lower wage rates creating a more profitable environment. Harvey argues 'capitalism necessarily and always creates its own 'other'' (Harvey 141). Bush et al (2011, 191) argue that the current rush for land will create or recreate enclaves consisting of capital intensive production and high surpluses of labour. They argue in the context of Sub-Saharan

Africa that ABD is creating a partial transformation of local smallholder farmers into workers separated from the means of rural existence. Three types of labour regimes are involved: local wage labour, imported wage labour and out growers (Hall 2011, 203). Rapid rural proletarianisation is required for the transformation from independent farming producer to contract famer or labourer which involves the suppression of alternative modes of production and consumption.

Suppression of Alternative Modes of Production and Consumption

Marx refers to the suppression of alternative modes of production and consumption as a key characteristic of primitive accumulation (Harvey 2003, 143). This involves coercions and appropriations of pre capitalist knowledges, skills, social relations, and practices and beliefs (Harvey 146). Harvey argues that in contemporary ABD peasants are more likely to be co-opted than violently coerced into the rural proletariat. A struggle emerges during this process and often aspects of pre-capitalist practices endure and the extent to which suppression occurs is distinctive geographically and historically (Harvey, 143). Hall (2011, 208) argues that dispossession involves adverse incorporation rather than exclusion 'of small holder agriculture into new value chains, patterns of accumulation and wider transformations in agrarian structure and agro-food systems that precipitate'. Resources crucial to sustain livelihoods are therefore threatened. Alternative modes of production are further suppressed by donors that view the modernisation of rural populations as a way out of poverty (Bush et al, 191). With the recent land rush there has been an incorporation of African agriculture into global markets much faster than in the past (Bush et al, 191). It is important to explore the impacts of the key processes of ABD on access to land and livelihoods and the implications this has for rural poverty.

Land and Livelihoods

Land and livelihoods are key factors to ensuring poverty reduction. A livelihood comprises of 'capabilities, assets (including both material and social resources) and activities for a means of living' (Chambers & Conway 1992 in Scoones 2009, 5). Rural populations utilise a variety of livelihood strategies that require the input of a range of resources for sustaining livelihoods such as fertile land, forests, livestock trails, water, and wage labour. Several agrarian political economy theorists have found that land and livelihoods have been impacted by ABD (Bush 2011; Borras et al 2006; Hall et al 2011). Access to land is vital in rural developing nations to overcome the challenges of poverty: threatened access can therefore have negative impacts on poverty.

Effective control over productive resources such as land is crucial for maintaining a diverse rural livelihood during vulnerable times, and plays a significant role in overcoming poverty, particularly in sub-Saharan Africa, as incomes are mostly derived from farming even though livelihood diversification has increased (Borras et al. 2006, 1). Bush et al (2011, 190) argue that many donors and governments take the view that modernisation of rural populations (engaging in wider markets) and urbanisation is a pathway out of poverty, even when this involves land and resource dispossession. This view undermines current rural livelihood strategies, and therefore devalues the importance of access to these resources. Retaining access is threatened by the scramble for Africa's land which is shaped by processes of contemporary capitalism such as ABD. This thesis will examine the extent to which ABD impacts on access to land and the implications for poverty in rural Mozambique.

Land use change and Reform

ABD of the rural poor will invariably involve land use change. Land reform has the potential to remove or allow usage or control over key land and livelihood resources, it is often an approach adopted by governments to ensure access rights for rural populations (Borras et al 2010, 23). However, even land reform beneficiaries are suffering from dispossession or displacement - particularly when promised improved access to livelihoods and employment opportunities and in the worst case scenario when coerced or threatened to leave the land. There are two types of land use change relevant for biofuels (Borras and Franco, 23). Type B indicates change of land use from food production (for consumption or domestic exchange) into biofuel production for (domestic market or export). Type D indicates forest or 'idle land' cleared for biofuel production. These categories are useful for analysing the different land use change in Mozambique as a result of ABD and the implications for poverty. This is particularly useful when exploring the implications of ABD on food security.

Food Security

The systematic suppression and incorporation of rural small scale agriculture and livelihoods also impacts upon subsistence food production. There are several ways that biofuel projects through the process of ABD can threaten or impact upon food security. Thompson (2011, 516) highlights that food security may be negatively impacted upon when change in land use moves from household production food for consumption, to monocrop or outgrower schemes run by companies, which use staple food crops with the intention of converting to biofuels. Mono-crop plantations often require large quantities of water, and large tracts of land necessary for high yields. Thompson (516) also argues that the implication of biofuel production on African land

is loss of food security as biofuel crops compete with food crops for consumption for land and resources. Food security is also threatened when access to key livelihood resources are removed or threatened such as agricultural land for subsistence farming, grazing lands for cattle, water, and forest food products is reduced or removed. Food security is only one dimension of poverty that is impacted by ABD. Increased access to livelihoods such as wage labour and compensation is often argued to be beneficial impacts of ABD on poverty.

Compensation and Wage Labour

Through compensation deals during consultation outcomes for the poor can sometimes be negotiated. Increased access to an alternative livelihood such as wage labour, and improved services are the most common promises made by companies in return for control over land. Li (2011, 283) argues however that investors make their exceptionally large profits from ensuring access to low cost land and labour. This is the standard result of agricultural capitalism. Therefore significant profits do not remain in the local areas. Li (2011) argues that wage employment is often inadequate in terms of compensation for land as it has minimal benefit for rural populations and small holders make comparatively more income than wage earners. She argues that poverty reduction through compensation deals is not a company's primary concern (Li, 283). She argues it is unlikely that adequate numbers of jobs will be provided to lift rural populations out of poverty, partly due to the development of agri-business technology which requires less labour. Cotula & Vermeulen (2010, 914) argue that biofuel agribusiness projects can often provide insecure, short term and unskilled roles. Over a longer period – biofuel investments may cause uneven land distribution and local populations will become tied to international markets (Cotula & Vermeulen, 914).

Poverty

Access to livelihood resources is essential to overcoming poverty. All of the above impacts combined have significant implications on poverty. It is hypothesised that by reducing or removing access to livelihoods through the process of ABD will result in negative impacts on poverty. The concept of ABD which unpacks the varied and interlinking processes such as the removal or displacement of peasants; commodification of land; commodification of labour power and the suppression of alternative modes of production and consumption will be applied in the context of biofuels in rural Mozambique to assess the impacts on poverty. ABD is fundamental to the expansion and introduction of the biofuel industry in Mozambique. The method will be to examine in particular the impacts of ABD on access to livelihoods and the implications this has poverty. A particular focus is taken on food security, as maintaining food security is deemed an essential factor in overcoming poverty. For the status of food security to remain stable for rural populations such as in Mozambique access to livelihoods (such as agricultural land, forests, livestock trails and wage labour) is imperative. This thesis will gather data and present through the application of the following research methods: case study and contextual analysis, to provide a nuanced and rich understanding of a range of occurrences of ABD in rural Mozambique.

Chapter 4 Biofuels in Mozambique: Land

This chapter examines whether ownership and control over land has changed since the emergence of large scale biofuel projects in Mozambique, and has this land change impacted upon rural poverty. The chapter presents the Mozambique context of agrarian change, and demonstrates how the history of the political economy of agrarian change, demonstrates a past of attempted capitalist transition from the colonialist period until the current environment of neoliberal approaches to development that encourage foreign investment and large scale agriculture. The process for acquiring land, including a detail summary of the Mozambique Land Law 1997, as well a detailed summary of key information gathered from the table of current biofuel projects (See appendix 1). The data gathered in the table came from a range of primary and secondary sources and provides insight into the types of projects, amount of land allocated, company details, location, consultation and impact on local communities. The avenues for acquiring land are also outlined. The extent to which land displacement has occurred as a result of large scale biofuel production in Mozambique, and whether the rural poor have been adequately compensated is explored. Two distinct case studies are presented in depth to demonstrate some of the key characteristics of dispossession arising from large scale biofuel land projects in Mozambique such as land displacement, increased land scarcity, poor consultation, and poor delivery of socio-economic improvements for the local communities on the part of the investors. First the key shifts of agrarian change with a focus on land in Mozambique.

History of Land Change Mozambique

The colonial era saw widespread control over land, resources and labour particularly from the late 19th century onwards (Hanlon 2011, 8). The northern regions were controlled by British and French foreign capitalists, the south by South African miners and the rest of the land by the Portuguese colonialists (Vail et al 1979, 245). Some of the population were displaced and many migrated to avoid forced labour and forced production of goods and services for the colony (Tanner 2002, 4). Little of the wealth accumulated by the exploitation of land and resources by the colonialists and foreign capitalists was reinvested in Mozambique. (Vail et al, 247). The colonialists and foreign capitalists control over land did little to improve the lives of the rural poor, it encroached upon their access and power over land, often displacing farmers and reducing them to small plots of land and encouraged cash cropping (Vail et al 1979, 247). During Independence the land became state controlled and local farmers were integrated into large agricultural estates, which undermined smallholder agriculture (Henriksen 1978, 443). During the warfare period when white led Rhodesian guerrillas wreaked havoc on the country side mass migration and internal displacement resulted (Dinerman 2008, 2). There was conflict over ownership of land occurred after war ceased and rural populations returned (Tanner 2002, 4). Customary law assisted resettlement however some land was occupied by foreign investors which led more conflict and to the development of the Land Law of 1997 (Hanlon 2011, 11). The current Mozambique government's approach to development is reflective of a global neoliberal approach with policies that opens up markets and encourages foreign investment, land is therefore becoming in higher demand (Plank 1993, 411).

