ENGENDERING THE METABOLIC RIFT: A FEMINIST POLITICAL ECOLOGY OF AGROFUELS

by

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A THESIS

Presented to the Environmental Studies Program
and the Graduate School of the University of Oregon
in partial fulfillment of the requirements
for the degree of
Master of Science

June 2012

THESIS APPROVAL PAGE

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Title: Engendering the Metabolic Rift: A Feminist Political Ecology of Agrofuels

This thesis has been accepted and approved in partial fulfillment of the requirements for the Master of Science degree in the Environmental Studies Program by:

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Degree awarded June 2012

THESIS ABSTRACT

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Master of Science

Environmental Studies Program

June 2012

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This thesis analyzes the gendered impacts of plant-based alternatives to petroleum, commonly called biofuels. Synthesizing case studies, scientific research and policies papers, this theoretical work adopts the term “agrofuels” coined by the peasant organization *La Vía Campesina* to reflect the true nature of these commodities – one of dispossession and ecological destruction. This paper documents the falsity of the claim that the fuels are “sustainable” by presenting facts linking them to deforestation, loss and pollution of water sources, destruction of important biodiversity and the knowledge that maintains this diversity, as well as economic exploitation. Most importantly, I verify that the adoption of agrofuel expansion exacerbates gendered patterns of exclusion and, in most cases, worsens women’s positions within the communities targeted for feedstock production with regard to land tenure, household energy maintenance, independent income and physical integrity.

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Dockstader, S. (2005). Coping with field bindweed without using herbicides. *Journal of Pesticide Reform, 25*(1), 6-7.

ACKNOWLEDGMENTS

I would like to thank my thesis committee members, Drs. John Bellamy Foster, Derrick Hindery and Ted Toadvine, for their patience and guidance. I am especially indebted to my friends in the Sam Bond's "Friday Night Group" without whose goading and encouragement, I would never have dreamed of applying to graduate school. Special thanks go to Gayla Wardwell who smoothed my path throughout my graduate career. I am grateful to Lise Nelson and Jocelyn Hollander for sharing their knowledge of gender theory. Lastly, I would like to thank the women in my life for supporting me, challenging me, and encouraging me to think more deeply: Steen, Judi, Paula, and the U.O. Social Sciences Feminist Research Interest Group.

This work is dedicated to my girlfriend and lover, Steen V. Mitchell, to my mother, Judi Giberson-Smith, and to my grandmother, Gertrude Dockstader.

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CHAPTER I

INTRODUCTION

It makes sense for us to collaborate for the sake of mankind. We see the bright and real potential for our citizens being able to use alternative sources of energy that will promote the common good. – George W. Bush[1]

On March 7th 2007, the day before the world celebrated International Women's Day, 900 poor peasant women occupied Brazil's largest sugarcane plant, the Cargill-owned company, CEVASA. As part of a national week of struggle dubbed *Women in Defense of Food Sovereignty*, the women were protesting a new energy pact between the US and Brazil to increase the production and funding of biofuels. In a communiqué, the occupiers denounced the fuels as sources of biodiversity destruction, poverty, pollution and labor exploitation (Food First 2007). In the financial district of São Paulo, ten thousand Brazilians to took to the streets to protest US President George W. Bush's arrival. The agreement between the world's two largest producers of ethanol[2] made the fuel an internationally traded commodity and proposed increased biofuel research and development. As police beat and tear-gassed largely peaceful students, trade unionists, farmers and landless peasants, Bush toured an ethanol plant with Brazil's President Luiz Inacio Lula da Silva who declared, "We come to celebrate a strategic partnership between the United States and Brazil (BBC News 2007)." The accord helped to set in motion a wave of legislation across the globe harnessing agriculture to fuel more tightly than ever before.

[1] Associated Press 2007.

[2] Brazil and the United States produce 70 percent of the world's ethanol from sugarcane and corn respectively (BBC News 2007).

Faced with the triple crises of dwindling oil reserves, financial woes, and global climate change, Organisation for Economic Co-operation and Development (OECD) governments have begun to turn to plant-based "biofuels" to meet their growing energy demands. Indeed, in 2008 Jad Mouawad writing for *The New York Times* noted that worldwide population is predicted to grow to nine billion people by the middle of the century with a corresponding rise in the number of petroleum burning vehicles to more than two billion. Moreover, a study by the U.S. Energy Information Administration (USEIA 2010) forecasted that global consumption of petroleum and other liquid fuels would grow from 86.1 million barrels per day in 2007 to 110.6 million barrels per day by 2035, eighty percent of which would be guzzled by the transportation sector. The rise in petroleum consumption coincides with warnings that available supplies of oil may be running out (Simpson 2006).

Mouawad's (2008) article noted that though the developing economies of China and India were steadily increasing their oil demand, the United States was the only industrialized nation to see its oil consumption explode since the petroleum shocks of the 1970's and '80s. The article stated that the country was living "beyond its means" with the least efficient fleet, the lowest gas prices, and the longest commutes, noted that its fuel efficiency attempts were "underwhelming" and quoted former US energy secretary James Schlesinger's observation that the country was capable of only two approaches to energy policy: complacency or crisis. The OECD nations have chosen the latter. As with all crises capital's response is innovation and the construction of a corresponding narrative to ease the transition to a new stage in its development. Funded by agribusiness, supported by scientists flush with industry cash and looking to revitalize

their agricultural sectors, politicians in the North and growing economies of the South began setting “biofuel” mandates and introducing “flex-fuel” vehicles into their fleets (Mathews 2007; Rothkopf 2009).

US Speaker of the House Nancy Pelosi called the new legislation “a shot heard ‘round the world for energy independence” (Holt-Gimenez & Kenfield 2009, p. 26). Under the government of George W. Bush, Democrats and Republicans eagerly signed into law the United States Energy Independence and Security Act of 2007 which calls for an aggregate of 36 billion gallons (~136.27 liters) of biofuels to be used in transport by 2022. In 2009 the European Union (EU) set a binding target of 10% biofuel (primarily diesel) use in transportation by 2010 to meet Europe’s growing demand. Moreover, the EU Directive 2009/28/EC called on biofuels to reduce greenhouse gases (GHG) by increasing their use from 35% to 50% by 2017. In 2006, as part of its eleventh *Five Year Plan*, China’s National Development and Reform Commission (NDRC) set a goal of 6.6 billion liters of ethanol by 2010, but the government suspended the target in response to the precipitous rise in food prices in 2007/2008. Nevertheless, in 2007, the NDRC mandated a 10% increase in renewable energy by 2010 rising to 15% by 2020 (Sorda, Banse & Kemfert 2010). The result of these national mandates has been a rush to secure land and water. Lacking the available land on which to grow the feedstocks for this new class of fuel, governments in the United States and Europe are looking to the rural areas of the Global South to meet their demands. Prompted by International Energy Agency chief Claude Mandil who declared, “If the United States and Europe are serious about biofuels, they must turn to the South for their supplies (Mathews 2007, p. 3550),” biofuel

advocates are seeing win-win opportunities for consumers in the North, small farmers in the South, and the planet as a whole.

This thesis rejects their claims and illuminates the grim consequences of large-scale plant-based liquid fuels for the environment and local communities in order to show the real-world effects of their implementation on gender relations and on women's particular position in those communities. This paper argues that corporate interests have hijacked the critical issues of environmental destruction, global climate change, and petroleum dependence to advance an agenda of capital accumulation in the form of these alternative fuels. Far from preserving biodiversity and improving rural livelihoods, as proponents claim, large-scale cultivation of so-called "biofuels" on the lands in the Global South threatens food sovereignty, results in a worrying loss of biodiversity, erodes traditional ecological knowledge, and disrupts and reorganizes local gender relations (McMichael 2010; Danielsen et al 2008; Julia & White 2011; Tsikata & Yaro 2011).

The development of biofuels in the Southern Hemisphere has ravaged both wild and marginal forests, fields, and grasslands, destroying biodiversity and threatening ecological knowledge for many already-impoverished people, particularly women. Because, in many rural communities in the Global South women are usually responsible for food supplementation, household water and wood provision, and medicine preparation, loss of biodiversity threatens their traditional ecological knowledge as well as posing a grave danger to health and food security. In many rural contexts women maintain and protect important genetic diversity through their underappreciated custodial roles in weeding, pruning, overseeing animals, seed selection, sowing, and harvesting. Moreover, gendered practices and spaces confine women to smaller and less arable plots

of land where they grow “minor” crops. In sub-Saharan Africa, studies of biofuel development are showing that women’s low status in some communities has led to the loss of their crops in favor of feedstock production, resulting in significant loss of income and household stability (German et al. 2010; Tsikata & Yaro 2011).

This thesis also exposes the cruel falsity of the contention that these alternative fuels are “sustainable” because they can be grown on “marginal” and degraded lands. Several cruel ironies have resulted from biofuel development. Because they generally do not own land, cultural or informal arrangements enable women access to marginal lands where they collect wood, water, herbs, and animals for household use and sale (Julia & White 2011). Encroachment into these lands has spelled a loss of income and access to the lands, impoverishing them and their communities. Another perversity of biofuel development is that clearance of forest and marginal land forces women to walk farther for the fuel they gather for household use and sale, resulting in increased physical and economic stress (Tsikata & Yaro 2011).

This paper shows that women do most of the world’s agricultural labor but they are not seen as improvers or owners of land and thus the capitalist equation of exchange value creation with ownership rights dispossesses women and as such is patriarchal (Waring 1988). In fact, in communities where women have traditional rights to land, biofuel companies’ formal titling of “heads of households” has privileged men and completely stripped women of any voice in land proceedings. This case can be seen most clearly in Indonesia where the state’s masculinist approach to land ownership converged with local patriarchal decision-making to formalize male ownership and inheritance, excluding women’s traditional rights (Julia and White 2011).

I also show how the encroachment of alternative fuel monocultures on communal, state lands and even privately-held land is also displacing local men who must seek work as migrants on feedstock plantations and other casual, seasonal labor under miserable and dehumanizing conditions. Additionally, biofuel development is also pitting poor male laborers (both indigenous and foreign) against indigenous communities, resulting in violent conflicts that, in turn, result in sexualized violence and prostitution of local women. The increased displacement of male relatives and poverty exacerbated by the fuels' feedstock development has resulted in changed gender expectations associated with women's sexual-economic activities and is contributing to a rise in sexually transmitted infections, unwanted pregnancy, domestic violence, and poor women's increased economic vulnerability and material poverty (Sirait 2009; Rey 2009).

Capitalism's drive to eliminate labor costs is resulting in increasing mechanization opening the door for women's participation in the labor force as an underrepresented class of workers. And while women's independent earning has been shown to improve their bargaining ability within the household, the low wages and high piece rate quotas set by biofuel companies often demand that migrant men enlist their wives and children in unpaid labor (Nanda 1997; Razavi 2009; Rossi & Lambrou 2008; Schroeder 1999). Moreover, biofuel companies are availing themselves of the stereotype that women as more docile, precise, and with the knowledge that unions often exclude the concerns of women (Schott 2009), enabling them to capture even more value through the employment of women as scavengers and pesticide applicators as can be seen in Papua New Guinea and Malaysia (Rossi & Lambrou 2008; Houtard 2010; Julia & White 2011). The expansion of women's unpaid or poorly paid contribution, in addition to their

domestic labor, comes at a price to households and communities in the form of food and financial insecurity as well as social consequences (Anderson 2006; Friends of the Earth, LifeMosaic & Sawit Watch 2008; Tsikata & Yaro 2011). In some cases women's participation in feedstock production has enabled them to retain their earnings and improve their domestic positions and that of their children in relation to their male spouses but has resulted in shaming at the hands of others in their communities (Anderson 2006). In other cases, the price of stereotyping, coupled with poverty, has seen women's exposure to toxic pesticides causing the risk of chemical insults to their health and reproductive capacities (Friends of the Earth, LifeMosaic & Sawit Watch 2008; Houtard 2010).

The foregoing evidence disproves the contention by biofuel proponents that the fuels improve marginal lands, benefit local communities with good jobs, halt biodiversity destruction and represent a "green" solution to climate change. Accordingly, this paper eschews the life-affirming prefix "bio-" in reference to them in favor of the term "agrofuels," coined by the international peasant rights organization, *La Vía Campesina*, to reflect their true nature, one of dispossession and misery for the people of the Global South, particularly women (Biofuelwatch et al. 2007, p. 4).

Methods and **Limitations**

My interest in this topic grew out of the food riots of 2007/2008 and the scuffle between the United Nations Food and Agriculture Organization (UNFAO) director, Jacques Diouf, and the agriculture ministers of the US, Brazil, and Europe at the 2008 United Nations Food Summit. During the furious debates over whether agrofuels were

contributing to the rising food prices, much was mentioned about the world's urban and rural poor and the plight of farmers in the Global South but very few, if any, of the accounts gave voice to the very people affected. International nongovernmental organizations (NGOs) and the UN agencies responded to the crisis by issuing a flurry of reports documenting land tenure, food, and environmental issues related to agrofuel cultivation. Meanwhile agrofuel development projects continued apace despite mounting evidence indicating that their spread was disrupting communities and devastating the environment.

Drawing on feminist political ecology, gender theory and critical political economy, this paper examines and rejects the contentions put forward by proponents who claim that large-scale production of these fuels is environmentally, economically, and socially sustainable. It particularly refutes the assertion that large-scale cultivation of plant-based liquid biofuels is beneficial to women in the Southern Hemisphere. In order to prove that thesis, I have tried to foreground as much as possible the voices and experiences of those whose lives and livelihoods are affected by agrofuel development. The information presented here is a synthesis of policy briefs, non-governmental organization (NGO) reports, and scholarly articles. In this thesis I have striven to avoid treating gender and race as simply add-ons grafted to a materialist approach. Just as much as capitalism is grounded in institutional power, so gender and race derive their interactions and constructions from systems of power that are interlocking and constantly changing (Hill Collins 1995; Nakano Glenn 1999). This paper is, therefore, illustrative rather than exhaustive. This work attempts a representation of what McCall (2005) refers to as a "partial crystallization of social relations" (p. 1781), ethnographic moments of

gender theorized at the intersection of race and class under agrofuel capitalism. To this end, I have tried to include the historical, cultural, and ecological backgrounds of the affected people to show how the changing landscape disrupts or exacerbates gendered interactions.

I worked with texts in political economy, gender/feminist theory, and development theory to form the framework of this examination. I obtained most of the theoretical and critical material primarily from books and peer-reviewed journals. In the interest of fairness, I sought information by and about agrofuel proponents such as international finance institutions (IFIs), energy policy experts, UN agencies, government departments, and agrofuel companies through both library and internet research. Finally, with reference to specific geographic areas and affected communities, I engaged scientific papers, political economy journal articles regarding the impacts of agrofuels, newspaper stories, and policy documents generated by NGOs.

Since the foundation of this examination is limited to case studies performed by NGOs and government and UN agencies as well as papers written by other scholars, one of the weaknesses of this paper is that those organizations expose what is in their interests to report. Clearly, large NGOs like FOE and other environmental organizations focus on the most environmentally destructive practices, while human rights groups foreground abuses to indigenous populations but few focus specifically on gender. Local gender issues can be more nuanced and variable depending on location, culture, and the relative strength of the people in a given area. My concern here is highlighting the intersections of gendered macro-level energy policy with state and local micro-level gender regimes and how those detract or contribute to the welfare of women and men.

Another drawback is the dearth of literature backed by solid fieldwork documenting the effects on women of marginalized groups in specific areas of feedstock production. Studies of the effects of agrofuel cultivation on social processes rarely mention race, and gender is folded into the generic category "and women." Where peasant differentiation is observed, peasants are assumed to be male and occupying historically contextualized relations to their environments. However when impacts on rural women are mentioned, they often present women's roles in the domestic/social division of labor as a naturalized, ahistorical fact, even set apart from the general identity of the group to which they belong (Cotula, Dyer & Vermeulen 2008; Gaia Foundation et al. 2008; McMichael 2010).

Accordingly, my lack of on-the-ground firsthand knowledge of the impacts of agrofuels on women in local communities presents an obvious gap in this paper. Drawing on firsthand observation and data collection enables the scholar to speak with people directly and view changes in people's lives and the environment in which they live. It also provides a glimpse into the complexities and subtleties of historic socially and economically constituted activities. And, ideally the work occurs with the permission of the study group and exposes the researcher to the gaze and questions of the subjects such as "Why are you here?" and "Do you presume to speak for me?" However, the strength of this paper is its theoretical synthesis of the available research with gender theory and political economy.

This thesis is dogged by the obvious concerns of insulting or valorizing communities as essentialized, static, and "primitive" and showing the women of those communities to be the silent victims of oppression or "earth mothers" valiantly

preserving the environment. As Salleh has noted (2010) both "free-trade" proponents and their adversaries on the political Left sometimes characterize women and indigenous populations in ways that serve their interests and not those of the affected people. This concern represents the last and most glaring limitation to my work. Long before I began this thesis I asked myself, "Should I write this paper?" with the understanding that my privileged position as a white scholar in the Global North arrogates to itself the authorization to speak for others regardless of their consent and often to their continued or worsened detriment (Alcoff 1996). Certainly, to speak about the people affected by agrofuel capitalism is to expose the "mediated character" (Alcoff 1996, p. 9) of my interpretation.

However, there is also a particular arrogance in choosing not to give these accounts. Alcoff (1996), in her essay, "The Problem of Speaking for Others," observes that believing one can simply retreat from speaking for other people ignores one's embeddedness in networks that affect them. The silence resulting from such a retreat can also represent abandoning responsibility and allowing dominant discourses to fill the gap.

I have observed with growing alarm the continued promotion of agrofuels as a solution to numerous environmental and economic problems. From national policy papers such as President Obama's "Blueprint For a Secure Energy Future," through the websites of celebrities like the Indigo Girls and Melissa Etheridge, down to the local marketing advertisements of Oregon business Sequential Biofuels, the dominant narrative that "we" can shop our way to lower emissions and energy sustainability while "they" get jobs and poverty relief plays against the (ongoing) land grabs, environmental, and food crises of the Global South. Therefore, it is my intent to speak with all the power and

conviction I have, to bring all my scholarly and intellectual resources to bear on this subject, and to accept the criticism and correction of any who know more than I do regarding it.

Literature Review

Most of the literature issuing from UN agencies and international NGOs such as Friends of the Earth (FOE), ActionAid, and the World Wildlife Fund (WWF) focus primarily on the environmental consequences, land grabs, biodiversity loss and increasing hunger where feedstock monocropping exists, yet few analyses of the impacts hold capital to account. And though it is widely acknowledged that women comprise the largest fraction of the world's poor and also the majority of farm labor in the Global South, only one study devotes all of its attention to the impacts on women – a 2008 UNFAO report authored by Andrea Rossi and Yianna Lambrou titled, "Gender and Equity Issues in Liquid Biofuels Production: Minimizing the Risks to Maximize the Opportunities." Rossi and Lambrou's policy paper assesses the gender-differentiated impacts of environmental degradation/loss, socio-economic risks, food insecurity, and employment discrimination attendant with agrofuel production. They predict that the economies of scale necessary for agrofuel feedstock cultivation could erode women's decision-making power with regard to land-use as more of the land they access passes from subsistence into monetized production. Deforestation, desertification, and pollution and loss of water sources are predicted to increase the time and physical burden of household energy provision and management borne by women. Most startlingly,

biodiversity loss and depletion are predicted to result in a dangerous loss of food sovereignty, genetic diversity and traditional knowledge (Rossi and Lambrou 2008).