Section 1 Land Use Change and Control

This section will outline the trends in land use change in relation to large scale agribusiness for biofuel production. The process of acquiring land through the Mozambique Land Law of 1997 is detailed. The Mozambique's biofuel strategy will also be outlined – it is the framework that the government utilises to promote foreign and national investment in the biofuel industry, and is an important driver of the growing biofuel industry that in Mozambique. This section also includes a detailed table of the current biofuel projects in Mozambique.

1.1 Land Use Mozambique

Mozambique is predominately an agrarian society, 69.2 per cent of the Mozambique population live in rural areas, and 80 per cent of labour is found in agricultural practices – a key source of livelihood, small holder farming is the most common (FAO 2012b). Each household has an average of 1.1 hectares. Traditional farming methods are utilised such as manual, rain fed and shifting cultivation to stimulate soil (Hanlon 2011, 12). The allocation of large tracts of land by the government to private investment since the 1980s caused the agrarian structure to currently consist of many large plots of land juxtaposed with many small plots of land. Intermediate sized plots of land are almost non-existent (USAID 2007, 1). Many families are poor, and land insecure. The small holder agricultural sector is poorly supported: limited access to finance, support services, transport and storage facilities, technologies, seeds and fertilizers (IFAD 2011, 2). The presence of agribusiness continues to increase consisting of capital-intensive mega projects utilising sophisticated technology and agricultural inputs, with access to large amounts of credit, irrigation and substantial tax holidays (OECD 2011, 387). Production is mainly for

export to national or international markets which provides 'few spill over effects on the rest of the economy, in terms of either job creation or tax revenue' (OECD 2011, 387). All land ownership and usage is governed by the Mozambique Land Law 1997.

1.2 Land Law 1997

The Mozambique Land Law of 1997 states that land is the property of the state. It aims to support Mozambique's emerging market economy whilst protecting the customary rights of small holder farmers (Kanji et al 2005, 9). Land use rights are acquired through an allocation of a DUAT (Direito de Uso e Aproveitamento dos Terras) (Schut et al 2010b, 7). There are three ways of acquiring a DUAT. The first is through occupation based on customary norms and practices that acknowledge ownership based a DUAT can be issued based on a history of traditional allocation and usage, if shown to exist legal protection is given (Schut et al 2010, 7; Tanner 2002, 27). A local community can hold a single state DUAT in its name and is responsible for management of land and resource access and maintenance, on the basis that these practices are informed through the customary system (Norfolk and Tanner 2007, 2). It is deemed unnecessary by the government that the land rights be formally registered. Therefore protecting these rights in practice can be problematic. The second pathway to acquire rights to land is through occupation 'in good faith' for both individuals or groups that occupied uncontested land for at least 10 years – this assists those with de facto occupation who were displaced from customary lands during the colonial and post-independence war period (Tanner 2002, 27). The third avenue is for new requests for land rights formally through the state most commonly used by investors, which can only be obtained with proof of community consultation. The land title is inheritable and

transferable, in the form of a 50 year renewable long term land title. It is not ownership and is available (legally) to all Mozambicans (Schut et al 2010b, 7).

1.3 DUAT for Investors

If the land requested is occupied, investors must conduct community consultations and present compensation conditions, and submit a project plan – with a two year probationary period (Norfolk and Tanner 2007, 5). Nhantumbo & Salomao (2010, 14) argue this legal requirement is often poorly enforced, due to limited capacity and the political and economic power of investors over decision making. Land is granted at the provincial level unless the project is over 1,000 ha – then the authorisation is required at a national level. However for over 10,000 ha approval must be obtained from the Council of Ministers in Cabinet (Kanji et al 2005, 9). The land law recognises that constructions made by the DUAT holders are owned by them, these assets can be sold, the DUAT is formally transferred to the new owner (Norfolk and Tanner, 5). Effectively the land is transferred along with the asset, therefore land use and ownership can change without government approval or community consultation.

The Mozambique land registry is incomplete, in part due to DUATs by customary or in 'good faith' occupation not requiring official demarcation for recognition of rights – therefore official maps have gaps which are more able to be expropriated (Norfolk and Tanner 2007). The World Bank (2011, 61) reported in 2011 that only 12 per cent of communities have had their land demarcated. By examining Mozambique inventory data the authors found 418 cases of commercial investor land allocation has overlapped with previous community land. Community land registration fees are too high for smallholder farmers. NGO's or donor agencies often assist. This is a barrier to formal registration of land for poor communities (Kanji et al 2005, 14).

Although the 1997 Land Law in Mozambique has been hailed a progressive land system that recognises customary rights, there has been critique of its effectiveness in practice (Kanji et al, 9). The Provincial Cadastral Service (SPGC) has been criticised for not adequately consulting the community, in regards to information given and representatives chosen for consultation – community elites. Kanji et al (9) argue that 'the registration of rights under the law is still highly problematic as it does bring into direct conflict the interests of different groups including smallholders, urban elites and foreign investors'.

Section 2: Biofuel Projects Mozambique

This section will present information in regards to current biofuel projects in Mozambique. The government's current biofuel strategy will be outlined. Details of the current biofuel projects will be presented based on information gathered and presented in Appendix Table of Biofuel Projects Mozambique. Two key case studies that outline the characteristics of displacement are also presented.

2.1 Mozambique's Biofuel Strategy and Global Partnerships

Mozambique has recently become the leading African biofuel producer, viewed as having the potential to rival Brazil. 'Since mid-2008, the government of Mozambique has pending use right requests for more than 12 million ha, with nearly all of the requests relating to biofuels' (Peters 2000, 1). Brazil and the EU under the partnership titled 'Sustainable Development of Bioenergy' are assisting Mozambique to develop a large 'sustainable' biofuels industry (Franco et al, 9). They anticipate that African biofuels will incur minimal tariffs – creating a competitive market. Brazilian

biofuels producers aim to capitalise on these new production locations and the EU also as it has set a 20 per-cent renewable energy target for 2020 (Reuters Africa 2010).

The Mozambique government released its biofuel policy strategy in 2009 (Mitchell 2011, 137). The study that informed the framework of the policy was funded by the World Bank and the Italian embassy (Mitchell, 138). Regions in Mozambique indicated suitable based on favourable agricultural conditions and water resources. The projected benefit of the industry is increased revenue and employment generation. The report also indicated the socio-economic risks of large scale biofuel production in relation to food security and the rural population's access to land (Nhantumbo & Salomao 2010, 18). To reconcile these issues the study recommended that biofuel projects be undertaken on land that is deemed 'marginal' to prevent competition for land usage for food crops. The government ceased all large scale land concessions in 2009 due to land displacement and conflict – in order to map the land. 3.8 million hectares were deemed adequate for agriculture, livestock and forestry, biofuel investments resumed (Mitchell, 138).

2.2 Overview Current Biofuel Projects

The research presented in the Table for Biofuel Projects Mozambique (see Appendix 1), was developed by utilising a variety of primary and secondary sources. The key sources for the information gathered include African and Mozambican newspapers, biofuel company websites, Mozambique government documents, academic sources and NGO reports. Information on a total of 20 large-scale biofuel projects of above 1,000 hectares in rural Mozambique was found. Two biofuel projects that are not company run large scale plantations are also included in this table to highlight some of the differences between large scale plantations and out-grower

schemes or small scale projects. These include an NGO community based project for local exchange, and a company-led out grower scheme for the domestic urban market. The total land acquired equals 589,268 hectares. Most projects are not yet in full operation and are therefore not yet utilising the whole hectares allocated. Overall the projects are relatively evenly spread throughout the country. The central provinces Sofala, Inhambane and Manica share between them 7 projects. Jatropha is the main crop planted in Mozambique for biofuels, it produces biodiesel. 14 projects are cultivating Jatropha plants. Sugar Cane is also common with 4 projects utilising sugar cane for bioethanol production. Other plants cultivated include sweet sorghum, cassava, soy, sunflower, coconut and palm oil.

There was an influx of projects commencing between the years of 2007 and 2009. Almost all of the current projects commenced during this period. This corresponds with the government's decision to hold off on large scale biofuel projects until mapping of available land was completed, and a biofuel strategy was developed. Since 2009 expansion is occurring in two ways. The first is expansion through current projects requesting additional land. The second is new projects that include 'sustainability' and 'pro-poor' approaches, such as the out grower scheme by Clean Star Ventures that commenced in 2012, and intends on supplying the domestic market rather than export. Ownership is wide and varied with interests from many regions throughout the world. The most common investors are from the UK, Portugal, Brazil, Italy and South Africa. Nearly all projects are predominately producing biofuels for export. Most projects intend on producing at least 10% for the domestic market.