A year later, Nidhi Tandon (2009) published "The Bio-Fuel Frenzy: What Options for Rural Women? A Case of Rural Development Schizophrenia" in *Gender & Development*. To date, Tandon's article has been the only one to focus on the gendered aspects of agrofuels and also to critique the current development trajectory of "poverty alleviation" through agrofuel cultivation. Tandon's hard-hitting and excellent article is replete with facts about the environmental and social woes stemming from cultivation of the feedstocks, the profit motives of multinational corporations (MNCs), and the misguided development policies that drive monocropping; she even includes accounts of women resisting agrofuel plantations. Despite calling agrofuel development policy "schizophrenic," her conclusion places faith in the market to solve these problems. Exposing the obvious fact that unregulated industrial development "can exacerbate inequalities" (Tandon 2009, p. 110), Tandon counterposes two agricultural systems: those of industrial capitalism's large-scale plantations and the other of small-scale diversified organic farms (Tandon 2009, p. 116). While Tandon certainly understands the issues surrounding agrofuel impacts on women in the Global South, she refuses to specifically condemn capitalism's destructive role in their plight. Instead, she extols the agricultural education of female farmers and their entrance into export markets as well suggesting that socially responsible certifications like Brazil's Social Fuel Seal program and the benefits of organic farming are solutions to inhibit the spread of feedstock monocultures (Tandon 2009). Yet, she fails to acknowledge that certification programs are dependent on volatile international markets. Moreover, evidence shows that commercialization and

mechanization of agriculture generally favors male producers in the absence of economic and social independence for women (Cecelski 2004).

Materialism and Nature

Most radical political analyses chronicling the rise of agrofuel capitalism typically call on conceptions of class or relative economic relations originating in Marxist political economy. In the middle of the nineteenth century Karl Marx laid the foundation for a critique of social relations with regard to material production as opposed to philosophical questions. Marx correctly criticized Feuerbach by stating that sensuousness resides not only in objects but also in human *praxis.* By placing emphasis on the material relations of people to themselves, others and nature, he realistically demonstrated how history unfolds. Accepting the general arguments of his contemporaries regarding conditions under capitalism, Marx advanced a groundbreaking understanding of its history by explaining its dynamic social character. In his *Economic and Philosophical Manuscripts of 1844*, Marx (1978) recalled "man's *inorganic* body" (p. 75) – the interdependence of humans and their environment for the maintenance of physical and spiritual sustenance. By placing emphasis on the material relations of people to themselves, others and nature, he argued that history unfolds through a series of revolutions in the relations of humans to their environment. In his later work, the *Grundrisse* (1978) Marx described this development in three stages. The first stage would be the dissolution of the worker from the soil, followed by the dissolution of the worker's relation to the instruments of labor and finally by the reduction of the worker to the objective conditions of production. Marx

claimed that capitalism deformed the very foundations of its prosperity, nature and labor, by effecting the laborer's estrangement from both (Marx 1978).

While Marx's work lends itself neatly to agrarian political economy, Marxist ecology or ecosocialism emerged out of a new environmental awareness among social theorists. The theory attempts to unite Marx's materialism to an analysis of the ways in which social relations under the capitalist regime impact the environment. Geographer David Harvey (1996) notes in *Justice Nature and the Geography of Difference*, that the various attempts to marry Marxism to an environmentalist project have vacillated between two extremes. In the first case, Marxists dismiss environmental-ecological politics "as a bourgeois diversion" and follow the traditional interpretation of production and the associated class struggle with environment as peripheral. The other approach is to give in to the current popular rhetoric of the environmental movement and to "re-build Marxism-socialism on different theoretical and practical foundations," (p. 92) departing from the grounding in working class political endeavors and activism. However, some of these ecologists use Marx's own philosophical development and textual references to nature to formulate a new analysis that places the environment alongside labor and capital as fundamental categories of analysis (Goldman and Schurman 2000).

The most influential theory to emanate from these new formulations is the concept of the metabolic rift. In his book *Marx's Ecology*, notable social theorist John Bellamy Foster (2000) was the first to show Marx's analysis of industrial capitalism's reach into nature and how its machinations simultaneously exploited labor and nature, rendering both destitute. While Marx is primarily concerned with soil "robbing" whereby the soil is impoverished as value, in the form of nutrients, is transferred from the

country in which crops are grown to urban centers requiring ever-larger inputs of fertilizer to restore the tilth of the soil (Foster 2000), other theorists have extended the analysis to critique agrofuels (Magdoff 2008; McMichael 2009; Otero and Jones 2010). However, these critics' tacit agreement with traditional neo-classical political economic theory, specifically its conception of the production of use versus exchange value, reifies the binary between the public and the private spheres of society, even with regard to nature, and therefore dismisses much of the unpaid work performed by women in and outside the home. By forsaking any genuine attempt to examine this new form of capital accumulation within the context of changing gender relations, the conception of the new proletariat embedded in these critiques remains "resolutely male" (Mackenzie 2010, p. 33).

One of the first radical critiques of agrofuel development from a materialist perspective appeared in the July-August 2008 edition of *Monthly Review*. Fred Magdoff's (2008) "The Political Economy and Ecology in Biofuels" describes the subsidization of ethanol in the form of legislation and agribusiness tax breaks as capital's response to volatile corn prices in the US. Magdoff further notes the contradictions between food and fuel production in the Global South and condemns feedstock cultivation on so-called "marginal" and savanna lands because they support livestock (Magdoff 2008). What Magdoff fails to mention is that many *people* use marginal lands and grasslands and for thousands of *women* around the world these "wastelands" are all they have on which to grow food for their families, graze their livestock, or manage and collect building materials, fuel, and medicines.

Subsequently in 2010, *The Journal of Peasant Studies* devoted all of its pages to critical assessments of agrofuel development. The journal featured several excellent political economic perspectives, notably White and Dasgupta's (2010) examination of the agrarian changes wrought by agrofuels and McMichael's (2010) analysis of their effect on food sovereignty. Stating that agrofuel development may have "unprecedented" (p. 605) impacts on local communities, White and Dasgupta argue for the continued use of traditional political economic concepts and questions to interrogate agrofuel capitalism through the examination of ownership and labor regimes and commodity chain networks. Specifically, they urge scholars to reach beyond the usual technical assessments and extend their analyses to the power relations involved in agrofuel expansion with particular focus on development agencies, corporations, and governments (White and Dasgupta 2010).

McMichael (2010) employs the metabolic rift concept to explain the effects of agrofuel expansion on food "regimes" (historical moments in food production). He specifically calls to account development practices aimed at "poverty alleviation" with the implicit goal of capital's "green accumulation" (p. 615) resulting in depeasantization and the prioritization of capitalist value relations in all aspects of society (McMichael 2010). McMichael's paper condemns the "invisibilisation" (p. 615) of non-monetized social reproduction and the territorial imperative under capitalism to capture it but only briefly mentions the impacts on women with a passing reference to a United Nations paper (Cotula et al. 2008). He fails to mention the report's finding that smallholder women in the Global South perform most of the farm labor and water provision and will most likely suffer the worst consequences of agrofuel capitalism.

Materialism and Gender

Despite the continuing call by feminist and now gender scholars, for more nuanced treatments of capitalist accumulation in agriculture, the majority of critics still adhere to binary categories that obscure the work of women in rural (as well as urban) settings. Writing just the year before McMichael in *The Journal of Peasant Studies*, Shahra Razavi (2009) noted that, while gender analyses have questioned the dominant themes in agrarian political economy, scholars still refuse to seriously engage gender to critique the most important questions of the changing rural landscape. Faulting both neo-classical economists and Marxist critical theorists, she states: "For all the references to 'reproduction', the political economy of agrarian change never seriously considered the relations between the largely feminised unpaid reproductive sphere and the more visible labour and commodities that entered the circuits of accumulation" (p. 198). This is not a new problem.

While Marxist theory's powerful critique of class domination has inspired revolutionary struggles and spawned new fields of critical theory, it has also drawn critics seeking a more inclusive analysis. Marxism's tacit agreement with traditional neo-classical understandings of economic activity, particularly the conception of the production of values, reifies the binary between the public and the private spheres of society and therefore leaves out much of the unpaid work performed in and outside the home. In the 1980's feminist scholars (Hartsock 1983; Waring 1988) challenged Marxism's acceptance of the common understanding of economic value relations that traces its roots to Adam Smith and David Ricardo, among others. They have charged that by refusing to acknowledge the gendered nature of the division of labor and account for

women's unpaid contribution to the economy, traditional and radical economists have tended to overlook the particular concerns of women.

There can be no doubt that Marxist political economy assumes an inherent masculinity in the struggle between the worker and capital. In her book, *Money, Sex, and Power*, Hartsock (1983) points to the manner in which Marxism's preoccupation with the confrontation between worker and capitalist (both male) causes women's particular role in class relations to disappear. She further reveals how gender-blindness in Marx's theory leads him to postulate that all societal conflict stems from class conflict and not other systems of domination such as white supremacy or patriarchy. Marx's emphasis is on the labor power incorporated into commodity production and not on the labor embodied in the direct consumption of commodities for the subsistence of the worker (i.e. cooking, cleaning, etc). As such women's labor, through a theoretical sleight of hand, vanishes from the field of class relations. In *Capital Volume 1,* Marx's chapter, "The Sale and Purchase of Labour-Power" outlines his theory of surplus value explaining that the value of a worker's labor is equivalent to the amount of labor needed to maintain himself and to produce children to replace his labor. Commodities, the fruits of the worker's *objectified* labor, must be sufficient for his children to take his place in the work force when: "The labour-power withdrawn from the market by wear and tear, and by death, must be continually replaced by, at the very least, an equal amount of fresh labour-power" (p. 275).

Hartsock criticizes this and other passages in Marx's analysis of the class relation, because it refuses any outright mention of women's role in the reproduction of labor power and even disregards women's necessary consumption of commodities to sustain

that function. Called "provisioning" (Razavi 2009) the unpaid and invisible work of women in food production, child-care, energy management, and other household labor props up capitalism, yet escapes the light of political economy. The gender-blindness that Marx employs in his theory of economic relations featuring the public struggle of the male worker vis-à-vis capital obscures the value of women's labor and clouds Marx's analytic power to conceive of the different ways in which women's worth as unpaid laborers could be examined. Waring (1988) criticizes Marx's successors in the field of political economy whose preoccupation with the separation between so-called reproductive labor, and that which has exchange value, relegates women's unpaid labor to the realm of "housework." Accordingly socialist feminist Lise Vogel (1983) observes that the spheres of necessary labor and surplus production lose their specificity and distinction when practiced in real life, such as in agricultural societies.

Just as feminist scholarship produced detailed examinations of Marxism's promise and shortcomings regarding the oppression and liberation of women with regard to labor and value, the new feminist environmentalists advanced their own critical appraisals of its efficacy in matters of environmental degradation. Following on a parallel track with environmental social theory, feminist scholarship also began to incorporate environmental concerns into its project. The emergence of "ecofeminism" grew out of feminism's attempt to interrogate women's oppression and its connection to environmental destruction.

The moniker "ecofeminisme" was coined by Francoise d'Eaubonne, a French writer who called on women to save the planet from destruction (Merchant 1995, p. 5). The concepts embodied in ecofeminism emerged in the mid-1970's and '80's (Sturgeon

1997, p. 25) as greater awareness of environmental problems crept into the consciousness of the Global North, and as feminists began linking spirituality, anti-militarism, environmentalism, and women's activism into a loose collection of principles connecting the salvation of Earth with women's activism (Sturgeon 1997, p.182). Ecofeminist theory identified the shared features of patriarchy and capitalist exploitation of the environment (Merchant 1995, p. 7) as well as that of women, people of color, and children (Warren 2000, p. 1). Another aspect of the theory was an emphasis on the "connection" between women and nature and of a holistic spirituality between women and the earth (Merchant 1995, pp. 3 - 5).

The ecofeminist response to Marxist ecologists restates some of the same arguments that Hartsock puts forward but it refashions them with an emphasis on women's special connection to nature (Cuomo 2001, p. 150). Ecofeminism seeks to break down the dualisms of subject/object, culture/nature and human/non-human. A core criticism ecofeminism levels at Marxian analysis is that its reliance on the Hegelian dialectic guarantees that all conceptions of natural and social processes reify the concept of struggle inherent in arguments that position women and nature as subordinate. This Enlightenment idea, they claim, imposes a wedge between women and the environment, because it recreates the duality of forces inherent in modern science and technology (Mies and Shiva 1993, p. 5). The most prominent ecofeminist to challenge ecosocialism with regard to gender is Ariel Salleh. While I agree with Salleh's assessment of ecosocialism and liberal feminism, I find her arguments positioning women (particularly "mothers"), "indigenous" and other marginalized people as a privileged class problematic. She is right to identify the invisible work of women, peasants and

indigenous people as worthy of value, however she engages in a dangerous universalization that excludes the dynamic movement of identity and culture. In many cases, cultural understandings of the supposed "connection" of women, and indigenous people to nature are rigid justifications for dominant economic and domestic divisions of labor that carry negative material consequences for the people involved.

Salleh (1997), in her book *Ecofeminism as Politics,* critiques both feminism and Marxism for their passive acceptance of the Enlightenment-based separation of women and nature. She argues that the tendency of both traditions to uncritically embrace the subject/object relation and ground their theories of liberation in opposition to that binary simply reproduces the problem of dichotomies and obscures a liberatory ecology, one that recognizes the connection of women to their environment (p. 13 and p. 70). She argues that Marx's prioritization of productive labor and omission of reproductive labor from his political economy consigns women to nature not history (Salleh 2001, p. 447). While commending "eco-Marxists" for their tendency to be more deeply reflexive in their scholarship, she nevertheless insists that eco-Marxists reorient their thinking to apprehend the "deepest contradiction" underpinning the capitalist organization of production and the division of labor through privileging reproduction of material life in their theory-making. She goes on to say that the deepest contradiction is materially embodied in masculinist theorizing that leads to the abstraction of the consuming industrial process. Salleh points to what she calls "meta-industrials" who are the "classes" excluded by the Marxist preoccupation with industrial production. The meta-industrials are those that engage in reproduction; their ranks are filled with domestic

caregivers, indigenous hunter-gatherers, and peasant farmers. She claims this class of people appropriates nature in "precautionary ways" (Salleh 2001, p. 448).

In her 2010 article, "From Metabolic Rift to 'Metabolic Value': Reflections on Environmental Sociology and the Alternative Globalization Movement," Salleh takes up Foster's metabolic rift theory while recalling the predicament facing many Northern feminists who find it difficult to identify their labor in the "mediation of nature on behalf of men" (p. 208) because of the association of women as ideologically synonymous with nature. Criticizing progressives in general, including feminists, she goes on to say that, while they may reject capitalism, they are often materially dependent on it and thus the power of their arguments is undercut by the capitalist nature of the production of knowledge, as it mirrors the commodity form (p. 211). Returning to metabolic rift theorists, ecological economists, and world systems theorists, Salleh warns that their work threatens to gloss over local cultural differences and the "sex-gendered" (p. 207) nature of capitalism. She calls for a re-valuing of the work of small farmers, peasants, gatherers and mothers. Salleh's argument is difficult to escape, however her romanticism of "subsistence" labor performed by marginalized peoples fails to critique the oppressive circumstances under which they live and struggle to overthrow.

While Salleh's argument is compelling and provides an excellent basic framework for conceiving of agrofuel capitalism's effect on women in the Global South, there is a lack of specificity in her work, as well as a static quality that valorizes certain categories while ignoring their multiple contingencies. Salleh's contention that women and indigenous people are often conservators of biodiversity whose agricultural practices maintain the integrity of the metabolic relation between humans and the earth and whose

knowledge must be valued is provisionally correct. I say "provisionally" because in her attempt to include "meta-industrials" she seems to view the designations of "women", "indigenous", "peasant" and so on as stable categories when in fact they are constantly being renegotiated as communities change, not simply as a result of capitalist influence, but also in relation to calls for change from within and historical, cultural, and environmental developments from without.

Her work critiques capitalism's environmental vagaries but speaks of "mothers" (p. 207, p. 208 and p. 216) as the category of women with the most privileged knowledge of biodiversity. In fact, in the Global South, work is often distributed among women (and men) depending on age, familial, and fertility status (Razavi 2009, p. 206; Waring 1988, p. 167); knowledge of biodiversity may also be mediated by gender relations that privilege men and men's priorities such as control over the reproduction of the women in the community. Women who are mothers often rely on their young female relatives as well as sons and daughters to provide the labor necessary for the family's survival. Additionally, in many cases, the meta-industrials of which she speaks are living on marginal lands they were forced to inhabit during colonization. The landscapes are often desolate, and the people perform whatever labor they can to survive including charcoal production, herb gathering for the market, the sale of milk and meat products, and crafting for the marketplace.

When Salleh does speak of resistance to capitalism, it is not of the women who are attempting to negotiate the complicated social relations *within* their communities that restrict their mobility and wellbeing. She ignores the very active work of women in the powerful peasant organizations - *Movimento dos Trabalhdores Rurais Sem Terra*

(MacKenzie 2010) and *La Vía Campesina* (Vía Campesina) – to be treated equitably within their ranks. It is as if those organizations presented an uncomplicated and uniform identity untainted by gender, cultural, or racial politics.

She refuses to interrogate the gendered nature of customary relations that privilege married women over those who are unmarried, "divorced" (in Western parlance) or widowed with regard to land and natural resource access. And while she seeks to overthrow capitalism, she does not also call for the destruction of the gender and race oppressions that position the meta-industrials at "the base of the accumulation hierarchy" (p. 207) in the first place. To do so would upend the very basis of the "privileged" knowledge they have and force a true assessment of metabolic relations. In short, Salleh's work, no more than the frameworks she critiques, eschews a feminist political ecology, one that recognizes that gender oppression, racism, and capitalism stand on their own as separate but intersecting social structures and sites of struggle (Hill Collins 1995; Martin 2004; Risman 2004) and that the relations within them are constantly changing.

Towards a Feminist Political Ecology of Agrofuels

This paper agrees with many of Salleh's assumptions with regard to women's marginalization in ecosocialist theoretical work. However, it attempts to locate itself in the traditions of feminist political ecology, which recognizes the social, economic, and political relations regarding gendered environmental relations and management (Rocheleau et. al. 1996) and feminist environmentalism which takes a materialist approach to gender relations and environmental access/resource use (Schroeder 1997).