At least 14 projects were required to utilise consultation which would indicate that the project required displacement and reduction of access to resources from local farmers. Consultation seems to occur more often than not, however it appears to be

poorly conducted in several instances. Issues that stand out include consultation that has occurred with local elites rather than all impacted community members. Consultation appears to involve only one or two meetings with community members. However in most cases there has been little conflict. Two projects obtained land titles through the purchasing of infrastructure from the previous DUAT holder, which legally requires no consultation. Also in several cases promises made by companies for improving social infrastructure and creating jobs have not been followed through most often due to financial reasons.

Six projects have been reported as a having financial problems. Four of these projects involved the sacking of large numbers of plantation workers. In three cases there were issues with wages not being paid for significant amounts of time for example one company had to pay 4.5 million meticais to workers when two months in wages held in arrears and redundancy packages were given to 297 workers who lost their jobs. As a result the 6 projects have failed to adequately fulfil compensation promises in the form of employment, and infrastructure. At least 3 projects are known to be on schedule with the project plans. Information in regards to the total amount of households displaced from each biofuel projects is unavailable in full. However, case study examples can provide insights into some of the characteristics of displacement and dispossession in Mozambique.

2.3 Land Dispossession and Displacement

The characteristics of dispossession and displacement in Mozambique are highlighted through two key case studies of biofuel projects in Mozambique. The biofuel project ProCana in the Massinger District, and the biofuel project run by the Quifel Company will be examined as case studies. These projects highlight the impacts

of dispossession and displacement on the livelihoods of local people such as land displacement, increased land scarcity, poor consultation, and poor delivery of socio-economic improvements for the local communities on the part of the investors.

2.4 Case Study ProCana

The ProCana Project to plant sugarcane for ethanol was approved in 2007 in the Massinger district. The London Central African Mining and Exploration Company (CAMEC) received a DUAT for 30,000 ha for a 50 year lease, renewable. The company planned to cultivate 30,000 hectares contiguously, and promised to provide 7000 jobs in full operation. 60% of the land for crop production, and 40% for processing, irrigation, warehouses, school, health facility and workers residence (Nhantumbo & Salomao, 8).The Massinger district where ProCana was granted land, has a population of 28,470 people, the district land covers a total of 589,300 ha with 3,500 small holder farms of less than 2 hectare plots each (Nhantumbo & Salomao, 17). Massinger district has a higher rainfall than most parts of Gaza which tend to be dry and subject to drought, and the nearby Massinger dam was expanded in 2006 (Borras et al 2011, 222). The project was situated near a key provincial highway.

Households with customary rights over the land were relocated (Ribeiro and Matavel 2009, 10). Three important economic agricultural strategies were employed by these households - livestock rearing, subsistence farming and charcoal production (Borras et al 2011, 222). A serious problem arose when the Company found that the land they were allocated was land promised to a group of inhabitants of the Limpopo National park, who had been relocated from National Park lands (Ribeiro and Matavel, 10). Consultation was conducted in five affected communities, which the estimated population had totalled 360 families (Borras et al 2011, 225). Many researchers have

found that in regards to the ProCana case, not all households were consulted that the main consultation occurred between the CAMEC Company and local elders and elites. Disadvantaged groups in the community were not consulted (World Bank 2011, 65; Franco et al 2010, 33). The discussion during consultation was over relocation, rather than seeking approval for the project or considering the communities views on compensation (Borras et al, 228). The project was eventually abandoned by investors in 2009 and the government named it void for not complying with project obligations (Schut et al 2010, 87).

2.5 Case Study: Quifel Zambezia

The Portuguese Company Quifel received a DUAT for 10,000 hectares for a large scale biofuel plantation project in Lioma, northern Zambezia (Hanlon 2011, 43). There was conflict between small holder commercial farmers that were using 490 hectares of the land as a part of a project set up by CLUSA in 2003. The Quifel Company evicted 244 farmers that were growing soya for local chicken farmers (Hanlon 2011, 43). The project had assisted 5,000 farmers in the district to cultivate soybeans for local chicken producers, with 100 local rural associations managing the distribution. The farmers were an essential part of the local food value chain, which enabled local chickens to replace imported frozen chickens (Hanlon & Norfolk 2012, 5). The initiative had also been deemed successful in improving the welfare of smallholder households in northern Zambezia (De Vletter 2004, 2).

The CLUSA Project continued despite the approval of Quifel, as there had been no progress. The farmers of the CLUSA project began ploughing in September 2010, however in December Quifel ploughed 500 ha with the anticipation of a visit from the governor (Hanlon & Norfolk 2012, 6). 40ha of that land had been cleared previously by

local farmers from the Clusa project and some had planted maize. The Company had promised to build a school, health post, wells, and the extension of the electricity grid by the 2nd year of operation (Hanlon & Norfolk, 6). Quifel also projected that 600 permanent jobs would be in place by the 3rd year. However Quifel had made no progress and appeared to be in breach of its agreement (Hanlon & Norfolk, 6). Many were dispossessed of their land, without adequate land relocation or compensation.

Consultation involved two meetings on the same day, 550 people attended. The company made promises to create job opportunities and to set up an out-grower scheme on 2,500 hectares of the land (Hanlon 2011, 43). The researchers found during their field interviews that many soy farmers did not attend the consultation and their views and land rights were disregarded (Hanlon, 43). In November of 2011 the Gurue District Administrator wrote a letter informing the Provincial Governor that they had found Quifel to be in breach of its land title for not providing the promised amount of jobs or adequate relocation, he recommended the project be shut down (Hanlon & Norfolk 2012, 11). The land is currently still in the hands of the Quifel company.

Conclusion

This chapter addresses two key questions. The first question examined is how land distribution and ownership has changed since the emergence of large scale biofuel projects in Mozambique and the impact this has on poverty alleviation. Land ownership and distribution consists of lots of small plots of land beside large commercial plots, as a result of the history of agrarian change in Mozambique. It has been shaped and controlled by the colonialist government regulations and foreign investors land usage and then by state led farm initiatives and has often disregarded peasant subsistence land needs and customary rights, which has reduced control and

access which is fundamental to maintaining livelihoods and therefore has shaped the current status of poverty in Mozambique. Mozambique Land Law of 1997 is seen by many as progressive however this thesis found that the Land Law in practice does not always adequately ensure the protection of local farmers. The second question looked at land displacement and compensation as a result of large scale bio-fuel production in Mozambique. Many biofuel projects have encroached on the land of local farmers. Physical displacement and dispossession continues in Mozambique. This chapter has highlighted that although projects have the potential to increase wage labour opportunities the negative impacts as a result of land use change has occurred such as displacing farmers, increasing land scarcity and poor consultation in regards to relocation and compensation. These impacts are not contributing positively to the goal of poverty alleviation in the impacted areas in rural Mozambique.

Chapter 5 Biofuels in Mozambique: Poverty

This chapter will examine the impacts of large scale biofuel projects on poverty in the context of rural Mozambique by focusing on livelihoods and food security. First this chapter will outline the history of Mozambique which highlights how governments and investors took measures to restrict small scale subsistence practices shaping the current status of poverty in Mozambique. Section one will present the impacts of biofuel projects on rural households access to livelihoods including livestock trails, forest resources, water and wage labour. Access to land is also important, and is outlined in the previous land chapter. Subsistence farming plays an important role in lessening the impact of poverty, by reducing the vulnerability to food insecurity and contributing to livelihoods (Baiphethi and Jacobs 2010, 459). Therefore maintaining access to livelihoods and ensuring food security is integral to overcoming poverty (Maxwell and Smith 1992, 8). Section two examines the impacts of biofuel projects on food security. A case study is utilised to examine these impacts in the Bilene district, finding that household systems are impacted. Another case study examines the possible impacts on food production for households entering into arrangements with companies to grow staple food products for the production of biofuels. First, the historical context will be outlined.

Historical Context: Poverty

Prior to the arrival of the colonialist's Bantu populations utilised agricultural and iron making practices (Kaplan et al 1977, 13). The colonialists were interested in local African labour, they implemented compulsory labour regulations to mobilize for foreign investor commercial enterprises and settler farms. African agricultural practices

and food production were systematically suppressed through colonialist's policies in regards to export taxes and trade, as a result agricultural based production levels declined (Bowen 2000, 1; Vail et al 1979, 250). In the 1930s compulsory cotton and rice schemes were introduced, causing many to face food shortages as workers were forced to spend most of their time on these crops and household food production reduced (Isaacman, 594). The livelihood strategies adopted during this time included a mixture of small-scale production or cash crops for subsistence or reproduction, and wage labour for income. Peasant agricultural practices were also neglected by the new government after Independence with the commencement of large cooperative state farms (Bowen, 2). Foreign investors and settlers abandoned their productions during this time and the warfare period rural infrastructure and state farms were attacked, peasant farming was therefore impacted. Currently Mozambique subscribes to a neo-liberal approach to development, which prioritises large scale land investments over small scale agricultural services. Mozambique remains one of the poorest countries in the world; it ranks at 184 out of 187 countries in the UNDP Human Development Index (UNDP 2011). 54.7% of the Mozambique population continues to live below the poverty line (World Bank 2010). The life expectancy at birth for the Mozambique population sits at 50 years which is 4 years below the average life expectancy of the Sub Saharan African region. Inequality in Mozambique remains stagnant at 0.41 for the 2008-09 period, increasing by .01 since 1996-97.

Each period has brought some unfavourable consequences for small holders such as forced wage labour; forced cash cropping of commodities such as cotton which caused food shortages for farmers; collective farms which undermined African farmers diverse local production systems; and the continual threat of loss of access and control

over livelihood. It has contributed to the current livelihood practices as seen in the neo-liberal era of development which were adopted in the as combined livelihood strategies to ward off poverty such as subsistence farming, wage labour, and cash crops. The extent to which the rapid growth of large scale biofuel projects have on access to these livelihood strategies will now be examined.

Section 1 Access to Livelihoods

It has been claimed that large scale biofuel projects can threaten rural livelihoods and dispossess the poor of access to resources, when they are faced with competing directly with agribusiness for important livelihood resources such as fertile soil, water, forests and grazing land (Oxfam 2008; FIAN 2010, 24).However biofuel projects can also increase access to some resources such as water, services, skills training, and wage labour (Arndt et al 2009, 7). This section will provide insights from several research findings of a variety of projects in Mozambique by examining individually the following livelihood resources – livestock herding, forest resources, water and labour. Access to land is highly important, and hence the previous chapter is solely dedicated to land.

1.1 Livestock trails / herding

Livestock production plays an important role in the livelihoods of rural populations – mainly consisting of rearing chickens, pigs and goats and is most common in northern and central Mozambique. Reduced access to livestock herding trails as a result of large scale biofuel projects has been a concern. Often livestock trails pass through lands where little or no crop cultivation occurs. In land mapping exercises in Mozambique these areas of land have often been measured as ‘idle’ or ‘marginal’

land (Franco et al, 33). The land is subsequently deemed available to investors for land claims. In the case of ProCana livestock herders were relocated and they no longer had access to traditional grazing routes utilised for decades: new routes and boundaries were needed (Nhantumbo and Salomao 2010, 27). The ProCana project resulted in some herders relinquishing traditional practices and adopting semi-sedentary practices (Franco et al 2010, 33). In consultation meetings with Tihovene, Chinhangane and Banga communities the company had agreed to build water tanks for cattle drinking (Nhantumbo and Salomao, 38). However progress on this did not occur. Livestock rearing is one of many livelihood strategies utilised in Mozambique. When land seen as unproductive and classified as 'idle' it is likely that many more access to traditional grazing and livestock trails will be threatened. Mozambique also has a lot of land covered in forest.

1.2 Forest resources

For many farmers in Mozambique the forest is utilised for charcoal production as an additional and for many a key source of income. For example 1,552 forest licences were issued for charcoal production in 2005 (Nhancale et al, 7). Communities have also developed forest based enterprises utilising timber, beams, twine, honey, grass, bamboo, forest foods and traditional alcoholic beverage distilling (Nhancale et al 7), which supplement their existing livelihood strategies. Access can be reduced when forest land is cleared for biofuel projects. For example the German Company Elaion was granted 1,000 ha in 2007 in the poor district of Dongo in Sofala province where populations are vulnerable to food insecurity due to poor climate, high food prices, and reduced livelihood resources (Nhantumbo and Salomao 2010, 10). The community gave up their forest land utilised by charcoal producers to see a reduction in poverty through increased employment. However after realising the soil quality was not fertile

enough the company commenced predominately a forestry enterprise instead (Nhantumbo and Salomao, 4). This community having relied on the forest as a key source of livelihood had lost access to a significant section of forest without receiving the promised plantation work. Peters (2009, 33) also found that households nearby to the Energem plantation in the Bilene district could no longer access commonly used sites for firewood collection. Many households rely on the forest as a strategy for livelihoods, as Mozambique is highly forested, access to this resource will be threatened if large scale biofuel projects continue to increase. Areas with access to large water supplies are threatened also.

1.3 Water Resources

Large water resources are highly sought after by investors particularly when drip irrigation is required, some populations have had their access to water resources impacted upon. For example the ProCana project received a DUAT for 30,000 ha for a sugarcane plantation, the water required per year was estimated (by the company) at 108 billion gallons of water to be sourced from the nearby Massingir Dam (Borras et al 2011). This water resource prior to the project was already utilised for the production of electricity for export to South Africa, and as a livelihood resource for local communities. The Procana project proposal threatened to strain the local water resource Van der Zaag et al (2010, 837) found that the Massingir dam would face constraints on its capacity to supply the proposed 77,000 hectares of proposed projects in the district, as a result the water usage downstream would face shortages, thereby affecting the livelihoods of local communities. It is concerning also when projects commence in areas where local access to water is poor such as in the Sussundenga district where many households are required to walk over 2km to retrieve water. UK Company Principle Energy commenced a biofuel project nearby the Muvuaze river, during

consultation community members expressed concerns about losing access to the river (Nhantumbo and Salomao, 37). On the other hand ESV Bio Africa constructed water access points for Inhambane province which improved access to this livelihood resource. Improved access to wage labour can also occur with biofuel projects.

1.4 Wage Labour

Wage labour has the potential to provide additional incomes to the rural communities in Mozambique, however research is indicating that job numbers proposed by companies don't always eventuate. Schut et al (2010, 515) found that the average jobs proposed by the companies per hectare is between 0.14 and 0.17 jobs, out of the 17 biofuel project proposals a total of between 34,018 and 42,440 jobs were intended to be created. However the reality has been less than promising in Mozambique, for example the company Principle Energy holds a DUAT for 20,000 ha in the Dombe area and it had anticipated employing 1600 people, however employees reported that the company ceased paying its workers when it ran into difficulties (Borras et al 2010, 33). A similar case occurred in the Inhambane province where ESV Bio Africa acquired 11, 000 ha, the local farmers were willing to give up access to their land and common property resources, with the expectation that jobs, and improvements to the local school and hospital, however progress has been minimal (Deininger 2011, 244). ESV Bio Africa company had employed 1350 workers at higher than minimum wage. However workers abandoned their positions after the company ceased paying them due to financial problems (Ribeiro and Matavel, 34).

Wage labour from biofuel plantations may increase access to an additional source of livelihood, however this may also impact upon sustaining other livelihood strategies. Peter (2009) in his study of households impacted by Energem's biodiesel

plantation in Bilene Macia district of the Gaza Province examines the changes in income and livelihood generation due to changed labour patterns (Peters 2009). He found that with additional cash income from wages there was a decrease in household food production, microenterprise activities and cash crops sales (Peters 2009). He found that increases in cash income correlated with increases in expenditures, for those working on the plantations, and production capacity decreased for the household farms when family members left the family farm to work on the plantation. There were no services for increasing smallholder farming skills, the plantations offered some training related mostly to large scale cultivation (Peters, 33). Wages were below average when compared to local tourism and construction sector wages (Peters, 30). In the community of Chilengue it was often reported by households that plantation wages were not high enough to cover the costs involved in accepting the work. However in Nzeve plantation workers received enough to cover opportunity costs. Several households were found to spend less time on their fields, they often hired in workers. However, in May 2010 the company paid around 4.5 Million meticais, to workers of 2 months wages held in arrears and redundancy payments (see Appendix 1).

This section has provided some examples of how several households / communities impacted by biofuel companies, have faced loss of access (to varying degrees) to key livelihood resources such as agricultural land, livestock trails, forest resources, water resources and wage labour. Wage labour is often argued as an important pathway to poverty reduction that biofuel plantations can provide. Access to wage labour has increased in some cases - however several companies have failed to produce the amounts of jobs required, with examples of companies paying below and above the average wage, and others failing to pay workers. Additional impacts on the

maintenance of other key livelihood resources were also found. The range of impacts on food security will now be explored in further depth

Section 2: Food Security

This section will provide an insight into the implications of biofuel projects on poverty, by examining the impacts that biofuel projects have had on food security in Mozambique. Sustaining acceptable levels of food security is highly important to ward off poverty (ref?). Poverty from a basic needs perspective is the deprivation of requirements to meet basic needs such as food, water, and clothing (ref?). When food security is strained and accesses to livelihoods are reduced poverty reduction is less likely to occur. The changes in food production and consumption; and food crop conversion will be examined as a result of biofuel projects. Mozambique is vulnerable to food insecurity. One quarter of the population of Mozambique reaches a state of acute food insecurity at some point during the year. Chronic malnutrition is prevalent in 44 per cent of children under five in Mozambique (WFP 2012). This section will provide an overview of the current consumption and food production patterns will be presented followed with an outline of the current food security situation. It has been argued by critics that converting staple food crops into biofuels may have negative impacts on food security, such as reducing the supply and availability of staple foods. This impact will be examined in the context of Mozambique including an indepth case study on an outgrower scheme utilising 'surplus' Cassava.

2.1 Food production and Consumption

Most households conduct small scale farming for food production and cash income in rural Mozambique. The key staple foods consumed in Mozambique are cassava, maize, sorghum, millet and rice. Most of these foods are sourced and produced locally, apart from rice which is imported. Agriculture is most productive in the north and central regions of Mozambique. Pockets of high crop diversity exist in some regions, for example in the Bilene district the main crops are cassava, maize, groundnuts, beans and sweet potato completing the diets of the majority of households (Peters 2009, 5). Additional foods can accompany meals such as groundnut, coconut milk, beans, and seafood where available. The four major food crops for export in Mozambique include maize, sorghum, wheat and cassava (FAO 2012a). Cassava and sweet sorghum are being used in biofuel production in Mozambique.