For the purpose of this thesis, the framework can simply be called a "feminist political ecology."

While this work critiques the basic premise of metabolic rift theory with regard to gender, it refuses to advance a totalizing view of agrofuel capitalism by adopting a world-systems approach, nor does it lapse into meaningless relativism by highlighting only local impacts. Instead, this thesis attempts to achieve the type of vision Haraway (1988) terms "partial perspective" (p. 584) by focusing not only on the global aspects of agrofuel development but also drawing on local stories to provide evidence for my claims.

For this reason, I call on the work of gender scholars. Feminist theorists and gender scholars have sought to address the schism in critical theory between macro and micro levels of analysis. Specifically, they interrogate the role gender plays, not only in identity formation, but also in the culture of institutions. These scholars have challenged radical political assessments for their acceptance of the common macro-level understanding of economic relations and disregard of the gendered nature of the division of labor present in nearly all cultures (Acker 2004; Waring 1988).

The racial and gender prejudices and assumptions embedded in agrofuel development, in addition to destroying the local environment and the manner of subsistence for many communities, disrupt gender relations forcing women and men to renegotiate their roles. In this retooling of social relations, women's social and material circumstances weaken. Capitalism's indisputable preoccupation with and formalization of productive, rather than so-called "reproductive," capacities favors men by reshaping their locally constructed masculinities (Acker 2004; Connell and Messerschmidt 2005; Jessop 2003). And by reinforcing men's productive role in the market, women's

considerable involvement in the preservation of biodiversity and food production is excluded from analysis (Howard 2003; Salleh 2010). Therefore, it is important to recognize the local character of gender and the ways in which it influences the division of labor, rights to land, and the conception of work. Gender theorists propose that there are multiple "hegemonic" masculinities and femininities (Acker 2006; Connell and Messerschmidt 2005; Jessop 2003) contingent on local and historical conditions and that these gender "regimes" (Jessop 2003) or "orders" (Connell and Messerschmidt 2005), when influenced by capital and state organizations, spawn new contradictions and reformations. Additionally, Acker (2006) argues that "extra-local" places are local for the managers and bureaucrats who operate within them, thus macroeconomic agents such as the World Bank, agrofuel corporations, the UN and others impose their own gender cultures on local communities. Marxist and feminist academics and activists in the Global North are no different: lacking the necessary local knowledge of women and men in specific locations in the Global South, we are left to draw on narrative and case studies to understand gender relations in particular locations (Acker 2006; Haraway 1991; Martin 2004).

The contention still remains that under agrofuel capitalism economic security, health, and decision-making capacity for women in smallholder and indigenous communities will be significantly diminished. However, it is not enough to say that large-scale agrofuel plantations will destroy ecosystems, augment poverty, threaten food sovereignty, and displace pastoralists, smallholders, and particularly the poorest women and men of those communities resulting in the loss of their traditional ecological knowledge. They will do all that, not only because of the inequitable economic relations

between North and South, but because the economy supporting the fuels' development reaches deeper into nature for "solutions" to its crises. Employing the narrative that agrofuels can be grown on exhausted or "marginal" land, capitalism treats the unquantifiable value of nature as a free gift to be "improved" by employment in feedstock cultivation. Yet, non-market activities of the people who use the land, particularly women, are not seen at all – they remain invisible.

CHAPTER II

LIFTING THE VEIL

Agrofuel production represents capitalism's force as an environmental agent in its own right (Moore 2011) as it seeks new ground by extension of and through the North's own metabolic rift. Foster (2000) was the first theorist to show that Marx's examination of capitalism was also an account of its environmental impacts as he recognized that human beings sustain themselves through the appropriation and transformation of nature in a process that is at once consumption and production. Naming this universal metabolic relation *Stoffwechsel*, Marx (1990) described the process whereby human beings bathe the material body of nature in the "fire of labour" (p. 289), transforming it into products with various use-values vital to the sustenance of human life and reproduction. This fiery baptism sears into each item a dual character as both the result and the condition of labor, a purposeful activity, supplying people with products for consumption or further production. The "metabolic rift" (Foster 2000, p. 155) refers to the irreparable break between humans and the environment entailed by commodification. The interruption of *Stoffwechsel* destroys the natural environment and displaces the humans who practice it while producing commodities for sale.

Through the process of commodification the use-value of a product undergoes a transformation of its former self, transcending its singular sensuousness and taking its value from the social relation of objectified labor. Commodities cease to be accessible materials formed out of nature by direct human interaction and instead derive their importance from the *separation* of the producers from their natural environment, from the products of their labor, and from one another. This exchange value obscures a product's

direct utility to people, endowing it with a mysterious life of its own. The predominance of social relations mediated by and through commodities appears both mystical and, at the same time, natural, as if it sprang of its own accord out of human society (Marx 1990, p. 163). The market dominates the discourse about the interactions between humans and nature and among people by constructing narratives that finesse their identities as consumers. Capital selectively enlists the scientific community in the business of knowledge production and message framing. The logic underpinning agrofuel promotion employs crisis narratives and neo-classical economic valuation to justify development of plant-based fuels and increase the public's acceptance of the alliances formed among the auto, oil, financial, chemical, and seed companies. Raising the real crises of climate change and biodiversity loss, the industry draws on false dichotomies to perpetuate capitalist accumulation and advances a "solution." Thus just as the *Golem* arose from a lump of clay to assume a living human form, capitalism's whispering endows products of objectified labor with fantastic autonomy enabling them to eclipse their humble origins and speak for themselves.

In the conversation of the market those items and activities without exchange value cannot speak. The unpaid work people do to maintain themselves, their households, their environments, and their communities is rarely seen and almost never heard. Capital treats this provisioning as a free gift to be exploited. Moreover, as Waring (1988) and Salleh (2010) argue, the work of indigenous people, particularly women, is invisible because they do not contribute to Gross Domestic Product (GDP) or other monetary indicators, yet their reproductive labor sustains capitalism by providing crucial maintenance of the natural environment and human beings. Over the last twenty or more

years we have seen the lowering of real wages, financial crises, the concentration of wealth in fewer hands, and cutbacks to the social safety net. Against this backdrop a greater number of women in the Global North are performing waged labor than in any time in history. In addition to their jobs, the domestic division of labor requires more energy use as they drive to do grocery shopping, kid pick-up, and perform other tasks.

Agrofuels extend the confrontation between labor and capital by pitting the unpaid labor of women in the Global North against that of women and men in the Global South. While touted as a "solution" to fuel consumption, agrofuels are simply a backdoor to further capital accumulation and exploitation of the South's natural resources and people. Moreover, this greed for energy "solutions" extends the perversity of the market by rendering the provisioning of women in the South more arduous by depriving them of even the low-grade and dirty fuels they use for their domestic and market labor.

Cathy and Tendai: The Invisible Energy Managers

Marilyn Waring (1988), in her examination of economics, tells a parable about two very different people: Cathy and Tendai. Cathy is a "middle-class North American housewife" (p. 13) who occupies her time grocery shopping, preparing and serving meals, washing her family's dishes and laundry, making beds, teaching and caring for her children, sweeping and vacuuming floors, cleaning the bathroom and kitchen, and performing other household work. Tendai is a "young girl in the Lowveld, in Zimbabwe" (p. 13) who begins her day at 4 a.m. carrying water, then going out again at 9 a.m. to fetch firewood, coming home to wash dishes, helping to prepare food for the family meal, then venturing out to gather wild vegetables, helping to cook the evening meal, and

eventually ending her day at 9 p.m. when she helps put her younger siblings to bed. Cathy and Tendai could not be more different, but they share three things in common: they are both female, they both are performing housework, and they are both completely "unproductive" as far as the market is concerned.

While Waring's characterization of Cathy and Tendai, like all parables, is a highly rigid universalization of women in both the North and South, her point is that current economic models do not account for the gendered division of labor and resource allocation. Benería (2003) reports that UNDP 1995 "rough estimates" for the global level of unpaid labor, valued at 2003 prevailing wages, would amount to $16 trillion[3]. Women contributed almost 70 percent of that $16 trillion, an estimated $ 11 trillion (Benería 2003, p. 74). Waring goes on to show argue that the "production boundary," the sphere that encompasses the measurable exchange of goods and services, excludes both the unpaid labor of women and also the unquantified and incalculably important environmental "services" nature provides. The market appropriates the silent, valueless reproductive labor of nature, indigenous men and women and women in the industrial North as "free gifts" and degrades them in the process. In the film adaptation (1995) of her book, Waring exhorts women to invent job titles and descriptions reflecting the true value of their labor. Certainly one of the main descriptions Cathy and Tendai could add to their resumes is "energy manager." The household work that women do, in both the North and South, consumes large amounts of energy. While the gendered division of household labor consumes the temporal physical and mental capacities of women in both hemispheres, they are by no means equal in the eyes of capital. Cathy and Tendai's

[3] Women contributed about 70 percent of the $ 23 trillion world total output (Benería 2003, p. 74).

shared invisibilities with regard to labor and resources diverge and become adversarial in the realm of energy planning and policy. In fact, Cathy's average annual energy consumption is roughly 18 times that of Tendai's (Gaye 2007, p. 2)!

Historical capital accumulation and exploitation of its own natural resources as well as those in the South has enabled the North to develop well-established energy and water networks ensuring its citizens relatively comfortable lives free from drudgery and disease. In the South, the legacy of imperial extraction has resulted in a lack of energy infrastructure and rural poverty forcing people to rely on low quality fuels that place multiple costs on the women who carry and burn them. While promoted by governments in North and South as clean energy that will improve the lives of people in the Global South, the dispossession, environmental destruction, and social disruption stemming from these high-tech fuels will further impoverish the invisible female energy managers in the South.

Tendai's Invisible Production

In the Global South where rural women are generally dependent on informal energy systems, their unpaid labor not only consumes the calories embodied in the biomass they use to supply their households but also their own physical capacities as they gather and carry it back to be used in their homes. Cecelski (2004) states that following the 1973 oil crisis stemming from the OPEC embargo, the realms of energy policy and research separated and gradually embraced questions of pricing, conservation, and fuel substitution as areas of importance with regard to energy savings and balance (p. 6). While this was true on a global basis, the countries in the Global South found that their

"energy crisis" was in large part due to the fact that nearly 50 percent of their citizens, both rural and urban, consumed low energy density biomass, with the fuel accounting for almost 90 percent of total household energy consumption in Africa and Asia.

Moreover, women and children act as *de facto* energy suppliers and managers through the use of their unpaid labor in the provision of household fuel in a complex web of economic/social relations linking forestry, water provision, biodiversity maintenance and degradation, agricultural, and even industrial processes. All of these are affected by agrofuel development. Cecelski goes on to say that the use of biomass and of the household energy sector remains "invisible" (p. 6) in energy planning and policy. Doing laundry, grazing and watering livestock, visiting the market to sell vegetables and buy food, fetching water and wood is also invisible because it burns up hours and metabolic energy. A study of the gendered division of household labor from eastern Zimbabwe found that women did 91 percent of the firewood collection and water fetching, spent a combined 13 hours and a total of about 4,000 food calories per week on just those two household chores (ENERGIA 2006).

Additionally, the energy consumption of poor women in the Global South is invisible not only because of the persistent gendered division of labor that burns up their time and physical energy but also because of the type of energy consumed. Wood, charcoal, field stubble, and animal dung are generally collected, traded, and consumed in informal settings and arrangements, effectively evading definitive economic valuation. In the Global North, energy is quantified, priced, and evaluated in order to carry out planning, policy, and strategic decisions.

Cathy's Quantifiable Consumption

A 2008 Gallup Poll of over 590 married heterosexual couples in US found that 53 percent of the grocery shopping, 48 percent of the dishwashing, 58 percent of the meal preparation, 68 percent of laundry, 61 percent of the housecleaning and 54 percent of the childcare was performed by women (Newport 2008). Yet, while the market refuses to count women's time-use, it quantifies with ease the energy use resulting from it. Due to their domestic chores, women in the North have seen their automobile (Kay 1997) and public transportation (Crane and Takahashi 2009) use rise. Research of a twenty year period in the US between 1985 to 2005 found that, contrary to the common notion that women's car travel was shorter overall because of the gendered division of household labor, the gap between men and women had narrowed. The study also found that "Black" and "Hispanic" women were driving significantly less than white women but were also taking public transportation for much longer durations than their male counterparts; Black men were commuting less than men of the other two categories (Crane and Takahashi 2009).

The foregoing information shows, not surprisingly, that women use more energy in conducting their day-to-day business than their male counterparts. All of that electricity and petroleum use is counted, because in the Global North, units of oil, coal, and natural gas are metered, purchased, and paid for regardless of how they are consumed. Additionally, a culture that favors individual car ownership accounts for longer hours in the car and higher fuel consumption (Kay 1997). Yet, it is not the Cathys or Tendais who are driving energy policy and research development.

The Real Drivers: Strategic Alliances

"There's only one thing that the ruling interests have ever wanted. And that's everything." – Michael Parenti[4]

The global extraction serving capitalism depends on maintenance of production in both hemispheres, however the social and environmental costs associated with petroleum drilling and refining presents capital with challenges and opportunities. Undeniable evidence of global climate change, local environmental and social costs, rising resistance among people in fossil fuel-rich areas in the Global South, and Northern environmentalists' demands of accountability all necessitated the reworking of capitalism's myths. Agrofuels provide a convenient avenue for the oil industry to advance accumulation while forming partnerships to maintain its viability beyond peak oil and extend its greed farther into the Global South. Moreover, the ongoing destruction associated with agrofuel feedstocks does not capture the attention of the public like an oil spill.

Lacking the troubling images of drilling among caribou, oil spills in the ocean, or gas flares turning the sky black, agrofuels are touted as clean, renewable energy sources. Oregon-based Sequential-Pacific Biodiesel's (2012) website carries the motto "Advanced technology for high quality, low impact fuel," extolling the sustainability of plant-based transport fuels. The company began operations in 2005 refining used cooking oil from local restaurants and food processors to make transport fuel. Diesel production rose to 17 million gallons by 2012, necessitating the inclusion of canola oil, since, according to the firm's founder Tyson Keever, all the used cooking oil in Oregon

[4] Big Noise Films, et al. (1999).

would only account for 3.2 million gallons of diesel (Stiles 2010). The company is a member of the Sustainable Biodiesel Alliance (SBA), a non-profit organization that supports "community based" diesel production and whose founders and supporters include the celebrities Daryl Hannah, Willie Nelson and Woody Harrelson. Community based production involves sourcing and refining feedstocks locally rather than importing them. While the small producers who form SBA pledge to follow sustainable methods, they will not have a substantive impact on environmental, social, labor and food concerns in rural communities in the North or the South, as their affiliates lack the economic clout of agribusiness giants who control the start to finish processing (GRAIN 2007). Keever acknowledges that agribusiness giants Archer Illinois-based Daniels Midland (ADM) and Minnesota's Cargill supply Oregon with most of the agrofuel to offset the 720 million gallons consumed in the state (Stiles 2010). Capitalist competition and the integration of the global food and fuel markets favor MNCs who owe allegiance only to their shareholders and can deliver more and cheaper product while achieving vertical integration. Moreover, the environmental and economic crises provide new narratives to fend off critics. Small producers deliver a loyal market of "conscious" consumers and burnish the credentials of the fuels, paving the way for the big companies. For instance the SBA's website addresses the concern of indirect land use change by noting that destruction of the Amazon rainforest has been steadily dropping since the introduction of agrofuels (SBA 2012). What the website does not mention is that, following international denunciation surrounding the loss of the Amazon, much agrofuel cultivation shifted to Brazil's *Cerrado*, which proponents claim is a "wasteland" (Avery 2006; Klink

& Machado 2005). Such claims hand agrofuel companies convenient advertising points in their drive to burnish damaged images.

After years of waging war against the growing body of evidence verifying the existence of climate change and its connection to burning fossil fuels, oil companies began re-branding themselves to adapt to this new reality. British Petroleum is one example. In 2000 BP abandoned its green shield and adopted a bright green and yellow "Helios" (after the Greek sun god) to reflect its new mission: 'better people, better products, big picture, beyond petroleum' (BP 2011). Seven years later BP linked up with public universities to create the largest industry-funded academic body in US history, The Energy Biosciences Institute, a $50 million/year partnership between BP, the University of Illinois, and Lawrence Berkeley National Laboratory. The lab's mission is to "explore the application of advanced knowledge of biological processes, materials and mechanisms to the energy sector." EBI's research areas include "feedstock development, biofuels production and fossil fuel bioprocessing" among others (EBI 2011; Holleman and Clausen 2008).

The petroleum companies followed a phalanx of powerful seed, chemical, and grain processing corporations who were actively searching for new ways to diversify their portfolios amid sagging profits. Together ADM and Cargill control 75 percent of the global grain trade while the US-based chemical giants Monsanto and DuPont, along with Swiss seed and pesticide company Syngenta, control close to half of the global hybrid and genetically modified (GM) seed share, but these companies were able to realize new prospects as agricultural prices began tumbling (Altieri 2009; GRAIN 2007). The agribusiness sector forged agreements with oil and car companies providing them with an

opportunity to rehabilitate their reputations, tarnished as they were by reports of melting icecaps and drowning polar bears, by promoting their "green" credentials while reaping hefty profits. To that end Monsanto, the manufacturer of Roundup, partnered with ADM and Conoco-Phillips while BP cooperated with DuPont and Toyota along with Monsanto and Mendel Biotechnology. Investment firm Goldman-Sachs rounded out a partnership that consisted of Royal Dutch Shell, Cargill, and Syngenta. This agroindustrial Hydra eliminates all the obstacles traditionally associated with agriculture by capturing both ends of the production cycle. Genetically modified seeds, chemical fertilizers, and pesticides are produced and sold to farmers at the beginning of the cycle while the product is refined and sold to consumers as "biofuel" at the end (Holt-Gimenez and Shattuck 2009).

The companies wasted no time cultivating politicians and environmental organizations in their quest for new markets. Since 2000 ADM has contributed an estimated $ 3.7 million to state and federal politicians (Holt-Gimenez and Kenfield 2009). Holt-Gimenez and Kenfield (2009) report that the company donated $1 million to Kansas Senator Bob Dole and other Republicans during the 1992 election. Dole returned the favor by helping the company garner billions of dollars in subsidies and tax breaks. As scientific evidence began to emerge revealing the detrimental social, environmental, and economic impacts of crop-based fuels, capital enlisted environmental and labor groups to preserve the narrative of agrofuel "sustainability." In November 2006 the Swiss university École Polytechnique Fédérale de Lausanne convened the Roundtable on Sustainable Biofuels (RSB) whose original members included BP, Shell Oil, Petrobras

(the Brazilian oil and ethanol company), Bunge, and the World Wildlife Fund (WWF) (Shattuck 2009).