2.2 Cassava and Sorghum

Sorghum is an important food crop for Mozambique. It is also a crop used for producing biofuels. The total production of sorghum in Mozambique for both food and biofuels has increased from 367 tonnes in 2006 until 410 tonnes in 2011 (FAO 2012a). The total area under biofuel production from sweet sorghum in 2010 was at 804 hectares and is projected to be at 3215 hectares in 2025 (Johnson and Matsika 2006, 52). Ecoenergia has acquired land throughout the provinces of Cabo, Delgado, Chipembe, and Catapua Province to plant sorghum and sugar cane for biofuel production for export to Sweden. Cassava is also one of the most important food crops for ensuring food security because of its ability to grow under harsh climatic conditions (FAO 2011, 35). Cassava is grown throughout Mozambique. Cassava supplies 30% of

the calories of the Mozambique population. Sorghum and cassava are both important crops to maintain food security (USAID 2009).

2.3 Cassava and the Clean Star Project

The Clean Star Project commenced in May 2012 in Sofala Province, which was established by the Novozymes Company. The project plans to utilise surplus cassava from local people in Sofala Province to produce ethanol sold on the urban domestic market as cooking fuel (at the equivalent price to charcoal) for cooking stoves (Biofuels Digest, May 19 2012). The stove is made and distributed by the company Novozymes it costs $30 to purchase – the equivalent of a week's wages in low income neighbourhoods of urban Maputo. The company aims to produce carbon credits which can be sold in the carbon market (Allafrica, May 26 2012). A women interviewed by Allafrica has started growing cassava specifically for the project (not surplus). She has decided to continue to produce charcoal to ensure her children remain in school.

The Novozymes president Steen Riisgaard encourages a shift from subsistence farming to modernisation and entrepreneurialism he states that "we want to demonstrate that you can use this technology, you can work with the bottom of the pyramid and you can make money," (The Guardian 29th May 2012). The first production was in May 2012, the company had to purchase the Cassava from South Africa, due to there being not enough available. Even though for the Sofala Province May is the 1st harvest of the season (USAID 2009, 2). This suggests that the company will not be relying predominately on 'surplus' Cassava. In this region many families gain income from burning logs to make charcoal. (The Guardian 29th May 2012). In Sofala, malnutrition is widespread and several pockets of the semi-arid province are often dependent on food aid (USAID 2009). In August 2010 FAO reported that 250,000 people required

food aid in four provinces including Sofala, Tete, Gala and Inhambane. The company is effectively changing the way small holders utilise their land for food production, in order to ensure the company will have cheap local cassava to purchase, and then sell back to the local people in the form of cooking fuel.

The impact of converting food crops into biofuel in Mozambique is yet to be fully understood, however projects such as the Cassava Star Project present issues that may arise from incorporating crops for biofuel production into house hold land plots normally producing food for consumption. Although associated benefits such as additional energy sources (ethanol fuel and cleaner stoves) should be noted.

Conclusion

This chapter has examined the extent to which biofuel projects have impacted upon poverty in relation food security in rural Mozambique. The current status of poverty is shaped by the historical periods that systematically suppressed rural African livelihoods. The current neo-liberal era has done little to improve and strengthen rural African agriculture, and the current status of poverty in Mozambique has remained virtually stagnant even with significant economic growth. Foreign investment in large scale biofuel projects for export is examined as representative of a current approach to reduce poverty in rural Mozambique. Many large scale projects have been found to reduce access to most livelihood strategies. On the other hand wage labour has been found to create alternative livelihood options, however with increase participation in wage labour it was found that in some cases impacts on household food production, household cooking, cleaning and nursing tasks occurred. Large scale projects that convert food crops to biofuels presents a concern to Mozambique however research is

yet to be clear about the impacts this has had on poverty. The challenge of maintaining food security is highlighted through a case study involving an out grower scheme for producing cassava (an important food security crop) for conversion to biofuels.

Chapter 6: Discussion

This discussion demonstrates that ABD is occurring in the context of biofuel projects in rural Mozambique with serious implications on poverty. The process of ABD has several key interlinked characteristics which are evident in rural Mozambique including the removal or displacement of peasants; commodification and privatisation of land; commodification of labour power; and suppression of alternative modes of production and consumption. These processes are found to have had significant impact on access to land and livelihoods; food security and on access to wage labour in rural Mozambique, which culminates in an overall negative impact on rural poverty.

Section 1 Biofuel Projects Mozambique and ABD

This section will introduce the nature of ABD in Mozambique in order to understand the impacts of ABD on rural poverty in Mozambique.

1.1 Removal or displacement of peasants

ABD requires the removal or reduction of access to peasants land and resources. In Mozambique many projects have encroached on the land of local populations and have resulted in the relocation of local subsistence and small scale farmers. It is common in Mozambique for the rural poor that have been impacted by biofuel projects, to relocate to land that is less fertile and smaller than previous land, at least 14 of the projects involved community consultation for relocation of some households. Physical displacement usually results in relocation in Mozambique for example land allocated to the Energem Company in 2008 was previously utilised for household, community farming and grazing land, consultation only occurred between community leaders and Energem, the households were

relocated to smaller plots. There was little evidence found of local populations receiving cash payments for land aside from the Aviam project which displaced farmers from their land. All projects must conduct some form of community consultation however this was often found to be inadequate, for example to the Quifel company displaced soya farmers that were not consulted. The removal or displacement of peasants can also involve reducing access to common property or open access resources such as forests, livestock trails and water. The private control of land and resources for biofuel projects often occurs through the dispossession of customary land and resources access.

1.2 Commodification and privatisation of land

ABD requires the release of low cost assets through privatization of resources such as land. Privatisation of land in terms of legally changing ownership has not occurred in Mozambique due to all land being owned by the state. However the control and access of land is basically the same for private investors. The avenue available to investors wishing to acquire long term control and access to land is relatively easy and is available at a low cost. Once a DUAT is acquired a 50 year long term renewable lease is granted which allows the company access and control over the land for up to 100 years. Therefore land becomes an available commodity accessed through private control over the land via allocation of a long term lease. The Mozambique government currently is beholden to the neoliberal approach which supports foreign capital investment, and as a result access and control over agricultural land by foreign investor is encouraged even when there is land reform that aims to recognise customary land rights. The Mozambique Land Law requires that all members be consulted before a project can be accepted, which is the part of the legislation most likely to allow communities to have power of control of their land however it was found that in Mozambique

in many cases consultation was inadequate. In addition, there are avenues to obtain land that don't require consultation, through a transfer of assets. Some biofuel project companies have acquired land without the approval of a DUAT through the transfer of land with assets on it. This process does not require community consultation. Therefore there is significant evidence that privatisation of land is occurring in Mozambique.

ABD requires the commodification of land; this is justified and mechanised through the process of investors acquiring land under the assumption (promoted by international aid agencies, investor countries, and host country governments) that Mozambique has a lot of 'idle' land. The government adopted the concept of 'marginal land' and mapped the country to formally classify land as 'available' for foreign private capitalist investment. The mapping was found to be inaccurate in determining land utilised by local populations, and several land disputes have occurred. For example the Elaion Africa Company was allocated 'idle' forest land that charcoal producers relied upon. Principle Energy was allocated prime agricultural land with plentiful water, fertile soils and an excellent climate. Sun Biofuels acquired land set aside for urban expansion. Aviam was allocated land that included a community cemetery and farmers land. Sekab was allocated control and use of communal land and the old chipembe dam a community resource (Further details see Apendix 1). Land mapped or identified as marginal has often included common property lands or resources, or areas set aside by peasant farmers for their livelihoods. Land in Mozambique has become a legitimate commodity through the systematic classification and legitimisation of land as 'marginal'. In additional to land, the process of commodification of labour power also occurs with ABD.

2.3 Commodification of Labour Power

Commodification of labour power is also a characteristic of ABD, and presents differently depending on the geographical and historical context. Marx argues that primitive accumulation involved peasants being forced to give up labour power in return for a wage. This occurred in Mozambique during the colonial period - colonialists used legislative powers and physical force to mobilize large numbers of workers for settler farms, foreign investors or for cash crops for the government. A further increase in foreign investment returned in the late 90s occurred and is continuing today, aided by the shift to neoliberal approaches to development by the government. ABD involves the transformation of rural populations into high surplus enclaves of labour devoid of connection to prior rural practices. However in Mozambique in regards to biofuel projects only partial transformation has occurred. Households currently depend on a range of livelihood resources. However, this research has demonstrated that with wage labour there is the likelihood of a reduction in subsistence practices as seen in the Energem case study.

Also, in Mozambique the jobs required to make the transformation into enclaves of high surplus labour is not occurring at the rate presumed. This thesis found that a significant amount of projects have ceased or stalled progress, and have failed to pay workers properly. There are consistently not enough jobs being created to spur the transformation of rural workers to become separated from their rural experience nor is there enough work to significantly improve incomes. This suggests that the process of inducing employment may be occurring in Mozambique. Capitalism requires access to cheap resources to maintain it; agricultural based capitalist projects also require cheap labour available in rural settings. Spaces where cheap labour is accessible must contain people who are in need of additional livelihoods, however are able to maintain some level of prior subsistence living so that they remain connected with their rural existence and do not move to urban areas. Therefore

providing large amounts of jobs could result in reduced use of smallholder plots of land for subsistence production, and therefore produce a cohort of skilled workers who become dependent on the market for consumer goods, and may seek work in closer proximity to urban areas where goods are more readily available. Therefore it is in the capitalists favour to not over-employ in these regions, to ensure that there is an ongoing surplus of labour. Creating this surplus of labour also requires removing part of the smallholders access to resource's so that they are always seeking additional livelihood alternatives. Large biofuel projects therefore reduce the access of small holders to key resources required to maintain rural sustainable living practices, this occurs through the suppression of alternative modes of production and consumption.

1.4 Suppression of Alternative Modes of Production and Consumption

ABD involves the appropriation of pre-capitalist knowledge and practices this is evident demonstrated in the example of company led out-grower schemes. Companies rely on local households for their farming practices to grow biofuel crops for cash, which often results in the reduction of household subsistence food production. The case study of the Cassava Clean Star Project reveals the Novozymes Company's intention of encouraging and creating a 'money making' out-grower scheme, where the company envisages that each household will produce surplus Cassava for purchase and conversion into ethanol. This further devalues pre capitalist practices and attempts to incorporate rural populations into the global cash economy. During the process of consultation this research suggests that several community members have been encouraged or coerced to give up their plots of land for less fertile or smaller plots in order to receive wage labour opportunities and improvements to infrastructure effectively reducing and devaluing their subsistence practices.

The ABD process of suppression of alternative modes of production and consumption has occurred to varying degrees throughout the history of Mozambique from the colonial to the current neoliberal period. Customary ownership of land was recognised during the colonial period - however the mechanisms to utilise land for subsistence living were systematically suppressed by colonial agricultural policy regulations, brutal tax collection, and forced migration for labour which in addition led to mass migration and widespread abandonment of land. Currently, this process is most evident in Mozambique where access to resources essential to maintain these alternative modes of production and consumption are threatened. To some extent access to livelihoods resources such as fertile land, forests, livestock trails and water has been reduced as a result of nearly all of the projects in Mozambique. This is a significant impact of the process of ABD with implications for rural poverty, and will be discussed further in the following section.

Section 2 Impacts of ABD: Rural Poverty Mozambique

This section will discuss the impacts of ABD in rural Mozambique due to large scale biofuel projects on access to land and livelihoods the implications this has on poverty. Reduced access to land and livelihoods have serious implications for food security. On the other hand it has been argued that employment generation reduces poverty through increasing access to additional livelihoods. Every aspect of the process of ABD involves the reduction or removal of access to livelihood resources. However by viewing 'employment generation' from a different stand point – as the process of commodification of labour, a different view of the impacts of wage labour is found. This thesis will argue that in the case of Mozambique the process of commodification of labour also contributes to poverty, particularly when promises to increase access to livelihoods have failed.

2.1 Land and Livelihood resources

Large-scale capitalist projects for biofuels are suppressing alternative modes of production and consumption as they have resulted in a reduction of access to livelihoods, and therefore reduced and created challenges for peasants to produce for themselves in rural Mozambique. Reduction of access to land and resources is a common occurrence in Mozambique. At least 14 projects were found to require displacement of local farmers from land and resources. Forested areas have been cleared for biofuel projects in Mozambique, which has reduced nearby household's access to key livelihood resources such as timber for charcoal production which for many households in Mozambique is an important source of income. For example The Elaion Africa biodiesel project required that local charcoal producers give up their access to forested land, with the promise of employment to replace this important income generating activity. Some biofuel projects in Mozambique have led to concerns around competition for water resources. Concern over access to vital water resources, and water shortages were the main issues found for three projects including the ProCana Project, Principle Energy's project and Sekab's project. Land and livelihood resources are essential for subsistence farmers to maintain constant and acceptable food security levels. The majority of households in Mozambique rely on subsistence farming, and a variety of additional livelihood resources for their survival, many are vulnerable to poverty. Biofuel projects in Mozambique have been found to limit many households access to key livelihood resources such as grazing lands for livestock herders, forest resources, and water thereby having a negative impact on poverty.

2.2 Food Security

Biofuel projects in rural Mozambique through the processes of ABD have been found to impact negatively on food security. For example displacement of peasants and

suppression of alternative modes of production and consumption can cause changes in food production patterns in some households. For example there have been several projects (eg.Clean Star, ProCana) where companies promote and subsidise small scale farmers to grow biofuel crops to sell to the companies (in some cases this occurs in addition to their setting up a large scale plantation on their lands). For example the ProCana project encouraged farmers to grow 80% crops for biofuel production and 20% food crops for consumption, with the promise that the sale of the crops will significantly increase their incomes. Farmers were displaced, relocated, and then encouraged to give up their current subsistence livelihood practices, and become dependent on the companies by cultivating biofuel crops for cash. Then the project was cancelled, the farmers were not compensated for the biofuel crops that they planted. As noted previously several projects have ceased operations, land sits idle, and compensation promises are unfulfilled, which suggests that in these situations poverty has not been reduced, it has actually been exacerbated.

This was similarly the case with the Clean Star Cassava project, which claims to utilise households 'surplus' Cassava. Cassava is an important crop for maintaining food security in Mozambique, the region where the project is commencing is vulnerable to food insecurity. It is suggested that Cassava utilised by this new company will unlikely to be surplus cassava. Evidence found suggests that some households have planted Cassava specifically to supply the company running the project. The company was also found to be taking measures to ensure that households grow Cassava for cash rather than sell companies 'surplus' Cassava. This is concerning as the district is relatively food insecure - it may place pressure on house hold food production. This is evidence of the ABD process incorporating subsistence farmers further into the global cash economy. It also allows companies to transfer the risk of cultivation on to households and therefore increase profits. The household members will essentially become their labourers. If household food insecurity levels in this

region increase poverty most certainly will be worsened. These are clear examples of how food security in Mozambique can be impacted negatively by biofuel projects, with implications on poverty. Adequate compensation is required to counteract these negative impacts on poverty.

2.3 Compensation and Wage Labour

Compensation for biofuel projects in Mozambique was found overall to be inadequate, and thereby not adequately contributing to the goal of poverty alleviation. Compensation deals are often settled during consultation. In Mozambique the research indicates that community members that agree to biofuel projects have been persuaded to do so, for social and economic benefits promised in return. Consultation was found to often be inadequate for several reasons. Consultation often involved one or two short meetings, all impacted parties were not involved, mostly local elites attended and the information discussed for the majority of projects researched, included information on approving sites for relocation rather than informing the community on the project details and seeking approval. Many projects have not fulfilled compensation promises made during consultation particularly in regards to employment. 6 of the 20 large scale projects have been found to have had financial problems, and have failed to fulfil compensation promises (See appendix 1). Principle Energy anticipated employing 1600 workers however the company faced financial difficulties and failed that target. The Mozambique authorities are considering revoking Aviam's DUAT of 26,000ha for biodiesel due to poor project progression and the company has only 50 workers, after employing 158 workers initially. In other cases companies have employed workers, however after some time have ceased paying them, or have let them go. ESV Bio Africa employed 1350 workers, however many of their workers left due to not receiving their wages. The Emvest Company with a plantation in the Chokwe district has also been accused of failing to pay wages to its workers. In 2010, the Energem

Company had to pay 4.5 million meticais in wage payments and redundancies that were withheld from employees. Relying on biofuel projects to reduce poverty via employment is simply not a sustainable or adequate approach to poverty alleviation in rural Mozambique.

This evidence demonstrates that the goal of profit making always outweighs the goal of poverty reduction. Companies lease land for little to nothing, and are effectively not required to compensate affected land holders or users unless their projects are successful in accumulating wealth. This further demonstrates ABD is impacting negatively on poverty. If cheap land and labour does not result in accumulation of profits the community is not compensated, this is problematic particularly as it is emerging as a relatively common impact of biofuel projects in Mozambique. Capitalism rely on access to cheap resources such as cheap land and labour to make a profit therefore both the land and the labour accessed is devalued, and those living on the land are unlikely to be pulled out of poverty when the value of the land is stripped and very little is received in return in terms of income or improved infrastructure.

Even when increases in income occur it has been found in the case study of Energem that not enough jobs were provided to increases incomes enough to sufficiently impact on poverty. Research from the Energem plantation in the Bilene District suggests that a significant amount of households that took up employment with the plantation had changes to their income and livelihood generation. The research conducted in this thesis indicates that in several projects in Mozambique subsistence farming activities are reduced as a result of the introduction of employment to communities from plantation biofuel projects. Even where employment has remained relatively stable and the company has remained for several years, case studies indicate that several households have faced additional impacts to their household production such as decreased food production and decreased time for household chores and leisure, and increases in household expenditures. Overall, although some benefits to

household cash incomes can occur from biofuel plantation employment, there has been little evidence of employment from biofuel planations having a significantly impact on poverty.