On the 23rd of March 2011, the RSB released its plan for voluntary third-party certification after consultation with over 120 organizations including farmers, refiners, non-governmental organizations (NGOs), and retailers. At the unveiling of standards, Elizabeth Bramble of the National Wildlife Fund (NWF) and RSB's Steering Board Chair stated, "Now we look to the marketplace to recognize industry leaders who are getting it right by producing biofuels that benefit both people and the planet" (Maestas 2011). Shattuck (2009) points to the past performances of other voluntary standards set forth by industry, social, and environmental partnerships for a glimpse of what is to come. In all cases, certifying bodies like the Roundtable on Responsible Soy (RRS), the Roundtable for Sustainable Palm Oil (RSPO), and the Forest Stewardship Council (FSC) have been accused of illegal forest destruction and land deals as well as horrific labor abuses and land conflicts (Shattuck 2009). In fact on the 7th of April 2011, IOI Corp Bhd, Malaysia's second largest oil palm plantation owner and a major exporter of agrodiesel to the European Union with refineries in the Netherlands, was accused of illegal deforestation and land conflicts (Milieudefensie & FOEE 2010). Others have documented how WWF, the Sierra Club, NWF and other environmental groups have given their stamp of approval to products and extractive practices or engaged in "fortress conservation" in exchange for hefty donations (Hari 2010; Kelly 2011; McGahey 2008). What has resulted from these alliances is commonly known as "greenwashing," a process whereby companies profit while maintaining an environmentally friendly image by association with well-known environmental organizations.

Leveraging the "Worried Well"[5]: Agrofuel Fetishism

The market, in the form of researchers, policymakers, corporations, finance institutions, and politicians, is employing a number of methods to increase public support for agrofuels through messaging stressing their importance as "green energy" choices with regard to "peak oil," climate change, and energy security crises (Van de Velde, L., Verbeke, W., Popp, M. & Van Huylenbroeck, G., 2010, p. 5541). Researchers in agricultural economics are taking note, not only of the gendered decisions regarding car ownership, but also of the message framing necessary to promote agrofuels as an alternative to petroleum. One of the more interesting documents in this vein is a study acknowledging European women's car purchase decision-making and stressing the need "educate" consumers by avoiding revealing the drawbacks of agrofuels and advancing a positive image (Van de Velde et al. 2010, p. 5547).

In their 2010 study, Van de Velde et al., of Belgium and the US, restated that women in the Global North have considerable influence in car purchasing, and their identification as potential consumers poses an "enormous growth potential" (p. 5547) that remains untapped by the automobile industry. However, the scope of their research mainly focused on how to pitch agrofuels to consumers to increase "concern" for climate change and "perceived consumer effectiveness" (PCE) (p. 5542) in the form of consumption of agrofuels. The sample of 260 adults in the Flemish region of Belgium found that the men in their sample responded with more concern when addressed with a "negative" message stressing the "incalculable" (p. 5548) consequences for the global

[5] DuPuis, E. M., Harrison, J.L., & Goodman, D. (2011), p. 296.

community unless energy efficient technologies and agrofuels were adopted but that their concern did not translate into effective PCE - a belief that their individual consumer actions make a difference. However, they also found that a positively worded message stressing the dangers of climate change but advancing solutions through the adoption of "biofuels" and fuel efficient vehicles not only caused a large amount of concern for the environment among the women sampled, but also translated into positive consumer action. The authors concluded that:

> For people who have a less positive perception of biofuels, who show less involvement and who express lower knowledge and a perceived lack of information about biofuels, the perceived consumer effectiveness is increased when the possible solutions of the energy and environmental problems are stressed within the message. Although, this type of message will also increase their level of concern, the risk to present the problem as insoluble is small because also an increase in PCE will be realised.[6]

This research appeared in the pages of the journal *Energy Policy* as charges of environmental unsustainability and the financial crisis of 2009 plagued agrofuel companies and their financiers. Nevertheless, promoters of the alternative fuels could take solace in their powerful new alliances, the certainty of a rise in oil prices, and market receptivity among the "worried well" -- environmentally-conscious white people (DuPuis, E. M., Harrison, J. L., & Goodman, D., 2011, p. 296). Promoting the "sustainability" of agrofuels is particularly effective in light of the current, yet often unreflective, discourse in the food, climate justice, and anti-globalization movements (AGM) sweeping the Northern countries.

The racial and class conceptions of locally produced agriculture, heirloom seeds, and backyard organic gardens neatly articulate with the essentialist rhetoric of

[6] Van de Velde, L., Verbeke, W., Popp, M. & Van Huylenbroeck, G., (2010), p. 5547.

ecofeminist Vandana Shiva (2007) and others (Salleh 2010) whose populist condemnations of corporations and runaway consumption play especially well with progressive whites in the North. Shiva's vigorous rejection of modernity draws on Hindu spirituality and "maternal feminism" (Cochrane 2007, p.176) to glorify the "embeddedness" of indigenous peoples, particularly women, in nature while refusing to interrogate the inequitable interplay of class, caste, and gender (Cochrane 2007; Nanda 1997) among various groups.

Lavin (2009) and others (DuPuis et al. 2011; Holt-Giménez 2011) have noted how local food organizations and activists, while espousing astute anti-corporate/anti-capitalist sentiments, locate their discourse in the area of consumer choice rather than critiquing cross-cutting issues of race, class and geographical location. Additionally, from a feminist perspective, Cochrane (2007) and Nanda (1997) observe that progressive and radical academics and activists' uncritical acceptance of non-Western social and material inequality in the name of spiritual and cultural difference hands global capital a legitimacy it could never have dreamed of.

Ecofeminists such as Salleh and Shiva ignore how this more savvy and flexible capitalism exploits local inequalities for its own gain, particularly the unpaid work of women. Instead they castigate Northern intellectuals for owning washing machines while extolling the "joy" (p. 215) of the backbreaking work of poor rural men and women and their "special knowledge" of the environment that stems from their impoverishment as "life-affirming" (Salleh 2010, p. 212). Moreover, the simultaneous glorification and wholesale acceptance of "indigenous" and "women" as essential positions, rather than as intersecting institutional categories with material embodiments that are also sites of

internal contestation and renegotiation, glosses over historical inequalities, struggles, and negotiations among and within those groups (Cochrane 2007; Hecht 2011; Pye 2010) and denies them the ability to voice to any opposition to this idealized image. The populist rejection of *all* development as imperialist and patriarchal unconsciously opens the door to homegrown discrimination and capitalist expansion. Pye (2010), for example, notes that Vía Campesina and other agrofuel opponents' framing of the fuels as "neo colonialism-imperialism" (p. 869) and their lack of a transnational strategy omits examination of dominant Southern companies and their exploitation of transnational migrants in agrofuel production. However, as Nanda (1997) recognizes, the new global capitalism is no longer the "predatory West" but an "authentically global abstraction" (p. 366) that is fluid and flexible geographically, economically, politically and culturally. And agrofuel proponents are listening carefully and adopting various indigenous sayings, theological perspectives, and values to put forward an image of the fuels as markers of "sustainable" consumption and promoters of economic development. Nothing could be further from the truth.

Linking Food and Fuel

Currently, the trajectory of countries in the Global South, with the financing of large banks and corporations in both the North and South (Brazil, Indonesia, India, China and Malaysia), and the facilitation of development agencies and NGO's is to identify suitable land on which to grow energy crops for local use and to meet the renewable fuel mandates in the growing Southern economies as well as the Global North. However, integration of food and fuel into a single global market, high subsidies for agrofuel

production, and “free trade” agreements have contributed to rising food prices that disproportionately affect the poorest people in the world (Pahl 2005). From 2001 to 2007 worldwide ethanol production more than doubled rising from 20 billion liters to 50 billion liters, while agrodiesel output grew from 0.8 billion liters to nearly 4 billion in the same six year span (Banse, 2007; Tenenbaum 2008). As food riots in Haiti, Cameroon, Côte d'Ivoire, Burkina Faso, Egypt, Somalia, Senegal, Mexico, and Indonesia rocked the globe in the spring of 2008, the rich nations went on the defensive. German Chancellor Angela Merkel, whose country is Europe’s largest producer of biodiesel, blamed the poor nations for their woes:

> "If you travel to India these days, then a main part of the debate is about the 'second meal'...People are eating twice a day, and if a third of one billion people in India do that, it adds up to 300 million people. That's a large part of the EuropeanUnion...And if they suddenly consume twice as much food as before and if 100 million Chinese start drinking milk too, then of course our milk quotas become skewed... (Heller 2008.)”

Her US counterpart, President George Bush, admitted in an interview that food prices had risen but also noted that the middle class of India had grown to more than 350 million and so was placing a strain on the world’s food supply (Gerstenzang 2008).

Robert Zoellick, president of the World Bank, warned G-7 finance ministers gathered in Washington that food prices had risen too rapidly for people in the poor nations to feed themselves. In two months the cost of rice jumped 75% while wheat rose 120% (CNN 2008). But at the U.N. Food Summit in Rome, Brazil’s president Lula da Silva and U.S. and European delegates fought back attempts to place a moratorium on agrofuels, claiming food prices are not linked to fuel. Before the opening of the summit, the leaders of their agrofuel industries warned FAO director general Jacques Diouf not to raise concerns about the food-fuel link. He ignored them and asked how $12 billion could be

spent on agrofuel subsidies and 100 metric tons of food could be diverted from human mouths to feed vehicles (Borger 2008). Rejecting Diouf's and others' protests, the U.S. Secretary of Agriculture claimed that agrofuels accounted for "only" 3% of the world food price hikes. At the conclusion of the meeting UN Secretary General Ban Ki Moon deferring criticism of the US's $11 billion agrofuel subsidies, instead called for a "greater degree of international consensus" on agrofuels (Wilkinson 2008). Yet, despite the fact that women perform the majority of the agricultural activity under arduous conditions and often on marginal or degraded land (Rossi & Lambrou 2008), the governments of the South eagerly began inventorying their marginal land, supported by their agribusiness sectors and local NGOs. Diversion of arable land to energy cropping is having a negative impact on food security because, in many regions, women cultivate staples for the household and also for market. The prioritization of agrofuel crops has resulted not only in hunger but also in women's loss of authority over land-use decisions particularly over the marginal areas they are often forced to access for income supplementation (Tsikata & Yaro 2011).

CHAPTER III

GREENWASHING THE METABOLIC RIFT

"The *Maasai* maintain that all humanity derives its spirit from Mother Earth, and therefore that all humanity has a right to roam and a responsibility to protect the land by maintaining its balance. This principle is informed by an acknowledgement of resource scarcity: As elders explain: 'You can never increase the land, only God can do that'"- Inter-American Development Bank[7]

"At night, bulldozers destroyed our rubber gardens and even our rice fields...What will happen to us? The government has ambitious plans for new large-scale plantations. Actually there should be seven villages marked in this area. But they are not mentioned. Does this mean, for the outside world we do not exist anymore?" - Icin, a *Dayak* farmer displaced from his "sleeping" land by PTPNXIII, the state-owned Indonesian palm oil company[8]

The increasing expansion of agrofuel feedstocks has pushed the agricultural frontier into wilderness and formerly degraded areas resulting in massive deforestation, water pollution, loss of biodiversity, and displacement of people, including the *Maasai* and *Dayak*. While corporations and government promoters maintain that agrofuels are sustainable alternatives to petroleum, they threaten to turn hitherto uncultivated areas of the Southern Hemisphere into green deserts. What is different about the fuels relative to other agribusiness endeavors is the new focus on "marginal" lands on which many women rely for household provisioning. Partly in response to the charge that agrofuels usurp fertile agricultural land in aid-dependent countries and divert food to fuel tanks, policy makers proposed that feedstocks be grown on degraded, idle, and wasteland, dubbed "marginal land," in the Global South. The United Kingdom's *Gallagher Review* (2008) and The Royal Society's *Sustainable Biofuels* (2008) as well as other policy white

[7] Rothkopf 2009, p.78

[8] Gaia Foundation et al 2008, p. 4

papers admitted that agrofuel production risks transforming agricultural land with associated greenhouse gas emissions and suggested that agrofuel development on marginal or degraded land was not only desirable but would entail the co-benefits of revitalizing the land while providing carbon dioxide savings (Gallagher 2008; Mathews 2007; The Royal Society 2008). The suggestion that agrofuels grown on "marginal" land can be "sustainable" is disingenuous at best and reflects a cruel disregard for the world's poor by elites in both hemispheres in the hunt to squeeze more profit out of every corner of the globe. Furthermore, targeting marginal land directly affects poor rural women.

A U.N. (Rossi & Lambrou 2008) study noted that often women do not have access to land, credit, or inheritance rights without the consent of living male relatives. Women, because of their inability to own land, obtain credit, and other factors, often keep their households together by farming, gathering fuel, grazing animals, and obtaining building materials on so –called marginal lands or "wastelands." These lands are usually common property resources where women gather items provide their households with subsistence items.

Studies of how much marginal land exists vary widely from 386 to 500 million hectares. The rhetoric among governments and multilateral organizations has focused on the term "marginal land," yet the areas targeted for feedstock development are often those with higher value lands in areas rich in biodiversity. Moreover, the terms "marginal land" and "abandoned land" have been conflated in many assessments. One study deemed "abandoned" any land previously used as cropland since 1700 and subsequently not under use when modern satellite imagery showed it as forest or on the outskirts of urban areas. Furthermore, no comprehensive evaluation has been done to determine

whether satellite imagery captures prior and ongoing smallholder subsistence activities such as fuelwood collection, grazing, and shifting cultivation (Vermeulen and Cotula 2010, p. 903; Gaia Foundation et al. 2008, p. 2). Additionally, indigenous people and smallholders are often actively managing biodiverse landscapes through selective breeding, weeding, cultivation of wild and naturalized species, and gathering activities. The monoculture that results from land concentration and fragmentation of the CPR's of smallholders and indigenous peoples has a deleterious effect on biodiversity and consequently their food security (Franco et al. 2010).

Marginalizing Land and People

The so-called "marginal lands" of the southern hemisphere, in many cases, are not incorporated into the market and so are considered variously "wastelands," "sleeping," "idle," and "degraded." Most of these lands support millions of people and are vital to their livelihoods, food sovereignty, and even the conservation of biodiversity. Much of marginal land is not privately held but is land that has been under traditional or communal proprietorship for generations. In other cases it has been reallocated under land reform without formal titles or is "state" or "public" land (White and Dasgupta 2010, p. 600; Gaia Foundation et al. 2008, p. 2). In areas of mixed arable and marginal or depleted land, women are often allocated the least cultivable areas (Gaia Foundation et al. 2008, p. 2; Howard 2003: 34; Rossi and Lambrou 2008).

Plant and animal biodiversity has diminished in much of the "developed" world due to urbanization and intensive cultivation of land for large-scale agricultural production. As a result of this historical capitalist expansion, "nature" is considered a

thing apart from humans and set aside in reserves, evaluated on the basis of ecosystem location, species attributes, and economic value (Howard 2003; Kelly 2011; McGahey 2008; Waring 2004). In the Global South, the majority of poor rural communities reside near biologically sensitive areas as the result of historical, racial and ethnic, political, or economic circumstances. Some of them are mobile herders or practice shifting swidden (slash and burn) agriculture whose experience under colonialism has consigned them to marginal or degraded landscapes. Others have lived in their regions for a very long time but are seeing encroachment on their lands by agrofuel and other activities. As a result they must rely upon a variety of animal and plant species adapted to local conditions and cultivated over centuries or contend with introduced species through practical experience and selection.

The "marginal" or heterogeneous (mixed use) lands often have been impoverished by previous colonial agricultural and/or forestry projects, and the people living on them cannot afford to purchase high-yielding plant varieties and external inputs such as fertilizers and pesticides, veterinary products, and high-quality feeds needed to sustain their communities. Women's "subsistence" activities rarely provide adequate nutrition to their families, so they often rely on marketing wild-gathered herbs and fruits, handicrafts, and farm products to supplement the family income and diet.

Poor women, because of their lower status, in many traditional rural cultures suffer the most from monocropping regimes because they have no concrete tenure over the arable land at their disposal and often are allocated degraded land on which to grow food or keep livestock. They gather or cultivate "weeds" (Turner et al. 2011, p. 198) for supplementation to their diets, fodder for their domestic animals, collect wood and

grasses for housing and fuel for cooking and heating, herb species for medicinal remedies, as well as important cultural items. Because of poverty, previous resettlement, and agricultural patterns these activities can and, in some instances, do degrade the natural environment and result in deforestation. However, local communities also preserve rich genetic reservoirs of locally-adapted species that protect their stewards from crop failure and animal deaths, ward off malnutrition, disease, and hunger and are thus integral components of food security for the communities that manage them. In addition they hold global significance as living gene banks.

Enacting the "Natural"

The gendered division of labor, in its basic form, is the allocation of tasks to particular people where the tasks' routine assignment becomes a proxy for normative identity and intrinsic ability - for what it means to be a "man" or a "woman" (Kabeer 1994). The relation's structural nature derives from the constraints it places on the people involved (Risman 2004; Martin 2004) through "sedimentation" (Kabeer 1994, p. 59), so that prior divisions of labor take on social and/or religious significance over time. Within a given local context, the consistent and rigid consignment of activities and tasks to women and men based on their "natural" abilities and routine performance enhances skill sets, reinforcing the notion that women and men are naturally better at particular jobs, and determines whose knowledge and labor is worthy of visibility and acknowledgement (Ridgeway 2009; Kabeer 1994).

While being accepted on an individual level, these beliefs are institutionalized through their widespread dissemination and enactment at the social organizational level such as within religious, governmental, and other entities. Moreover, though they appear to be universal, they directly reflect the practices and understandings of the dominant group (Ridgeway 2009). For men in many cultures to be seen nurturing children or, worse still, performing domestic labor such as carrying water or fuel for the household, cooking, doing laundry, etc. is to risk emasculation before their peers in order to maintain the gender order. Local and regional cultural conceptions of femininity and masculinity are also hegemonic, setting forth ideal norms of behavior for men and women (Ridgeway 2009; Risman 2004; Connell and Messerschmidt 2005). In addition to restricting each gender to certain responsibilities and activities, the gender order also constrains to whom women and men of different class positions can interact and in which physical spaces which they may conduct their day-to-day business. In many cases women and men have different material access to natural resources such as plants, fields, and forests (Howard and Nabanoga 2007; Howard 2003). Despite the claim by agrofuel proponents that the fuels' introduction will end deforestation and result in the "greening of formerly waste and degraded lands" (Mathews 2007, p. 3556), there has been widespread clearing of both primary and secondary forests with negative economic and physical results for women.

Deforestation

Research shows that forests, as well as possessing incalculable value in furnishing "environmental services," provide resources that play an important role in "poverty

mitigation" (Sunderlin et al. 2004, p. 1386). It is nearly impossible to sum up the importance of forests. They sequester carbon dioxide, retain moisture and minerals, and act as habitat for plants, animals, and humans. All forest types supply a range of fuels, foods, building materials, medicines, and religious, cultural, and household products to human communities. Forests are home to at least 300 million people worldwide. Additionally, 1.2 billion of the world's poorest people, 70% of whom are women, depend on forests for some part of their livelihood (FAO 2009). Because many communities use forest products for subsistence or informal trade purposes, there are no accurate measures of how much they contribute to household income, but the evidence suggests that it is at least 20% in poor households (UNEP 2009).