2.4 Poverty

All of these intertwined impacts help understand the nature of ABD and its implications on rural poverty in Mozambique, and combined they have significant implications on poverty. The conceptual framework ABD reveals how capitalist companies through processes of displacement of peasants; commodification and privatisation of land; commodification of labour power and suppression of subsistence agricultural modes of production and consumption limit access to land and livelihoods. Customary and subsistence practices are devalued thereby reducing the rural poor's ability to maintain subsistence production and incorporate households into wage labour and out-grower commitments that are simply not adequate enough approaches to reducing poverty. Wage labour from biofuel projects has been found to be unreliable as a third of projects have faced financial issues which have led to consequences such as projects failing to pay wages, or laying off workers, or ceasing / placing projects on hold (details see Appendix 1). Furthermore in these instances compensation promises such as improving infrastructure has been placed on hold, or ceased. Although biofuel projects are relatively new, and some projects are running to schedule, significant negative impacts on access to livelihoods and failed promises for compensation suggests that ABD as the path toward poverty reduction is problematic at best, and at worst can contribute to exacerbating poverty.

Chapter 7 Conclusion

This study has examined whether developing nations such as Mozambique can achieve poverty reduction through large scale biofuel projects. The literature review highlighted two key perspectives, one that was critical of biofuels and one that promoted biofuels as a solution to rural poverty. An agrarian political economy perspective was utilized in this thesis as it provided nuanced and adequate tools for analysing the topic, in particular the concept and process of Accumulation by Dispossession (ABD). This theoretical framework had not been applied to large scale biofuel projects in Mozambique in relation to the impact of ABD on poverty. This theory provided a framework to analyse the impact of large scale land investments on poverty. Data was gathered through primary and secondary resources, case study and contextual analysis research methods were utilised to present two key data chapters on Land and Poverty. The data was then analysed using the processes of ABD to access the impacts of biofuel projects in Mozambique as discussed in chapter six. Several conclusions were found.

ABD is has had a significant impact on rural Mozambique. The impacts of biofuel projects combined have had an overall negative impact on access to livelihoods, and devalues subsistence practices, and therefore large biofuel projects will unlikely achieve a reduction on poverty in rural Mozambique. Psuedo-privatisation of land is occurring in Mozambique where investors have a relatively easy and cheap avenue for accessing and controlling land for long terms, this devalues the land, and the current uses for it as well as legitimises displacement, which in turn reduces access to livelihoods and impacts on poverty. The classification of ‘marginal’ land in

Mozambique led to land disputes and the legitimate access and control over common property land. This classification process also legitimises the commodification of land and therefore devalues subsistence practices which utilise common property resources to maintain livelihoods. This also reduces access to livelihoods and impacts on negatively on poverty. Food security is threatened when access to fertile lands for food production, cattle grazing trails, water and forest resources that provide food products are reduced. Reduction of access to land and other key livelihood resources is common in Mozambique, and creates challenges for peasant populations to self-provide, which in turn reduces households' ability to ward off poverty.

ABD in Mozambique has caused many households to rely on more on wage labour and less on subsistence practices. Labour has been found to be unreliable in Mozambique with a significant number of projects facing financial problems. There is evidence that suggests that in Mozambique companies are inducing labour by hiring, firing and rehiring workers. This creates greater dependency on markets and an environment where lower wages are accepted. The process of commodification of labour in rural Mozambique has failed to reduce poverty. Households remain to some level connected with subsistence livelihoods; this likely to be in the capitalists favour, so that rural populations remain in the rural areas. Low wages and reduced access to livelihoods will not reduce poverty.

It was found that suppression of alternative modes of production in Mozambique is devaluing and reducing access and utilisation of subsistence livelihoods which has negative impacts on poverty. Appropriation of pre-capitalist knowledge is occurring in Mozambique when companies dictate to households about what crops they should plant in order for the company to then purchase them. Households then take on the risks that are unmanageable as they are tied to wider national and global markets.

Projects that promote the growth of staple foods to be sold to companies for the conversion into biofuels are potentially problematic particularly in food insecure regions. Consultation is often inadequate in Mozambique this reduces community member's ability to bargain for adequate compensation. The compensation promises of jobs and improved infrastructure in many cases have not been followed through. Employment generation has simply not been inadequate in compensating for the loss of long term control and use over the land and reduced access to livelihoods. Biofuel projects are not contributing to poverty alleviation. Profit making goals by investors appears to outweigh the goal of poverty reduction.

Overall, it was found that the majority of biofuel projects through the process of ABD reduce access to livelihood resources and devalue and suppress subsistence livelihood practices, which is creating a partial transformation to enclaves of property-less labourers. Aside from the numerous negative consequences of this process on poverty such as increased vulnerability to food insecurity, this process is extremely concerning as the labour available for plantation work for biofuel projects in Mozambique has been highly unreliable. At least one third of projects have faced financial problems to the detriment of communities. Many have failed promises to improve infrastructure. Several have failed to employ the number of worker promised, and a significant number of projects also have either failed to pay workers their wages, and/or have let go of a large number of workers. Introducing large scale biofuel projects in Mozambique as a win-win solution to rural poverty, is problematic at best, and at worst it is suggested that overall these projects may exacerbate poverty. The implications of this research suggest that governments in developing nations should consider the implications for rural populations before implementing strategies to promote biofuel investors into their countryside. Further research could follow on the

impacts on additional cultural and political factors impacting on poverty that were beyond the scope of this study. The implications of this research suggest that governments in developing nations should consider the implications for rural populations before implementing strategies to promote biofuel investors into their countryside. Further research could follow on the impacts on additional cultural and political factors impacting on poverty that were beyond the scope of this study.

Appendix 1 Table of Biofuel Projects Mozambique

Company	**Area** (ha)	**Province**	**Purpose**	**Project start year**	**Ownership**	**Type of Project (outgrower or monocrop)**	**Consultation**	**Notes / Impacts**
Over 10,000 ha								
SGC Energia	18,920ha	Mazamba, Cheringoma District Sofala Province	Jatropha - Biodiesel	2009	Portuguese and Mozambican interests	monocrop, 90% for export, 10% domestic usage	consultation occurred, promised employment to 5,000 seasonal workers	projected 1.2million litres a year, $53 million investment
Mozambique Principle Energy	23,000ha	Dombe District, Central Manica Province	Sugarcane - Bioethanol	2008	Owned by Principle Capital, registered in UK, Mauritius, Luxembourg, and Switzerland.	large scale plantation and production facility, company claim one third will be for outgrower scheme (technical support for inputs, no direct cash credit for smallholders, will act as financial intermediary)	poorly conducted consultation, however without conflict, agreed to set up irrigation pumps, schools, health centres, water supply electricity. Promised employment projected at 1600 jobs at full operation, which equals 1 job per 18 hectares of fertile land, sept 2011 factory on standstill	the company was allocated prime agricultural land as described by the company 'plentiful water for irrigation, fertile soils, and an excellent climate for superior sugarcane yields' project reconsidered sept 2011, bioethanal factory on standstill. Company has partnered with University of Cornell to develop sustainable practices and produce high yielding crop varieties
Deulco Investiment Mocambique	15,000ha	Inhambane Province	Jatropha - Biodiesel	2005	Deulco Emvest is a Mozambican registered company owned by Emvest	monocrop, large scale plantation	company states that it upgraded existing infrastructure, provided an onsite nursery and training	established partnership with Canadian based company for an additional 6,000ha in Gaza, another commercial project is underway with Mauritian Agricultural Development company

Galp Energia / Mozamgalp	10,000ha	Manica Province	Jatropha - Biodiesel	2009	Portuguese	monocrop for export to Portugal and Spain	acquired land by purchasing the infrastructure of previous company, rather than going through legal process of requesting a DUAT for new land, consultation did not occur	plan to invest additional Euro 1.2million per year until 2016 for the exploration of further biofuel production in Mozambique.
Ecomoz	50,000ha	Inhambane and Maputo Province	Coconut - Biodiesel	2007	joint initiative between Petromoc (30% share), Hende Wayela and other key stakeholders	monocrop plantations, small scale holders also supply cropra to oil processing unit in Inhambane biodiesel plant	aim to develop projects for oil baring crop production, increase participation of rural populations in vegetable oil and importing vegetable oil	company facing shortages of raw material, Coconut oil traditionally processed for milk (important ingredient in coastal cuisine), soap and cooking oil, to maintain supply requires expansion or deviation of traditional use to biofuels, likely to compete with local usage, Ecomoz is planning to expand production to the Manhica disdrict, Maputo Province, requiring an additional 21,000ha
Energem Resources	60,000ha	Nzeve and Chilengue Communities Bilene District, Gaza Province, Mozambique	Jatropha - Biodiesel	2008	South African and British owners	2 large scale monocrop plantations for export	land allocated was previously community farming and grazing land, consultation occurred between community leaders (Regulo) and Energem, promises made to develop area in exchange for the land,	In May 2010 the company paid around 4.5 Million meticais, to workers of 2 months wages held in arrears and redundancy payments, all workers (297 workers) lost their jobs except for 9, the workers had not been paid wages from March and April 2010 due to companies alleged problems financially, company now seeking other partnerships