Often the ways in which men and women relate to forests follows a general division of labor that locates men within the formalized sector while women occupy a more informal role in extraction and management. Men tend to extract forest resources such as sawn logs and other timber products for sale in the formal market while women generally collect wood for fuel, fencing, and housing, and non-timber forest products (NTFPs) for medicines, household items, food subsistence, and informal sale and trade. Studies show that poor rural women are generally more dependent on trees than are their male counterparts (UNEP 2009).

Two and a half billion of the world's people rely on biomass (field stubble, animal dung, and wood) to heat their homes and cook their food (Clancy, Oparaocha & Roehr 2004). Women and their children, particularly girls, gather and carry that fuel. The work is backbreaking and consumes large amounts of time and metabolic energy (ENERGIA 2006). In Zambia the time a woman spends collecting and carrying wood is

800 hours per year and in Gambia and Tanzania it is about 300 hours (Rossi and Lambrou 2008). Additionally, in sub-Saharan Africa women's responsibility for caring for relatives affected by HIV/AIDS robs them of the time they would devote to subsistence and income-generating agricultural activities, forcing them to rely on forest foods and the sale of fuel wood to make ends meet (FAO 2009).

Ironically, the expansion of the agricultural frontier as the result of agrofuel feedstock monoculture and the consequent deforestation forces poor women to walk longer distances to obtain their own fuel, narrowing what precious time they have to make household decisions or engage in activities that ensure the economic and food security of their families, or they must spend precious funds to buy charcoal, impoverishing them further. In areas of East Africa there is evidence that scarcity of wood has caused many pastoralists and smallholders families to skip meals to conserve fuel (FAO 2009). In West Africa, deforestation is occurring rapidly, particularly in areas that are not considered economically important where women gather fuel in the dry season to make charcoal.

Ghana has lost 46% of its dry forest and 31% of its fallow vegetation to agrofuel plantation development (German et al.2010). Schoeneveld et al. (2010) found that fields growing so-called "minor" crops (those belonging to women) were cleared to make way for *Jatropha* cultivation. In the Brong Ahafo and Ashanti regions of Ghana the researchers found that a "significant proportion" of the land acquired by the companies was also forested. Women collected wild fruits, medicinal plants, shea nuts (*Parkia biglobosa*), *dawdawa* (*Vittelaria paradoxa*) and fuelwood from the nearby forests. Loss of the cultivated "minor" plants, those associated with women, and access to nearby

NTFPs reduced household incomes and crops important to the food security of the local people.

Deforestation impacts in the study area were "most profound" for women for two reasons: they lost sources of income, and the loss of land and forest access placed additional time burdens on their labor. Since women also make charcoal to sell in the dry season when income from farm products is less stable, they had to expend more time going to collect it; three quarters of the women from households in the study area reported that they had to spend more time walking to obtain firewood. Moreover, the authors found that indirect pressure on the remaining forests increased as women continued to gather wood on smaller patches of forestland (Schoneveld et al. 2010).

A case study by Tsikata and Yaro (2011) of the impacts of *Jatropha* in Northern Ghana found that the presence of the Norwegian-owned Solar Harvest Ltd., formerly Biofuel Africa Ltd., increased land tenure insecurity but also had a negative environmental impact on both genders. The migrant *Dagomba* people of the villages Kpachaa, Jahse, Tugu, Kpalkore, Joro, Chegu, and Tijo saw their chiefs enter into deals with the company that enabled it to establish 400 hectares of the feedstock and half that amount for maize on the best arable land. Most affected was Kpachaa whose people moved to a small area of marginal land sandwiched between the village and a forest reserve.

The authors found that class politics within the community ensured that wealthy elites took advantage of the benefits of traditional power to the detriment to the poorer farmers who alternately became tools of resistance and acceptance of the project but reaped the least of the services and were cut off from community property resources. A

quarter of the village was affected. The wealthier farmers, based in neighboring towns, simply picked up and moved to other farming areas, while the poorest and, consequently, the most reliant on the local environment, suffered. Men reported a decline in wildlife species and population lessening hunting opportunities (with the exception of mice) that previously attracted wealthy urban hunters. Fulani herders' controlled burning was also causing a shortage of roofing thatch.

Poor women's experience can be seen in 31-year-old Lareba's story. Lareba moved to Kpachaa to take advantage of good harvests where she and her husband farmed yam, rice, maize, and peanuts on 7 active acres with 3 under fallow rotation. Her husband had a good job with Solar Harvest, but was later fired when he tried to clear virgin forest to replace the four acres of farmland he lost to the project. Lareba's own farm is an acre of peanuts. To make ends meet, she also gathered shea nuts to make shea butter, and she also collected firewood and made charcoal for free from the commons to sell in the dry season. She earned enough from the sale of just the firewood alone to buy food to get her family through to the next farming season and enable her to afford expenses for her two children. She has given up both of these activities because the resources are too far away to be accessible by foot, as the company cleared the "bush land" of all vegetation, and relocated farmers deforested their share of it as well. Now her family experiences food shortages from 4 to 5 months of the year. Local gender politics articulated with agrofuel capitalism in the loss of the commons as male community members admitted to warding off government environmental officials to enable the company's deforestation of the women's economic trees in favor of commercial benefit of paid employment that would go to the men (Tsikata & Yaro 2011).

Shao reports that, according to cultural and spiritual tradition, patches of original forest are preserved and considered sacred because they are believed to contain ancestral spirits that protect the community. These *dawadawa* and shea nut trees and other important tree species also harbor and protect biodiversity as well as retain moisture in the dry seasons (Shao 2002). Community preservation of bush lands and forests for economic benefit, along with women's management activities in the forested areas, often encourages biodiversity as well as ensuring the availability of water.

Water Loss

Along with deforestation agrofuel production's displacing effect on land use has a negative impact on water resources exacerbating both scarcity and pollution as deforestation and chemical applications increase (De Fraiture, Giordano and Liao 2008; Gerbens-Leenes, Hoekstra and Van der Meer 2009). Worldwide water demand is growing due to a number of factors including population growth, urbanization, climate change, and poverty. As more land is appropriated for energy crops, water demand will rise and allocation of water resources will shift. Increases in oil prices and agrofuel feedstock expansion will result in both a rise in water prices and competition for the available water for irrigation. Eighty-six percent of the world's freshwater is dedicated to the production of food and fiber (Gerbens-Leenes et al. 2009), and access to clean water affects more than one billion people worldwide with most of the scarcity concentrated in the Global South (Roy & Crow 2004).

Without accounting for agrofuel production, 7,130 km^3 and 2,630 km^3 of the world's freshwater is lost to evapotranspiration and irrigation withdrawals respectively

each year. For comparison, Lake Huron, one of the Great Lakes in the United States has a volume of 3,500 km^3. In 2007, about 45 billion cubic meters of irrigation water was used for agrofuel feedstocks; this number amounted to about 6 times more water than was consumed globally (Bringezu et al 2009). Evapotranspiration and irrigation of agrofuel feedstock crops is estimated to pull an additional 100 km^3 and 44 km^3 respectively (DeFraiture et al. 2008). Building on previous bioenergy research, Gerbens-Leenes et al. (2009) studied the water footprints (WFs) of the 12 crops that comprise 80% of all global crop production. They also included *Jatropha* because of its relation to agrofuel energy, although oil palm was not included. Calculating the number of liters of water to produce one liter of fuel, their study found that the WF of liquid agrofuels was large in comparison to conventional sources of energy. The water-to-fuel ratios for the agrodiesel crops soy, rapeseed, and *Jatropha* were 13,676, 14,201, and 19,924 liters respectively to make one liter of fuel. While the agroethanol crops sugarcane and maize accounted for 2,516 and 2,570 liters of water to produce one liter of ethanol, leading the authors to question whether "we should use our limited water resource base for food or energy" (Gerbens-Leenes et al. 2009).

Agrofuel and commercial banana growing operations are competing with small farms for water on the southern Philippine island of Mindanao. Following the Philippine government's 2007 agrofuel off-set mandate, approximately $1 billion and $1.3 billion changed hands between the state-owned Philippine National Oil Co. and Biogreen Energy (Malaysia) and NRG Chemical Engineering Pte. (UK) respectively for the establishment of a 1 million hectare *Jatropha* plantation with refineries replacing at least 500 hectares of farmland on which the indigenous B'laan tribe cultivate food. In

Sarangani, the B'laan women grow rice, bananas, corn, and root crops to feed their families. Speaking to people assembled to address violence against women, Lorna Mora, a leader of the B'laan, told how agrofuel plantations were encroaching on indigenous land and displacing food crops. Citing government policy in favor of short-term gain, she said,

> We cannot eat three times a day like we used to [because only a few parcels of land have been left to till]....The [establishment of] jatropha plantations may appeal as an immediate solution to [the] local energy [problem], but this initiative does not [consider] the social effects (Caluza 2008).

Smallholders abandoned planting rice in favor of *Jatropha* but found that it is not as drought-tolerant as development agencies have claimed. One farmer had not reaped the benefits after three years in production because of an infestation of pests and water access problems. To meet its blending mandate the state has prioritized water allocation for large concerns such as banana and oil palm plantations, leaving rural women like Erlinda Garcia with fewer income options. Ponds that used to harbor *cogon* grass, a traditional roofing material, were drained to supply the nearby palm estates. Garcia and other women gathered the grass and freshwater snails to sell in the market for money to supplement their incomes as gleaners, weeders, and harvesters in the rice paddies. Now that the resources are no longer available to them, they must find other ways to replace the crucial income (Reyes 2007).

The deforestation necessary for agrofuel production results in the loss of creeks and small rivers during dry seasons and flooding during the rainy seasons. Rural communities usually have access only to such bodies of water, as water services are generally scarce and, when they are available, expensive. In many communities men and

women have different approaches and allocation priorities for water. In much of the Global South the division of labor within the household dictates that women and their children, usually girls, are charged with providing water for the household, garden, and animals. In many cultures, the sight of a man collecting water would bring shame upon him and his family (Ahmed 2000). Men generally engage in activities that have more market value and so allocate water to commercial use, such as their businesses, while women use water for household activities and informal economic purposes (Ahmed 2000; FAO 2009). Women and their children may walk from 2 to 8 hours a day to get water for the family's needs, often waiting their turn to fill up their containers and carry them home. The pollution and dessication of water sources associated with monocropping is forcing communities to go farther for their water as well as increasing impacts on local water sources (Holt-Gimenez & Shattuck 2009; Orth 2007).

Typically production of agrofuel feedstocks is associated with soil erosion and nutrient runoff. While tillage practices and chemical applications vary according to soil and plant type, the monocultural conditions demanded by agrofuel feedstock production makes fertilizer and herbicide input inevitable and consequent pollution of groundwater and coastal zones a strong possibility (Dominguez-Faus, Powers, Burken & Alvarez 2009; Rossi & Lambrou 2008). Some of the so-called marginal lands tend to have lower tilth, necessarily requiring application of fertilizers and water to grow energy crops. Since these lands are more prone to degradation, topsoil loss, and chemical runoff, there is a real possibility that production would increase the burden of water demand and pollution as well as petrochemical applications (Dominguez-Faus et al. 2009). Dominguez-Faus, Powers, Burken and Alvarez (2009) reported that chemicals used on

crops grown in the US for energy feedstocks contributed to hypoxia (dead zones) in the Gulf of Mexico. The nitrogen contributing to the condition was runoff from fertile agricultural land in the US "corn belt." However, the authors noted that the use of marginal land to grow agrofuel feedstocks would require greater tillage and inputs of fertilizers with a corresponding impact on water and soil quality.

Holt-Gimenez and Shattuck (2009) report that Brazilian rivers and creeks are drying up as water is diverted to eucalyptus (a "second-generation" feedstock) plantations, while a case study by Orth (2007) found that water sources near oil palm plantations in Central Kalimantan had lower quality than those located farther away (Holt-Gimenez & Shattuck 2009; Orth 2007). Orth reported that Palm Oil Mill Effluent (POME), a mixture of fats and crushed shells generated in the processing of agrodiesel, was found in rivers near her study area. POME has a high biological and chemical activity that deprives aquatic life of oxygen. Monitoring data conducted in the nearby Barito River found POME contamination had resulted in massive fish death (Orth 2007). Additionally, a water quality study in the Ketapang District of West Kalimantan by Carlson and Curran (2007) found that streams in close proximity to oil palm plantations had elevated temperatures, much greater turbidity levels, and higher biological activity. These factors affect fish species and in turn contribute to greater food insecurity (Orth 2007).

While there are no case studies available that detail the gendered water impacts of agrofuels, clearly diversion of water to feedstock irrigation, disappearance of streams and watering holes, and pollution of water sources deeply affect rural communities. Julia and White (2011) reported palm oil companies treated the water within palm plantations in

Sanggau as their property, forcing women who were fishing to throw back their catch. Further, as water collectors and managers, women often know the best sources of water and can detect pollution through taste and appearance (Ahmed 2000). Yet, while those skills serve their communities well, pollution and the outright disappearance of water sources place more of a burden on them when they are forced to go farther in search of clean water. Additionally, the loss of clean, viable water sources destroys the wild and naturalized biodiversity upon which many rural communities depend. This, in turn, leads to loss of traditional knowledge and skills.

Disappearing Biodiversity

Genetically diverse and naturalized species of plants and animals have the ability to perform under conditions that are too harsh for the common high-yielding varieties and serve as companion plants for main staple crops to ensure that there is something to eat in case of infestation, uncertain rainfall, price hikes/drops, and sociopolitical disruption. Generally it is the women of rural communities who are responsible for the resilience and security of the food supply. Patricia Howard (2003), citing numerous case studies across the globe, states that women, because of their position as food providers, generally possess the greatest knowledge of landraces and are primarily responsible for *in situ* conservation of biodiversity. Yet many (but not all) of the communities in which these women live consider their activities and expertise secondary to that of men who are deemed the true possessors of knowledge and managers of natural resources. Because the domestic sphere is where most of the highly localized and non-monetary management and conservation takes place, women remain invisible to outsiders (Howard 2003;

Momsen 2007). That invisibility, the destruction wrought by large-scale agrofuel monoculture, and the changing gender regimes due to their introduction will have a negative effect on this biodiversity and knowledge and practices that sustain it.

Studies of agrofuel monocultures show a clear loss of biodiversity (Danielsen et al. 2008; Koh & Ghazoul 2008). Moreover, naturally occurring biodiversity intergrades with the genetic diversity of food crops for all people. Genetic diversity of plant and animal species is a cornerstone of human food sovereignty. This diversity provides communities and, indeed, the world with protection against natural and economic shocks. Yet currently seventy-five percent of the world's food is dependent on just 12 plants and 5 animal species, and only 3 species of plants – wheat, rice, and maize – supply 60% of the calories humans consume (Lambrou & Laub 2006). For various reasons, including poverty, cultural tradition, land settlement patterns, or lack of access to commercially available food, rural people's dependence on natural resources often privileges them with an intimate knowledge of the conditions of their environments. In harsh climates where high-yielding livestock and plant varieties fail, they maintain locally adapted species for subsistence. Since women are often involved in the daily tasks of animal husbandry, weeding, selecting seed, gathering wild plants, cooking and preparing food, they possess knowledge and make decisions that ensure resilience of the food supply. Eyzaguirre and Dennis (2007) found that multiple uses for crops and a multiplicity of people involved in making decisions regarding crop characteristics maintains plant diversity and resilience.

Vanishing Rice Knowledge and Bees in Indonesian Simpukng

Palm oil production has already taken its toll in South East Asia, which is host to a large amount of the world's biodiversity. Malaysia is ranked 14th out of 17 of the planet's "megadiverse" countries. Much of this biodiversity resides in and is dependent on lowland evergreen and tropical forests. The IUCN lists 1500 plants and 143 animals in Malaysia as "threatened," while 22 animals and 199 plant species are considered "critically endangered" (Smolker, Tokar, Petermann & Hernandez 2009, p. 39). Indonesia has the second most biodiverse rainforest in the world, covering just 1/3 of Earth's surface and supporting 10% of its flowering plants, 12% of all its mammals, 17% of all its bird species, and 16% of its amphibians and reptiles. Among its most famous inhabitants are the Asian elephant, Bornean and Sumatran orangutans, the Sumatran tiger, and the Sumatran rhinoceros. Forest peoples have played an integral part in forest management and biodiversity maintenance (Smolker et al 2009; Mulyoutami, Rismawan & Joshi 2009). Together the two countries produce approximately 85 percent of the world's palm oil. By 2004, Malaysia had 4 million hectares of oil palms, while Indonesia had about 6.5 million hectares with plans to expand feedstock production to 26 million hectares by 2025. Indonesia intends to add another 21 million hectares of oil palm by 2025, a 43-fold increase. In 2005, Indonesia's President Susilo Bambang Yudoyono announced plans to establish 'the world's largest oil palm plantation' on the Malaysian/Indonesian border in Borneo. The Kalimantan Border Oil Palm Mega-Project would convert 3 million hectares of primary rainforest to oil palm plantations, including three national parks, and would have untold ecological and social consequences for many people, including the indigenous *Dayak* (Colchester et al. 2006; Smolker et al 2009).

In Central Kalimantan the *Dayak Tawoyan* (a sub-group of the *Dayak Leungan* people) people's religion, *kaharingen*, dominates their forest management practices and long rotations of crops and land use. Meri Orth, studying three villages in the North Barito region, found that about five kinds of forest uses support *Dayak Leungan* peoples. Some of these forests appear to be degraded because the *Dayak* use them for rubber gardens, but they are secondary forests and actually support a wide variety of biodiversity as well as providing food security (Orth 2007). Their swidden system of agriculture maintains landscapes of domesticated and semi-domesticated agroforestry environments called *simpukng*, in which 143 valuable species have been identified, and also rice cultivation fields called *umaq.* The forests are rich in biodiversity and contain most of the food, fuel, and medicine the *Dayak* use in their daily lives as well as rattan, rice, and honey that are traded and sold to generate cash for the communities. As in many subsistence cultures, men do prepare the *umaq* and the *simpukng*, while the women perform maintenance work. Mulyoutami, Rismawan, and Joshi (2009) argue that the Dayak system of agroforestry is crucial to biodiversity conservation and state that indigenous systems of knowledge must be given priority. They further state that women's knowledge, gained through their experience helping to manage the *simpukng*, is critical for biodiversity preservation (Mulyoutami et al 2009).

Among the *Benuaq* and *Bentian Dayak* peoples in East Kalimantan, the division of labor makes it such that women's work is seen only as reproductive. Women perform a wider range of the tasks related to *umaq* (paddy field) and *simpukng* (fruit orchard) cultivation and maintenance than men. Additionally, while men perform the visible work of land clearing, felling and pruning trees, burning vegetation, and harvesting, women

perform less visible tasks such as seed selection, weaving, sowing, vegetable gardening, and food processing, and so their role in agriculture is overlooked by those outside the community (Mulyoutami et al. 2009). Yet, the *Benuaq* people do have a goddess known as *Luwikng* who is honored when rice is harvested. Only women and daughters from one family do the harvesting of a particular *umaq* at this time. The farmers save and exchange seeds and practice seasonal rotation of rice varieties to ensure vigor and resilience.

The swidden system follows nine steps consisting of 14 recognized growth patterns. Men make the decisions about which seeds to plant, and women have some knowledge of seed varieties, however age and community rank play important roles in ethnobotanical knowledge transmission and skill level among *Benuaq* people. Hendra, Guhardja, Setiadi, Walujo, and Purwanto (2009) found that, of the 103 indigenous varieties of rice cultivated by the *Benuaq*, only the traditional leader (*Mantiq*), his wife, and three senior farmers knew all of them, while those farmers under 30 years of age could only identify 20 percent of the existing local cultivars. The study concluded that *Benuaq* traditional knowledge is eroding when the global need for seed diversity is high (Hendra, Guhardja, Setiadi, Walujo & Purwanto 2009).

In addition to their agricultural knowledge the *Dayak* also play a crucial role in *in situ* conservation of important species that are imperiled by the steady encroachment of oil palm plantations on their traditional lands. Danielsen et al., in a meta-analytical study that compared published faunal research with actual palm plantation plots, found that palm monoculture not only contributed to a net gain in GHG emissions but also supported fewer, more generalized species, while species with more specialized diets and

habits were non-existent. More disturbingly, they found that most bee species in the family *Apidae* (honeybees) were entirely absent in palm plantations, suggesting that forest pollination and regeneration in other areas could be imperiled with increased habitat fragmentation (Danielsen et al. 2008). *Dayak* people depend on a wide variety of forest products that require pollinators as well as on honeybees and their products both for subsistence and trade. They therefore act as beekeepers through the maintenance of special landscapes tailored toward honey production.

Simpukng tanyut usually contain honey (*tanyut*) trees that are valued and considered sacred by the *Dayak*. Generally men collect honey while women process the raw products into wax and honey products. *Apis dorsata*, the dominant honeybee in South East Asia, is associated with dipterocarp forests consisting of *jelemu* or *lomuq* (*Canarium pseudodecumanum*), banggeris (*Kompassia malaccenis*), *puti* (*Kompassia exelsa*), *kapur/ngoik* (*Dryobalanops lanceolata*), *bengkirai* (*Shorea laevis*), and *bilaas* (*Ficus albipila*). These species in the honey *simpukng* are actively managed through weeding, as much as three times a year, to ease harvesting and protect the trees from accidental fire (Hendra et al 2009; Mulder, Heri & Wickham 2009; Mulyoutami et al. 2009). Orth found the forest and agricultural products that sustain *Dayak Leungan* people could not be harvested due to reduced land availability, and the scarcity of wild food products and resources posed a grave danger to the food security of the communities in her study area (Orth 2007). Moreover, because knowledge is aligned with gender and age, the impacts of agrofuels threaten younger men and most women. Lambrou and Laub (2006) note that widowed and single women are most affected by loss/lack of access to traditional knowledge systems. Sugarcane and soybean cultivation for agrofuel is having

similar effects in Latin America. There, women's preservation of cassava and their use of herbs for contraceptive purposes is threatened by the possibility of large wildfires as the *Cerrado* dries up and land fragmentation prevents indigenous men from practicing an age-old sustainable burning regime.

The "Other" Amazon: The Cerrado

In Brazil indigenous people living in the grasslands targeted for sugarcane and soybean plantations face the loss of wild resources as well as erosion of their knowledge base in the cultivation of staple crops such as cassava and the gathering and processing of medicinal plants. In the 1990's the international outcry over deforestation prompted efforts to save the Amazon rainforest through the establishment of funds, buying schemes, and calls for international protection. Destruction of the Amazon continues apace, however the less glamorous but equally important Brazilian savanna, the *Cerrado*, has failed to capture the attention of schoolchildren and the popular media. In fact the displacement of agrofuel feedstocks (soy and sugarcane) as well as ranching onto the *Cerrado* prompted a food policy analyst from the Hudson Institute to comment that "Greenpeace should be grateful" (Avery 2006) to the Brazilian biotech companies for developing soybean varieties that would thrive in the "wasteland" of the *Cerrado* (Avery 2006; Houtard 2010).

According to Conservation International, the *Cerrado* is one of the world's richest tropical savannas. The 2 million square kilometer (the size of California and Alaska together) wooded grassland makes up 21% of Brazil's land area and contains 10,000 plant species, 800 freshwater fishes, 607 bird species, 411 species of reptiles and

amphibians, and 195 species of mammals including giant anteaters, the maned wolf, ocelot, and jaguar. Called the "father of the waters" (Mendonça 2009, p. 66) because of its importance as a watershed for the Paraguay and San Francisco rivers, the *Cerrado* is also home to many indigenous people who live in and actively manage its landscape (Klink & Machado 2005; Mendonça 2009). The *Cerrado* is home to 300,000 indigenous people residing in 200 distinct communities. One of these communities is the *Krahô* people whose dynamic culture and identity have changed over time through contact with the *Xerente, Apinayé,* and Afro-Brazilian peoples (Bubela et al. 2008). The *Krahô* manage their subsistence areas in the *Cerrado* with controlled burning and also possess important knowledge respecting medicinal herbs and other vitally important plant resources (Conservation International 2011).

The savanna is a fire-adapted environment, and indigenous people have used fire for generations to manage and restore habitat, facilitate shifting cultivation, and to open up the landscape for hunting. Called "patch-mosaic fire regime" (Mistry et al. 2005: 380) the carefully timed controlled burn strategy practiced by indigenous people has, in the past, protected the *Cerrado* from devastating fires during the dry season, because the previously burned areas served as fire breaks. This meant that deliberately set and naturally occurring fires could not become conflagrations that would destroy valuable trees and plants.

A study of *Krahô* people in the northeast state of Tocantins found that nearly 75 percent of the respondents cited fire protection as the biggest reason to use controlled burns. Another important benefit of the indigenous method of controlled burning is the enhancement and maintenance of biodiversity microhabitats for plants and animals

resulting from various fire histories within the landscape. The *Krahô* do not set large, uniform fires all at once but burn patches beginning in about April and lasting throughout the year until around September in different locations of their territory. The controlled burns leave islands of lightly or unburned vegetation that provide shelter, forage, and water for different species (Mistry et al. 2005). *Krahô* men usually carry out the burns between growing seasons to facilitate mineral deposition and also for pest control. Women, who are responsible for cultivating the staple foods in the *roça*, also set small cleansing burns called *ahhihpoc* in their garden grounds to eliminate pests and animals (scorpions and snakes) that could potentially be dangerous to children and older members of the family.

Studies of the *Krahô* have confirmed their extensive knowledge of the savanna's flora, particularly medicinal herbs and trees (Bubela et al. 2008; Rodrigues 2007; Rodrigues & Carlini 2005). Bubela et al. (2008) found that the strongly patriarchal *Krahô* have a health care structure that authorizes male shamans, called *wajacas*, to guard and use ethno-pharmacological knowledge. During the rainy season contaminated water contributes to diarrhea, influenza, and other illnesses. If one *wajaca* cannot address the illness, another is sought for consultation and treatment. If all else fails, the community turns to the Brazilian health service for help. While most adults are familiar with medicinal plants, *wajacas* are regarded as having exceptional communication with the spiritual world and so are the only ones allowed to practice medicine. Their placement in *Krahô* leadership underscores the importance of ethnobotanical knowledge in the community. The authors also noted that, contrary to the popular belief that indigenous people only pursue knowledge of species immediately useful to them, the *Krahô* are

interested in gaining a broad understanding of the growth habits, ecological requirements, and morphology of the plant and animal species in the *Cerrado* (Bubela et al. 2008).

A study of 57 plants used for "restricted" purposes (abortion, contraindicated during pregnancy, contraception, to ease childbirth, prescribed in smaller doses for elders and children and poisonous to humans and animals) found that the *Krahô* were remarkably knowledgeable regarding contraindications, drug interaction, and toxicity of the species. Not surprisingly, women were the most educated about 13 plants with abortive qualities, although some men in the community were able identify the species and explain their prescriptive use. They also take contraceptive drugs mostly as decoctions (teas) and have specific doses for particular uses with carefully timed ingestion periods depending on whether the woman wants to become permanently or temporarily infertile (Rodrigues 2007). Additionally, confirming an earlier study on the uses of plant species with possible action on the central nervous system, the author found *wajacas* followed a medical practice consistent with traditional Western pharmacology, prescribing one plant species at a time for illnesses and delaying treatment in order to observe the effects of the drugs (Rodrigues & Carlini 2006; Rodrigues 2007).

In their 2006 study of 138 plants used by the *Krahô*, Rodrigues and Carlini (2006) found that only 11 had been evaluated for their pharmacological properties and, of those, indigenous indications for use of components from the tree species' *Cochlospermum regium* (a headache remedy) and the herb *Casearia sylvestris* (an anti-inflammatory) were found to agree with scientific data (Rodrigues and Carlini 2006). A common conclusion of research on the ethnobotanical knowledge of the *Krahô* and other indigenous groups inhabiting the *Cerrado* is that there are many plant species

unrecognized by Western science and that the particular wisdom of the people living so close to them is an ongoing process of great value on a global scale (Bubela et al. 2008; Rodrigues 2007; Rodrigues & Carlini 2005).

With regard to women's importance in the maintenance of biodiversity, observations of the *Krahô* confirm the patriarchal nature of the society, with women doing most of the invisible domestic work, including household labor and childcare as well as food provisioning, such as fishing, gathering wild plants and herbs, growing staple foods, and also hunting. The *Krahô* diet is comprised of wild game, fish, beef, guandu beans, rice, cassava, sweet potatoes, pumpkins, and wild fruits from the *Cerrado's* indigenous trees: *Hancornia speciosa, Spondias mombin,* and *Scheelea phalerata* (Bubela et al. 2008; Mistry et al. 2005). Klink and Machado (2005), who call the *Cerrado* "underappreciated," note that deforestation there has exceeded that in the Amazon rainforest, and pressure on the ecosystem is resulting in a loss of wild indigenous cassava (*Manihot sp.*) varieties that are important genetic reservoirs for protein content and drought resistance. Cassava is a staple crop for more than 600 million people in tropical communities worldwide. However, because of encroaching industrial agriculture on the 41 areas in the *Cerrado* known to harbor indigenous *Manihot* species, only one locality remains intact (Klink & Machado 2005).

The Brazilian government has identified abandoned farms and ranchland as potential feedstock plantations, and MNCs, such as Bunge (which controls over 90% of Brazil's soy export market), are planning expansion into the *Cerrado*. Mendonça (2009) states that despite a loss of 2 million hectares per year, the destruction of the *Cerrado* has not been as visible as that of the rainforest. However by 2002 nearly 1 million square

kilometers had been decimated, and to date more than 55% of the savanna has already been destroyed; it is projected to completely disappear by 2030 (Klink and Machado 2005; Mendonça 2009).

The Settled Maasai

In its chapter "The Culture of Green", the Inter-American Development Bank's *Blueprint For Green Energy* calls on *Maasai* environmental wisdom and principles to unveil its vision of a bright energy future through agrofuel production (Rothkopf 2009). Governments and development agencies have advanced agrofuel cultivation as a strategy for poverty alleviation among rural people, particularly poor women. In many cases the people's way of life, usually part of the informal economy, and not historical, social, and cultural inequality, is seen as the source of their poverty, and they are encouraged to enter the market in the interest of economic development. Moreover, poor inhabitants are often blamed for environmental destruction. Such is the case with pastoral peoples in Africa.

In Africa drylands support 59% of the continent's ruminant livestock, and mobile livestock husbandry accounts for 66% of dryland use (McGahey 2008). In East Africa and the Horn, pastoralism is a major contributor to both formal and informal economies (Hesse & MacGregor 2009). Governments, following the flawed research of rangeland scientists and development policy experts, blamed pastoral peoples for degradation in the arid grasslands, confined them to fenced ranches, and sought to replace their herds with commercially valuable hybrids. This intensified environmental destruction and led to increased poverty and food insecurity, as well as conflict (McGahey 2008; Wangui 2008) and increasing traditional familial inequalities between men and women. Now African

nations are targeting lands utilized by pastoralists for agrofuel production as a poverty relief strategy (McGahey 2008). However, agrofuel development must be seen in the historical context of official discrimination and the changing roles between men and women as the result of gender-neutral sedentarization patterns.

The pastoral people inhabiting the plains of Tanzania, Kenya, Ethiopia, and Uganda maintained herds of cattle adapted over millennia to the harsh climate of the African rangeland. In the unforgiving landscape of the drylands, indigenous *Maasai* people have multiple adaptive strategies to heat and drought that includes moving their herds seasonally to take advantage of good pasturage and water resources. They also employ particular monitoring techniques for gauging rainfall and use phenological knowledge of the steppes refined over generations to time to track the movement of their cattle. Rotation of herds gives the land a chance to rest and prevents overgrazing (McGahey 2008). Moreover, communities also share wood, water, salts, flora, and rangeland on common properties, and they donate female cows as seed stock to destitute members through a practice called *ewoloto* to protect against poverty and homelessness (Kipuri & Ridgewell 2008; Kipuri & Sørensen 2008; Hannah 2007).

Gender dynamics among particular pastoral groups are poorly documented and understood, but Wangui (2008) found that *Maasai* women's roles have changed over time with the introduction of exotic cow species and sedentarization policies (Wangui 2008). The common perception is that a *Maasai* family's wealth (cattle) is the domain of men and that *Maasai* women occupy a minor, if oppressed, strata of the community. Historically, men spent much more time on livestock production than women (Wangui 2008), because it was the socially determined job of women to do all the work associated

with milking and milk processing. But women commonly kept detailed genealogical notes on desirable hereditary characteristics such as docility, milk production, and fertility. However, with commercialization of cattle and milk production, they have seen their workload increase with a corresponding loss of economic options, because men are beginning to take over the sale of milk products as they become lucrative.

Formerly, such close proximity to the cows imparted a thorough knowledge of animal lineage, temperament, milk yield, maternal fertility, disease resistance, and vigor. And women were, therefore, instrumental in advising their husbands on the selective breeding of this culturally important source of wealth (Kipuri & Ridgewell 2008). Through DNA analysis of African cattle, Hanotte, et al. (2002) found *Maasai* and other pastoral communities were responsible for the introgression (introduction of genetic diversity) of the indigenous African cow, *Bos taurus* with a cow indigenous to the Near East, *B. indicus*. The authors speculated that the *Maasai* diversified the genetic profile of their herds because the Eastern cow is resistant to smallpox; they concluded that pastoral herds are a crucial genetic resource of global importance because of their resilience (Hanotte et al. 2002).

While *Maasai* people still engage in limited and varying degrees of traditional pastoral activities, they have a primary interest in the preservation of the plant resources found on their rangelands. *Maasai* men are often familiar with the local species necessary to maintain herd nutrition as well as vigor. Accordingly, *Maasai* communities are important repositories of ethno-veterinary practices and remedies (Jacob, Farah & Ekaya 2004). Along with keeping genealogical information on the herd and keeping small livestock such as chickens and goats, women are also responsible for much of the

direct use of environmental resources, especially local flora. By the time a *Maasai* woman reaches adulthood she will have learned about the location, collection, and use of over 300 species of plants (Hannah 2007).

However, a UNFAO (Oiye, Simel, Oniang'o, & Johns, 2009) report on indigenous peoples' food security found that *Maasai* people in the Kajiado District of Kenya were experiencing a high level of food insecurity and declining ethnobotanical knowledge. Along with historical discrimination such as lack of access to traditional rangeland, one of the factors they attributed to this worrisome problem among the *Maasai* was their integration into the market economy as a short-term solution to their poverty.

Many *Maasai* people are poor and undernourished owing to degradation and loss of grazing land, most recently stemming from conservation policies (Kelly 2011; Zoomers 2010) that prohibit them from moving their herds to wildlife reserves and encourage them to engage in farming operations. The transition from pastoralism to agro-pastoralism has increased women's time burden, as they now take care of livestock all year rather than assigning the task to unmarried men (Wangui 2008). Additionally, wealthier *Maasai* women have seen the proceeds and control of milk products shift to their husbands, forcing them to seek other means of income.

In the Arusha area of Tanzania, where the Dutch agrofuel company Diligent has established holdings, another company, Jatropha Products Tanzania Ltd. (JPTL), emerged from a Tanzanian NGO (KAKUTE) to incorporate poor Maasai women in the local soap-making market and establish a strategic niche for *Jatropha* cultivation and processing (Van Eijck 2008; Wahl 2009). A report by Diligent-sponsored researchers exemplified the dual nature of agrofuel capitalism's narrative. On the one hand, the

authors cautioned against monocropping and food crop replacement while highlighting the fact that 59% of rural households in Tanzania already produced food crops to be processed elsewhere, and the low market value of those cash crops presented "favourable" (Van Eijck 2008, p. 318) conditions for *Jatropha* expansion. They further cited a statistic from the year 2000 that 94% of rural households in sub-Saharan Africa used wood and crop residues for household heating and cooking. The authors suggested that *Jatropha* oil could replace locally gathered fuel. However they found that women in the community preferred to gather fuelwood for free rather than pay for the oil to put into stoves supplied by TaTEDO (a Tanzanian NGO) (Van Eijck 2008). Despite these and other barriers, such as the uncertain nature of the *Jatropha* oil market, more than ten thousand smallholders in Tanzania joined the rush to cultivate *Jatropha* (Wahl 2009).

In the Rift Valley of Kenya, some *Maasai* farmers substituted food crops in favor of *Jatropha* and saw their incomes triple as oil prices climbed. Initially, the local agrofuel economy provided an infusion of badly needed cash to farmers and brokers who were able to sell the seeds for up to $10 per kilo, but in a matter of months the price dropped to less than $0.5 per kilo. Initially, poverty and hunger lessened considerably in the area. However, Esther Siteyia, a 28-year-old *Maasai* woman saw her fortunes plummet with the collapse of the local agrofuel market. Siteyia became a *Jatropha* broker, buying the seeds from local farmers and selling them to Kenya Eco-Energy project: "For the first ten months that I sold *Jatropha* seeds, my income tripled. I would buy seeds from farmers and sell them to the highest bidder at a handsome profit." At first, she was able to buy and sell five tons of the seed for a good price but found her storeroom packed with unsold produce when trade took a downturn with no buyers and the nearest processor over 200

kilometers from her farm (Bwakali 2008). Having created an artificial market and encouraged settled Maasai farmers to grow *Jatropha*, local NGOs, the Kenyan government, and the Dutch agrofuel company contributed to the food insecurity of the people in the area.