Sekab / Ecoenergia	120,000ha	Cabo Delgado Province	Sweet sorghum and sugarcane - Bioethanol, intentions to integrate cassava intercropping	2008	Sweden	predominately monocrop plantation, non-contiguous for the 120,000 operating over several district plantations, with planned outgrower scheme, 85% export to Scandinavian countries, planning small amount to domestic market through PETROMAC	company says that socio-economic, environment and soil studies undertaken a variety of sites chosen for their soil type, climate and rainfall	occupation of communal land, conflict over the control and use of the old chipembe dam
Sun Biofuels	40,000ha	Chimoio and Matsinho-Gondola community, Manica Province	Jatropha - Biodiesel	2007 - acquired land through transfer	British Company	monocrop plantations for export (India & Europe) and MOU to provide domestic supply's, plans to build processing factory in Gondola district, Manica	land acquired through transfer, failures to adequately consult community and fulfil promises made during community consultation; in Manica the Jatropha plantations have 630ha have been allocated within the municipal boundaries leading to conflict between the council of Chimoio and the company, mayor is concerned for available land for urban expansion, project also promised to support a school, a police station and train workers, in aspects of the operation of the farm	former tobacco farming land transferred to Sun Biofuels through the purchase of infrastructure. The company is building a processing factory, expects at full operation to produce over 20,000 litres per year

ESV Bio-Africa	45,000ha	Inhambane Province	Jatropha - Biodiesel	2007	Ukrainian	monocrop plantation, manually irrigated in nursery before planted, consumes 10,000 litres per day from Inhassaune river	DUAT acquired, negotiation with community leader, promised to improve school and hospital, however had to cease work due to financial troubles, community has new water supply points, and assisted in funeral costs, employed 1350 workers, paying above minimum wage, however many workers left after long periods of non-payment of salaries	ESV Bio Africa in financial crisis 2009 and pulled out from the project many farmers lost their jobs and received no compensation for jobs promised under the agreement
Viridesco Ltd	10,000ha	Lichinga, Niassa Province	Jatropha - Biodiesel	2007	UK	monocrop and outrower scheme, processing plant	many community members have been given seeds to grow Jatropha which they can sell back to the company, it is not known whether they have been trained in Jatropha farming, or are supported in anyway	good agricultural condition for Jatropha - good rainfall, experiencing promising yields
Grown Energy Zambeze Ltd.	59,000ha	Chemba district, Sofala Province	Sugar cane - Bioethanol	2009	subsidiary of Tata Chemicals, Mozambican, Asian and South African investors	monocrop additionally soya and beans, and cattle production, 10 % for domestic market 90% export to Europe, USA, Japan	agreed to set up social fund worth $US 2.7million for supporting local education, health, infrastructure, and energy	aim to produce 100 million litres of ethanol a year for export, in 2011 an additional 320 million invested and a total of 59,000 ha acquired

Aviam & Quintiva	10,000ha	Micolene, Nacala-a-Velha District, Nampula Province	Jatropha - Biodiesel	2008	Italian & Mozambican interests, intended for export 80% to UK, 20% domestic	monocrop preparing nurseries and cultivating, intend on outgrower scheme	promised significant number of jobs, an outgrower scheme, and to meet the following requirements: to promote and encourage social growth, including building a health centre, a school, a canteen for workers, a water fountain, and skill up the local population, according to Jornal Noticias community consultation occurred with all of the affected members, farmers were removed from lands and given payment in compensation, cultivation will occur over cemeteries however, disagreement over whether this land should be cultivated	initially intended to expand to 26,000ha, Aviam Company state that Mozambique is a good location for its climatic conditions, efficient logistics network and government policy favouring biofuels, the website boasts that it is one of the few projects that have obtained a DUAT for large scale Jatropha plantation in Mozambique. On 24 July 2012 Allafrica reported that Mozambican authorities are considering taking away Aviam's land title, as it is not following through with the projects agreements and schedule. The company has used the 10,000 hectares to plant only 150 hectares, originally the company hired 158 workers, it is down to 50 workers well below what was promised, no progress on social growth developmental promises
Luambala Jatropha Ltd	31,000ha	Maniamba, Niassa Province	Jatropha - Biodiesel	in process of gaining DUAT for all plantations	Italian and Mozambican	monocrop plantations, export raw material to India	consultation occurred with affected communities, only the Maniamba plantation holds a DUAT, company says that the other plantations are running due to former Governor Arnaldo Bimbe's permission	350 workers on a season and permanent basis, company states that the land is degraded and non-productive land, consultation with affected communities occurred, only the Maniamba plantation holds a regulated DUAT, remaining plantations are running due to former Governor Arnaldo Bimbe who gave permission

Central African Mining and Exploration Company (CAMEC) Project Procana	30,000ha	Massinger District, Gaza Province	Sugar cane - Bioethanol	approved 2007 revoked 2009	UK; owner's name changed twice, from Central African Mining and Exploration Company (CAMEC) to Bioenergy Africa to Sable Mining	60% of land for production of feedstoock, 40% for processing, irrigation, predominantly monocrop, 5-10,000ha planned outgrower scheme.	there was community consultation with local elites and elders, relocation was organised, promises of drainage schemes for warehouses, schools health facilities, expected to create 7,000 new jobs, technical assistance to outgrowers, secure and fence land for grazing, build three water sources, two tanks for livestock water, clinic and houses	land acquired by CAMEC was also allocated to displaced community living in the Limpopo National Park, 30,000 ha granted 2007 and revoked by government in 2009 after the company abandoned project
Vale, Embrapa JV	10,000ha	Para??	Palm Oil - Biodiesel	2011	Brazilian	monocrop plantation, starting with 10,000 hectares with the intention of working up to 30,000 hectares by 2019		The company under a partnership with the EU funded a sustainability feasibility study for the Mozambique government in relation to biofuel production in 2011. The company intends with the partnership to build research centres to develop processes such as 'carbon sequestration an alternative fertilizers' develop microorganisms to make land that is marginal more fertile, searching for more efficient solutions
Quifel Energy Moçambique, Lda	10,000ha	Lioma, northern Zambezia Province	Soy and Sunflower for Biodiesel	2009	Portugal	predominately monocrop plantation however 2,500 was promised for an out grower scheme	consultation involved two meetings on the one day, not all farmers affect were consulted, promised job opportunities, outgrower scheme, District Administrator of Gurue write letter due to poor project progress, poor compensation and land relocation	Initially applied for 23,000 ha, however was only granted 10,000 by council of ministers, conflict between land utilised by small holder commercial farmers for a project CLUSA, were removed from land, have already cleared and planted some of the land acquired, no progress CLUSA continued. Project significantly low progress, questions around its likelihood of continuation.

below 10,000ha								
Di Oils	5348ha	Maputo Province	Biodiesel - Jatropha		South African and Swaziland	monocrop plantation for export		was the first UK Jatropha company in Africa, joint venture with BP failed in 2009, froze its export plans 2009 project progress at this stage is unknown
Elaion Africa	2000ha	Sofala Province, Dondo District	Biodiesel - Jatropha	2007	German	In 2010 there were different scales of operations, a small scale 65 ha (combined intercropping with forestry), monocrop 2,000 ha (for export to Germany), a farmer operation (local supply)	consultation occurred community only received information about project on the day of meeting, planned to collaborate with small-scale holders and build their capacity to harvest Jatropha, community gave up forested land utilised by charcoal producers promised employment, small holder scheme and other social benefits,	part forestry project due to poor soils for Jatropha
Emvest	2,000ha	Chokwe District	Biodiesel - Jatropha	2009	UK, Emvest a joint venture between south african company RusselStone,	monocrop plantation for export	1,500ha disputed land in Chokwe, plans to cultivate and irrigate monocrop plantation anyway	Community - failure to pay some wages, first harvest due 2012
Galpbuzi	8,000ha	Bandua, Buzi, Sofala Province	Biodiesel - Jatropha & Sunflower	2009 - planning	partnership between Mozambique company Companhia do Buzi and Portugals Galp Energia	50% most export, 40% domestic market	expected to export 2013/2014	long term plan to set up biofuel refinery in Buzi, Sofala Price, requiring additional 8,000 hectares for Jatropha and sunfllower

ADPP/FACT	small holder scheme	Cabo Delgado, Nampula, Zambezia and Sofala Provinces	Biodiesel-Jatropha		smallholder project, for local use and exchange	dutch NGO called FACT-Foundation	aim to capacity build local farmers, ensure participation, implemented through farmers clubs, in conjunction with teacher training colleges, supplied material to build wells for drinking water and irrigation	small nurseries, target group small vulnerable subsistent farmers, initiate the local production of Jatropha seeds for local market
Clean Star Mozambique	outgrower scheme	Dondo, Sofala Province	Cassava - Bioethanol	2012	partnership between Clean Star Ventures and Novozymes	Mozambican farmers paid to produce surplus cassava that is converted to ethanol at a new facility in Beira. The fuel is then shipped to the capital of Maputo, where CleanStar sells to the local stores, along with the stoves required to cook with at the cost of $30 (urban low income weekly wage).	1,500 local farmers producing cassava for fuel, company promises triple in income for local producers, company argues that cassava accounts for one third of yield, farmers must plant edible crops as well, and that the Cassava sold is surplus Cassava	biofuel plant opened in Dondo, ethanol is to be distributed to stores in Maputo for cooking stoves (also produced and sold by CleanStar)
Total land	589,268 ha							

Notes to the table

There is no complete land registry provided by the Mozambique government. This table's information is partial and gained from a variety of first and secondary sources it may contain errors and omissions.

Approval notes

DUAT = right to access, use and develop land; multiple DUATs - land has been allocated in smaller sections

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