In the North capitalist relations have replaced the notion of ethno-ecosystem management where domestication and wildness blur. Instead, agriculture is conceived as a highly managed and specialized landscape relying on chemical fertilizers and pesticides, genetic management, vast tracts of land, and large machines (Howard 2003; Levins and Lewontin 2007; Waring 1988). Capital does not recognize the non-monetized management and conservation of diverse species in home gardens, on savannas, and on logged hillsides. What cannot be counted does not exist. Capitalism's narrative locating their non-market activities in the realm of the worthless while commodity production occupies the category of "improvement" is not simply a gendered and racialized discursive distinction but also a material one.

As seen in Ghana, the clear devaluing of multi-crop farming activities by Solar Harvest and its supporters in favor of large-scale *Jatropha* production resulted in loss of land and food security of poor farmers. Not only does agricultural diversity ensure better food security and pest resistance but it has been proven to provide women with more autonomy and better bargaining power within their households (Nanda 1997). Additionally, because many agrarian communities maintain divisions between "women's" and "men's" crops and land allocation, women run the particular risk of seeing that improved bargaining disappear because their crops are not valued and are plowed under to make way for feedstock cultivation. This is an example of Connell and

Messerschmidt's (2005) assertion that globalized hegemonic masculinity enacted in local communities forces a renegotiation of gender relations. The power of local elite men coupled with class status among the farmers led to allocation of the land for *Jatropha* monocropping. Previously, women's rights to NTFPs in the bush lands were recognized by local men but were abrogated in favor of their own interests. The result was that the community, in general, suffered as the land was cleared and deforested.

And just as in the case of deforestation, the massive amount of water required to supply agrofuel feedstocks is polluting rivers and causing some sources to dry up. As women are generally consigned the task of household water provision, the disappearance of access to clean water may force them to travel longer distances to obtain it, thereby taking up more of their working day. Men and women may see their farms and businesses literally dry up with the diversion of water to feedstock, as in the case of the farmers on Mindanao. Clearance of the land not only diverts and dries up water but also contributes to the loss of biodiversity, local species, and knowledge. At a time when genetic diversity is dropping on a worldwide scale, the importance of species and knowledge such as the fire and medicinal plant knowledge of *Krahô* men and the rice varieties and knowledge of *Benuaq* men could be wiped out by agrofuel development. Additionally, the preservation of cassava and other vegetables by *Krahô* women is also of vital importance. Lastly, past sedentarization policies coupled with an agenda by the Kenyan government to advance agrofuel cultivation as a poverty-relief strategy has resulted in some *Maasai* farmers trading food security for increased income only to find no market. Moreover, the continued emphasis on a settled lifestyle means that *Maasai* women have seen their household labor increase, forcing them to seek other means of making money.

Settlement of the *Maasai* also has resulted in loss of diversity of livestock and traditional knowledge held and maintained by women. As can be seen here local gender, ethnicity, and class articulate with agrofuel capitalism to disadvantage communities. In many cases, gender, age, and class patterns also constrain knowledge and practices that will also result in loss of biodiversity of local but global significance.

CHAPTER IV

LAND-GRABBING

If, as Marx (1990) claimed, the commodity is the cell form (p. 125) of capitalist production, then alienation is its DNA. Described also as primitive accumulation, the imperative is the same – to divorce the direct producer, whether violently or by legal enclosure, from the environment from whence she or he draws sustenance. This "dissolution" (1978, p. 267) of the worker's bond to nature, clears the way for land privatization in the interest of commodity production. Agrofuel cultivation depends on various forms of ownership arrangements, but its effect is dispossession either by gaining direct title to the land, by leasing it and clearing it, or by contracting. Land acquisition for the purpose of agrofuel feedstock cultivation is rupturing the tenuous connection between people and the land in the Global South.

What has been missing from most critical analyses of agrofuels is how women in the South can and are being affected by land acquisition for the purpose of feedstock production. As was noted earlier, this has global significance because women are often the ones who pass on important ethnobotanical knowledge and skills to the next generation. Razavi (2009), along with Waring (1988), points out that whereas neoclassical economists are guilty of distorting gender relations, most Marxists simply ignore them by viewing "reproduction" as a gender-neutral process (Razavi 2009, p. 198). Razavi and Deere and León (2001) find that both formal and informal land titling have disadvantaged women and have knock-on effects when decisions are made about the use and disposal of land. Moreover Razavi states that gender advocates in international organizations such as the World Bank selectively took up feminist analyses

of women's access to and ownership of land, most notably the work of Bina Agarwal, to advance a one-size-fits-all approach that privileges privatization of land as a solution to women's poverty (Razavi 2009, p. 198).

However, gender oppression does not simply disappear in a decentralized context or even in post-colonial socialist land redistribution because gender itself is historically embedded not only in individual practices and identity but also in social, cultural, economic, and political life (Acker 1990; Martin 2004; Risman 2004). Moreover, gender dynamics are intimately linked (not added) to patterns of historical exclusion based on class, race, and ethnicity and are formed by interlocking macro-level operations filtering down to micro-level individual and group interactions (Acker 2004; Collins 1995; Glenn 1998). Agrofuel capitalism exploits local gender regimes that constrain or enable certain behaviors and often subverts the ability of women in local communities to negotiate for traditional privileges and rights. Agrofuel advocates embrace privatization of land as an uncomplicated path to land concentration, and like other corporations, are exploiting historical patterns of exclusion, corruption, and the consequences of poverty to gain access to land. Even with secure tenure under state and/or customary rights rural men, but particularly women, are literally losing ground in the face of rising competition for land or outright theft. Women are generally dispossessed by the formalization of land titles to male heads of household or those who are seen to "improve" the land by companies and the state.

In his essay on agrarian change and peasant studies, Borras (2009), states that to offset just 14 percent of the world's current fleet requirements of petroleum, we would need to convert 25 percent of the Earth's arable land to agrofuel cultivation, and that we

will also need to double agricultural production by 2050 to feed the world's growing population as well as alleviate hunger for one billion people while still carrying out the business of commerce. How, he wonders, can this be done

> "without putting further pressure on the already fragile environment, without aggravating climate-related problems, without putting the task under the monopoly control of greedy corporate giants, and without causing massive dispossession of the rural poor?"[9]

Dauvergne and Neville's authoritative article poses questions to guide its investigation of agrofuel impacts on forests and rural populations. Two of the questions ask: "which rural groups seem most likely to benefit or lose out from resulting economic opportunities and outcomes?" and "what are the direct and indirect consequences for forests (and nearby ecosystems and land) of an emerging political economy of increased biofuel production?" In answer to the first question, the authors point to the likelihood that agrofuel production would exacerbate historical patterns of exclusion and land tenure while dispossessing communities of their claim to marginal land. To the second question, they note that rural smallholders are often caught between the conservation efforts of NGOs who perceive local users as destructive to the sensitive ecosystems they aim to preserve, and the capitalist aspirations of large corporations intent on formalizing claims to the land (Dauvergne and Neville 2010). By most accounts it is clear that greedy agrofuel giants are contributing to dispossession of the world's rural poor, particularly women, with devastating results for local communities. Agrofuel production requires economies of scale, most notably extensive land holdings. While about 14 million hectares of land support agrofuel plantings, land acquisitions for the purpose of feedstock production would require millions of hectares to meet the targets set by the Global North

[9] Borras 2009, p. 9.

(GRAIN 2007; Rothkopf 2009). In much of the developing world there has been a dramatic increase in the demand for land by foreign investors.

The Greedy Corporate Giants and Their Friends

Recognizing that the OECD countries consume most of the world's petroleum but lack the available land on which to cultivate agrofuels[10] to achieve their mandates, energy policy experts and multilateral organizations are looking to the Global South's agricultural and "marginal" lands. Promising rural development in the form of stable jobs and increased incomes, agrofuel advocates claim the countries of the South, with the help of private investors and multilateral lending agencies, will be able to "leapfrog" (Mathews 2007, p. 3559; Rothkopf 2009, p. 93) to the most advanced technologies and thus are calling for a "biopact" (Mathews 2007, p. 3550) between the OECD and the Southern Hemisphere (Mathews 2007; Rothkopf 2009).

Policy experts agree that a large proportion of the Earth's land is not suitable for agriculture because it is too arid, too cold, inaccessibly steep, not fertile enough, or a number of these qualities in combination. In fact, the Global Agro-ecological Assessment's satellite imagery found that, of all the world's land, only about 3,000 million hectares have the capability of supporting viable agricultural activity. In Asia, Europe, and North America almost all the cultivable land is already being farmed; the rest is under a forest canopy that would suffer "severe environmental consequences" (Cotula et al. 2008, p. 20) if placed under cultivation. In these regions large-scale development of agrofuels would require crop substitution or land clearing which would

[10] Just 15 billion gallons of ethanol would consume 45 million acres of US farmland (Holt-Gimenez & Kenfield 2009).

imperil already fragile ecosystems. According to the FAO, agricultural holdings in sub-Saharan Africa represent 98 percent of land under 10 hectares in size, while in Asia 88 percent of farm holdings are less than 2 hectares (Haralambous, Liversage & Romano 2009). However, these percentages are changing as wealthy investors gain access to large expanses of arable and "marginal" land.

Africa and South America own 80% of the world's "reserve" agricultural land. Figures vary on how much land is actually available but the rough estimate based on satellite imagery is 1359 million hectares (807 million in Africa and 552 million in South America) of cultivable (from "very suitable" to "moderately suitable") land. Accordingly, governments in the Global South, urged by corporate interests, OECD member countries, and development agencies, are instituting small and large-scale agrofuel projects (Cotula et al. 2008).

Governments in the Global South, encumbered by large external debts from the Structural Adjustment Programs (SAPs) of the 1980's and facing widespread rural poverty, have responded favorably to agrofuel initiatives by opening the door to investment by private companies, reworking legal and regulatory frameworks, and establishing land banks (White & Dasgupta 2010). Through their partnerships with MNC's and private investors, some countries are realizing the benefits of market access for their agrofuels. Brazil is on target to succeed in some areas of development while Mozambique is projected to see a 6 percent drop in poverty while gaining 0.6 percent in annual national growth. However, macroeconomic changes belie specific local and historically constituted race, class, and gender relations with regard to land access (Dauvergne & Neville 2010, p. 647). Colonization, waves of cash-cropping, customary

law, and post-colonial land redistribution have all produced power asymmetries that complicate the picture and present opportunities for changes in social relations.

Agrofuel feedstock production contributes to land tenure and land use disruptions in rural areas of the Global South. While development agencies and policy analysts cheerily predict that agrofuel production, particularly the advent of so-called "second" and "third" generation fuels, will drive agricultural intensification and more efficient use of land, they also note that "impacts on land access" (Cotula et al. 2008, p. 18) continue to be a problem and will worsen as the industry expands. The increase in competition for land is squeezing local rural populations. Agrofuel investors, through a number of mechanisms, have successfully acquired land in abrogation of the rights of local, customary users and also of people with formal tenure. Cotula, et al. (2008) identify several key linkages between agrofuel production and land tenure/land use conflicts. Direct linkages such as expropriation and concentration through increased value results when land formerly used for some other purpose is appropriated for agrofuel cultivation. Indirect linkages involve agrofuel expansion elsewhere that triggers a disruption of local land use. In the case of expropriation the state disallocates or withdraws land from local people and turns it over either to investment firms or large-scale agricultural producers in the country. Another direct but more complex impact is the rise in land values resulting from world market pressures vis à vis agrofuel production. In this case poor farmers cannot afford to rent or keep their land and are forced to move off the land they are renting or sell their land as they are priced out of the market (Cotula et al. 2008).

While much discussion has centered on the mechanisms by which land is appropriated, the result of agrofuel purchases has amounted to land grabbing. "Land

grabbing" is understood to mean extensive cross-border acquisition of land "carried out by transnational corporations or initiated by foreign governments" (Zoomers 2010, p. 429), and it is occurring rapidly. Land grabbing also includes large land deals by private investment firms and mega-entrepreneurs like George Soros of the US and Blairo Maggi of Brazil who buy and lease land under a variety of agreements ranging from unofficial use to common property tenure. Consequently, weak governance, competing and overlapping land tenure regimes, and poor or nonexistent institutional frameworks governing land acquisition have enabled agrofuel capital's incursion onto both arable and "marginal" lands. The new enclosures wrought by the national mandates originating in the North and being rapidly adopted in the South are already having alarming social and economic effects on rural marginalized communities.

Holt-Gimenez and Shattuck (2009) have characterized this phenomenon as a "territorial restructuring" (p. 181) of physical places and political-economic spaces. International finance institutions prepare the conditions for capital's penetration by setting loan conditions predicated on the restructuring of laws, regulatory frameworks, and governmental bodies within countries while on the ground agribusiness firms achieve a literal transformation of the landscape to ensure efficient extraction of the resource. There are grave and specific implications for the women of the smallholder communities that will be displaced by privatization of their land.

Owning the Back Forty? Women's Nonexistent Land Tenure

Rossi and Lambrou (2008) argue that, despite the lack of aggregate data, women in the Global South are particularly affected by land conversion and changes in tenure regimes. As men have left their rural communities in search of work elsewhere, the rural South has seen a 'feminization of agriculture' (Emanuelli, Jonsén & Suárez 2009, p. 37) with women generally producing 80 percent of the world's food in the hungriest, most malnourished countries. However, these farmers often have informal or no title to the land on which they farm. In their report on agrofuels, Rossi and Lambrou (2008), note that women in Cameroon supply 75 percent of the agricultural labor while owning less than 10 percent of the land. In Africa, Kenya, Tanzania, Nigeria, and other Sub-Saharan countries have similar patterns of disparity. Despite the land redistribution plans of the 1960's women in Brazil own an estimated 11 percent.

Yet while women often lack formal title to land, they have access rights through a mix of statutory and customary laws. In Sub-Saharan Africa, women generally gain access through male relatives, depending on the particular lineage arrangements of their communities. Similarly, in South Asia, women acquire access to land by inheritance through the male line. However, in very few instances do formal and customary laws recognize equality between men and women with regard to access and inheritance. In Latin America, where the dominant form of access for women is inheritance, only an estimated 4 to 25 percent benefited from the much-vaunted land reforms of the 1960's and 1970's (Rossi & Lambrou 2008). Moreover, women are often left out of the decision-making process with regard to land transfers and changes in land use (Behrman,

Meinzen-Dick & Quisumbing 2011; Nhantumbo & Salomão 2010; Rossi & Lambrou 2008; Julia & White 2011).

Non-market activities by members of marginalized groups are worthless in the eyes of investors and governments seeking to lease state land because they do not contribute to GDP or produce exchange value. For example Africa's colonial legacy and subsequent post-colonial sedentarization policies with regard to pastoral communities has resulted in loss of land, conflicts with agriculturalists, and, most insidiously, a pervasive attitude among government officials that their herding and economic activities are of little value or even environmentally destructive (Cotula et al. 2009; Kipuri & Ridgewell 2008; Zoomers 2010). Historic political persecution and systemic racism, as in the cases of the *Dayak* in Indonesia and Afro-descendents in Colombia, leave people vulnerable to violence and forcible expulsion from their land. Moreover, traditional views in Africa and elsewhere treat women's agricultural activities as being of little consequence to the preservation of food sovereignty and local economies, which, in addition to informal land access, works against their inclusion in negotiations. Because of the nature of their labor cultivating homegardens; gathering wood, water, and wild plants; selecting and maintaining seeds; weeding; engaging in pest control; and food processing, women are often left out of negotiations with government officials (Behrman, Meinzen-Dick & Quisumbing 2011). This is an example of how actors within large institutions enact their own gendered assumptions and harmonize them with local ones as gender theorists suggest (Acker 1990; Connell & Messerschmidt 2005; Jessop 2003). Clearly, this type of exploitation has an interlocking relationship with race and class, most notably the

concentration of wealth in the North coupled with disdain for local subsistence and small market economies, which are seen as inefficient.

Despite a general stagnation of foreign investment to many countries in Africa, Ethiopia, Ghana, Mozambique, Sudan, Tanzania, and Zambia have seen their fortunes improve since the 1990's. At the heart of Africa's foreign direct investment (FDI) boom is the perception that there are vast tracts of land available for food and fuel development (Mathews 2007). Northern investors, seeing the Global South as a new source of revenue in the midst of the financial crisis, have pumped over US$30 billion (Cotula et al. 2009, p. 25) into sub-Saharan Africa and eagerly sought to buy and lease land for food and fuel exportation.

Company Trickery in Ghana (Jatropha)

Bakari Nyari (2008) describes how a Norwegian company took advantage of Ghana's traditional land law and used trickery to obtain 38,000 hectares of forest and scrubland in Kusawgu near the northern town of Alipe. More than 80% of Ghana's land is held in common, and while official permission to develop land is covered under the 1993 Local Government Act 462, its disposal follows along traditional lines whereby the chief of the village has jurisdiction on behalf of the community.

BioFuel Africa, is a subsidiary of BioFuel AS, whose mission statement claimed it wanted to create "the largest biofuel plantion in the world" (Rughani 2009, p. 2). The area in which the land grab took place relies heavily on agriculture for household income. Literacy rates among adults are low, with approximately 65% of adults having no formal education. Climate change and little government support for farming activities leads

many people to migrate in search of wage labor. Contacted by BioFuel Africa, a government official hired a local business leader to promote agrofuels to the community with promises that the new *Jatropha* (an agrofuel feedstock) plantation would bring jobs and stable incomes to the region. The people of Kusawgu were thus convinced that their "unproductive" land would finally yield regular income as well as a decent price, so they authorized their illiterate chief to sign the deal by affixing his thumbprint to the document.

RAINS, a local community development and environmental justice NGO was able to invoke Ghana's Environmental Regulations L1 1652 to stop bulldozing of the land but not before over 260 hectares had been leveled. In the ensuing meetings between the company's Director of Land Acquisition and the community, the company backed away from promising when and how many jobs would materialize for people in the area. The chief sought to withdraw from the agreement but was told that the document was legally binding. In actuality, the claim made by Finn Byberg was false, as the company had by-passed the development authorization mandated by Ghana, however it was only after a protracted legal battle that the residents of Kusawgu succeeded in forcing the company to release the land (Nyari 2008; Rughani 2009).

Among many traditional communities in rural Africa, land was, and in varying degrees still is, seen to possess three dimensions. It has a spiritual dimension, meaning that it has divine qualities that must be respected. It has a physical dimension as an important site of production and sustenance, and it has a cultural dimension as an anchor of social identity. While many of Africa's statutory and tribal customary laws guarantee

women some *access* rights to land, matrilineal and patrilineal land tenure regimes vary, so *inheritance* is not guaranteed in most cases (Apusigah 2009).

A small portion of Ghana's land is in the hands of the state, while the remaining 80 – 90 percent is administered under customary law with chiefs signing leasing agreements on behalf of their communities (Schoneveld et al. 2010; Vermeulen and Cotula 2010). Through the 2003 Land Administration Programme, the government attempted to harmonize access and ownership rights. However, in (Bonye & Joseph 2007) of northern Ghana where Nyari's story unfolds found that women's claims were limited under all current laws and would be further threatened by rises in land value and greater economic insecurity.

Nyari noted that women in the community were the most vocal in opposition to the *Jatropha* project. One woman raged at BioFuel Africa's Chairman Finn Byberg for having lost her meager cash income obtained through gathering shea nuts and locust beans (*dawadawa*). The proceeds from those gathering activities enabled her to purchase household items and buy livestock to guard against hunger and economic instability:

> Look at all the sheanut (*sic*) trees you have cut down already and considering the fact that the nuts that I collect in a year give me cloth for the year and also a little capital. I can invest my petty income in the form of a ram and sometimes in a good year, I can buy a cow. Now you have destroyed the trees and you are promising me something you do not want to commit yourself to. Where then do you want me to go? What do you want me to do? (Nyari 2008, p. 6)

Existing studies of agrofuel development have confirmed women's increased risk of economic and food insecurity. A study by Schoneveld, German, and Nutakor (2010) of the Ashanti and Brong Ahafo regions of central Ghana found the most profound

effects of large-scale *Jatropha* cultivation fell on women who saw their incomes drop as fields and forests from which they gathered and cultivated were cleared. In Ghanaian society gender and kinship relations are central to land tenure, and the way in which land is managed is the key to true ownership. Much of the time women are prevented from exercising their use-rights to land regardless of ownership (matrilineal or patrilineal) because the gendered division of labor and/or customary norms prevent them from performing certain productive and ceremonial tasks such as making spiritual offerings and clearing trees. However, women have developed ways of getting around social norms, through cooperation with male and female relatives (Behrman, Meinzen-Dick & Quisumbing 2011; Gray & Kevane 1999).

In Ghana, women form what Shao (2002) calls the "cornerstone" of the village economy, performing over 70% of the labor associated with the maintenance of the household (Shao 2002). In many cases, rural women's socially determined position, along with a heavy reliance on natural resources, places in them in direct opposition to large-scale agrofuel development. Even though women are often involved in cash-crop agricultural production such as weeding, planting, and processing, their more visible role in subsistence activities such as growing cassava, home-gardening, and gathering means they are more likely to have smaller plots of land, since "use" confers ownership (Gray & Kevane 1999; Behrman, Meinzen-Dick & Quisumbing 2011). Apusigah (2009), echoing Waring, notes that the cultural dichotomization of productive (as farm-hands to their husbands) and reproductive (processing and cooking farm products) activities in Ghanaian rural communities is a falsification that leads to minimization of women's social importance and therefore undermines their entitlements and authority over land.

This “reproduction of the social relations between women and men” (Waring 1988) is clearly apparent when agrofuel companies approach traditional leaders for access to land on which to grow large-scale feedstock plantations (Apusigah 2009; Waring 1988), as was the case in Sanggau, Indonesia, where male community leaders by-passed women altogether by leaving them out of negotiations with oil palm companies.

ReGendering Tenure in Indonesia (Oil Palm)

Colchester et al. (2006) describe Indonesia’s development policy as following a trajectory from nationalization toward privatization of forested lands on the Outer Islands. In the earliest period of palm cultivation, the state-owned palm oil company, PTPN, controlled land holdings. In the early period before 1993, only lots smaller than 100 hectares were permitted to be released for palm cultivation. Usually the customary rights of indigenous communities were not honored, and schemes to resettle them were developed. Indigenous people were often relocated to villages elsewhere or inserted into mixed settlements of migrants from Java and Madura called *Transmigrasi sispan*.

Indonesia’s dictator, Suharto, ramped up a massive campaign of privatization and direct foreign investment and a change in land-use law that enabled logged forests planted with oil palms to be classified as agricultural lands. A four-year period after Suharto’s fall from power saw laws guaranteeing indigenous communities more access to natural resources and the establishment of protected forests (*hutan lindung)* that were not to be logged. International protests forced Indonesia’s Ministry of Forests to sign an agreement with the IMF to place a moratorium on any new palm development, however logging continues unabated (Colchester et al. 2006).

Peasants grow approximately 30%, or 1.8 million hectares, of Indonesia's oil palms on smallholder-nucleus estates schemes (NES). The majority of these farmers are either indigenous people whose land was taken from them or formerly landless *transmigrasi*. Under this plan the contractor is allocated 2 hectares of land on which to grow palms that supply a central mill and is given an additional half or 1 hectare plot on which to maintain housing and subsistence farming; the company holds the title to the land as surety for debt repayment. In many cases indigenous people lack any formal title, regardless of recognition by the state, and simply lose their lands to logging companies (Colchester et al. 2006). A 2007 report to the United Nations Committee on the Elimination of Racial Discrimination found that, in Indonesia, "indigenous peoples' property and other rights are disregarded, their right to consent is not respected, some are displaced..." (Smolker et al 2008, p. 38)

In the Sanggau district of Indonesia *Dayak* (non-Malay/non-Muslim indigenous) people, lacking formal titles, continued to live off land that had been logged since 1980. Exercising their traditional right of access to the land on the remaining 25% of the land not logged or planted with oil palms, they engaged in traditional swidden agriculture, planting rice and maize for two years, then shifting to rubber and fruit trees with fallow periods interspersed. In 2000 the palm oil company, PTPN XIII, which had been granted formal concession to the land by the state, decided that the "sleeping" land in its inventory should be developed for palm cultivation. In the night the company deployed bulldozers to clear the rubber gardens and rice fields, leaving *Dayak* occupying the area with nothing. As of 2008, *Dayak* in Sanggau province were still trying to cultivate what they could in the clearcuts (Gaia Foundation et al. 2008).

In Kalimantan, the majority of *Dayak* retain customary land rights (*hak ulayat*) with the understanding that a family that continues working its *ladang* (an area dedicated to rice cultivation) owns the swidden through labor. The *Dayak* reside in large community longhouses with apartments for each family; these villages are the basic unit of organization. However, the longhouse as a whole has no collective ownership over the land. Rather, the individual families do. Each family living in the community longhouse is economically independent from the other families and works its own *umaq/ladang* alongside the others. Often the families cultivating the swiddens do not have formal title to the land, and the land may actually lie outside the village's jurisdiction (Maunati 2005).

While the Indonesian Constitution has provisions for the recognition of customary land law, government officials rarely recognize indigenous claims to land and almost never pay those whose land is seized for palm monoculture. Further, those indigenous people who do "voluntarily" sign up to join the nucleus schemes are not informed that doing so results in permanent surrender of their ancestral lands. The loss of tenure worsens the situation of rural women in Indonesia. Many indigenous cultures in Indonesia provide not only for women's access to land but also for joint ownership between men and women. Customary law among the Minangkabau in West Sumatra enables women to hold land, while most *Dayak* peoples in Borneo guarantee equal ownership between men and women. Additionally, the amount of inheritance of land is decided by which child will eventually take care of parents (Julia and White 2011).

However, just as the environmental landscapes of indigenous peoples are transformed through oil palm monocropping, so are the legal and economic fortunes of

women with regard to land ownership. Julia and White (2011) found that prior to the large land deals in the town of Anbera in Sanggau District, women's ownership rights were honored. However, with the arrival of large logging/palm oil concerns, shifting of land use and battles over land continued a steady erosion of women's *adat* rights.

The companies sought out male community leaders to sign land deals, disseminate information regarding land disposal, sign up NES farmers, and resolve community disputes (Julia & White 2011). Julia and White explain that in *Dayak Hibun* custom, it is taboo for a woman to take part in the political process. While women are not formally excluded from politics, cultural gender regimes confine them to the domestic sphere. The public timidity and "natural" peacefulness of women is exemplified by *Entulai Ndou Labaa'* a mythical female figure who found the courage to entreat community leaders to end inter-tribal warfare only through the power of a supernatural stone she encountered (Julia & White 2011, p. 11). Because social proscription prevents women from entering public debates and negotiation, and because the women themselves trust their husbands to negotiate in their interests and the interests of the family, the companies spoke with only the male tribal leader to establish transfer, registration, and compensation. The companies used a formal smallholder registration process that recognizes the head of household as the owner of the land. And while registration is technically gender neutral, men are understood to be the head of household. The transfer of land to daughters as registered smallholders is allowed only in the case in which a family has extensive holdings.

Despite the fact that men hold sway over decision-making, a number of women engaged in acts of resistance against their husbands and the companies. Mrs. Ayokng told the story of Mrs. Daum:

> Mrs. Daum was the first person who didn't want to give up the land...she said, '*Kidoh nyorapi kelapa sawit, masi borah lonyu nyorapi*' (no one cooks oil palm fruit, still one cooks rice). She wanted to keep all of her rubber orchard. So, when her husband and father-in-law were still persuaded [to give up the land], she then moved...so desperately not wanting to give up the land, she ran away (Julia & White 2011, p. 12).

Mrs. Ayokng, herself, refused to be shut out of the negotiations and was supported by her husband and other men, as well as women in the community. She insisted that one of the smallholder plots allocated to her family be made in her name. When she did not get the share, she went to the village head and requested that she be registered as a widow and failing that as a widower. Her request was honored and she got the plot in her own name.

Clearly, modesty had nothing to do with Mrs. Daum's or Mrs. Ayokng's actions. Each recognized her economic stake in the negotiations and challenged both the 'representatives of the company and the male members of the community. But, this case also shows how organizations, such as the states or companies, impose hegemonic masculinity with regard to land tenure. "Gender-neutral" practices and language amount to gendered discrimination when economic assumptions that privilege the visible labor of men over the less visible work of women are used to justify who gets to inherit or own land. Local political gender regimes enabled male community members to transfer the land, ignoring the customary equality of women with regard to land tenure.

State Expropriation in Mozambique (Sugarcane)

"I don't have a farm, I don't have a garden, because the only land that I have has been destroyed. We are just suffering of hunger, because even if I go to look for another farm, they will just destroy it again." – Elisa Alimone Mongue, 42, single mother of two displaced by sugarcane in Mozambique.[11]

In 2007 the Mozambican government placed over 30,000 hectares under a 50-year lease in the district of Massingir for development of a sugarcane plantation. The "ProCana" project was a joint venture between the government and the United Kingdom-based Central African Mining and Exploration Company (CAMEC) to produce 120 million liters of ethanol a year for export to its neighbor South Africa. At the time of the deal, Mozambique's President declared, "biofuel development will not dislodge Mozambican farmers from their lands" (Odeny, Leonhard, Borras, and Rocha 2010, p. 32). However, a fact-finding mission by a NGO found that the parcel leased to the agrofuel company contained the pastoralist villages of Chinbangane, Chitar, Zulu, Mahiza, and Mocatini in contradiction to the claim made by the district economic activities director, Mauricio Hou, that the area was marginal and uninhabited except by "squatters" who only engaged in charcoal production (Odeny et al. 2010, p. 32). The pastoral people living in the Massingir district engage in charcoal production, cattle herding, and subsistence farming, much of which is uncounted in monetary terms. Another problem complicating the project was CAMEC's claim to land set aside for people displaced by a wildlife park.

Part of the land had been intended for the resettlement of civil war refugees living since at least 1994 in an old hunting ground before the formation of the new wildlife

[11] ActionAid, p. 2.

park. Having endured the war, the villagers had already undergone one settlement when the national park was opened allowing a greater range for elephants from South Africa's Kruger National Park. The boundaries of the Limpopo Transfrontier Park enclosed the villages of Mavoze, Massingir Velho, Bingo, Makavene, Chibatana, Mainga, Machaule, Machamba, and Ximange and left the people open to attack by elephants. The park enabled elephants access to the villages where they trampled villagers' children and raided their crops (Cotula et al. 2008; Franco et al. 2010). The village of Mavoze alone contained over 2,500 people. The Ministry of Tourism and the Ministry of Agriculture negotiated a new area for the villages in the same land that ProCana wanted for the feedstock plantation. ProCana was able, in the words of researchers, to "outbid" (Odeny et al. 2010, p. 32) the Ministry of Tourism in the relocation decision. The villagers had been promised running water and grazing rights as well as housing, electricity and jobs (Franco et al. 2010; Mousseau & Mittal 2011;Vermeulen & Cotula 2010**).** Researchers noted that the thousands of jobs (between 3,000 and 6,000) promised by the company for cane-cutting would mostly likely go to younger men; an elder of one of the affected communities, anticipating the company's hiring practices, said he doubted that the company would hire a man of his advanced age (Odeny et al. 2010, p. 33).

In the initial community-wide meeting with the villagers, the company and government representatives faced opposition when they asked the people to move their herds and farms to accommodate the project. The villagers told the officials there was no "free" land, since they used it for grazing and other activities but they were reassured the district would limit the scope of the project to ensure their continued activities. The consultation process was flawed in the way industry officials presented an either/or

decision to the people and limited any discussion of the project to how lands would be allocated and not whether the endeavor should go forward at all. Additionally, ProCana seemed to be ignoring original agreements made with the communities about the boundaries of the plantation, and the villagers were not given a timetable with regard to resettlement. Finally, the company and government officials approached male elites and elders for consent rather than the majority of villagers who felt misinformed by the company and thus opposed the project (Franco et al. 2010; Odeny et al. 2010). Women were not consulted in the negotiations at all (Nhantumbo & Salomão 2010).

Mozambique has one of the most progressive land allocation policies in Africa. Following its 1975 emancipation from Portugal and a crushing civil war that claimed approximately one million people, socialist Mozambique nationalized all of its land under a system called *direito de uso e aproveitamento da terra* (DUAT), reflecting peasant ownership through use and improvement. The 1990 Constitution and 1995 National Land Policy Act rejected privatization of land titles and affirmed that men and women had equal rights over land by stating that land cannot be sold, mortgaged, or subject to any other form of private transfer. The Land Act of 1997 officially recognized equivalence of customary law to DUAT and offered women more protection by subjecting customary law to the constitutional authority establishing men's and women's equality (Norfolk & Tanner 2007). However the entrenched prejudices of government officials with discretionary authority over land allocation and protection actually determines whether or not the state honors the rights of occupants. The legal framework providing for "productive" use of land held by the state is subject to considerable interpretation. Not surprisingly, productive use is generally understood to mean the

generation of commodities, and so the production of use-values inherent in the activities of smallholders and pastoralists is seen to be worthless (Odeny et al. 2010; Vermeulen & Cotula 2010).

Additionally, Mozambique's legal protections for women's right to land cannot eliminate discrimination within these marginalized rural communities and the entrenched poverty that affects female-headed households. In Mozambique, a fifth of the population lives in households headed by women. These households have access to smaller, less fertile plots of land and derive the majority of their income from unskilled female labor in the agricultural sector. In those households poverty and the percentage of income devoted to food purchases are significantly higher than that of households headed by men. As in most of the Global South, women predominate in the production of food crops such as cassava and maize, and while they perform a nearly equal percentage of labor in the production of cash crops, much of the time male members of their families control their revenue. Moreover, local farmers' associations are often the exclusive preserves of male community members who may not value the work of female farmers (Behrman, Meinzen-Dick & Quisumbing 2011; Vermeulen & Cotula 2010).

Another factor that has affected women's access to land in Mozambique, as in other countries in Africa, has been the HIV/AIDS pandemic. Many women become heads of households because they are widowed or divorced. Customary access is mediated through male members of the community, so women often lose usufruct rights when they are no longer connected to a man. There has been considerable evidence linking HIV/AIDS and the dispossession of rural women from their land. And while the Land Law enables women to opt out and register land in their own names, as of 2007, no

woman had challenged customary law (Norfolk & Tanner 2007). Since customary laws privilege male disposal of land and collective voice on the matter, women are prevented from participating fully in deciding whether or not land will be leased. Moreover, because women's share of land is generally smaller, the proceeds from such arrangements are likely to be meager compared with the return from the use of the land.

In 2008/2009 CAMEC was sold to the British firm BioEnergy Africa, which bought a 94 percent share of the company. The land granted to the company effectively took it out of the hands of local people for 50 years, extendable for much longer under DUAT, because CAMEC had made "improvements" and installed infrastructure such as a drip irrigation system. While CAMEC did not hold title to the land and did not "on paper" (Odeny et al. 2010: 33) violate the Mozambican Constitution, it would have been able to obtain a deed for the infrastructure after 50 years, amounting to *de facto* ownership.

Essentially, ProCana was a pyramid scheme whereby the DUAT lease granted to the company was used to promote investment in CAMEC. Based on the ridiculous claim that the ProCana enterprise would produce four times as much ethanol per hectare as any plantation in Mozambique, the company raised $13 million with a projected goal of raising another $15 million in loans. BioEnergy metamorphosed into "Sable Mining," the business's registered name in the British Virgin Islands, a well-known tax haven.

Having cleared the land of people and planted only 8,000 hectares of sugarcane on the proposed plantation, BioEnergy abandoned the project in 2008, leaving shattered communities behind. The company lured investors with extravagant claims, gained control of "empty" land under existing use by "invisible" people, then simply packed up

and left. The Mozambican government canceled the company's concession in December of 2009 but intended to find new leasers since the DUAT was no longer in the possession of the communities. The World Bank, lamenting the situation, commented that local people had lost access to game meat, fish, forest products and water, which had the most negative consequences for women (Mousseau & Mittal 2011).

In the case of ProCana, the informal economic activities of the resettled and migrant people were, in effect, feminized in the eyes of the state. Contending that the people were just "squatters" and, therefore, not productive enough to be worthy of consideration under the country's land tenure laws, the Ministry of Agriculture chose relocate them in favor of a "productive" endeavor. Despite the fairly equitable legislation instituted by the socialist government, women are still constrained by traditional gender orders that undervalue their activities.

In 2003 the World Bank's policy document, *Land Policies for Growth and Poverty Reduction*, praised Mozambique's land policies regarding local consultations and consent, overturning three decades of recommendations in favor of land privatization, monetization, and use as collateral to facilitate "productive" use. On the other hand, the United States has repeatedly challenged the government's laws, urging privatization. The United States Agency for International Development (USAID) suggested the 1997 Land Law be changed to ease the use of land as collateral for loans. In August 2011, the private US Millennium Challenge Corporation (MCC) threatened to end further aid to Mozambique if it refused to institute the transferability of DUATs (Mousseau & Mittal 2011). Transferability of DUATs would disempower rural poor people and particularly female-headed households. USAID's involvement in land privatization for agrofuel

production has not only been discursive. The agency has directly funded forcible expulsion of former slaves and indigenous people from their lands in Colombia.

Resisting Terrorism in Colombia (Oil Palm)

> Impunity and violence against women is a huge roadblock to peace. We denounce the militarisation of our lives in the name of the war on drugs, the war on terrorism, the war on everything that threatens capitalism and their financial world. - Patricia Guerrero, founder of Colombia's "City of Women". [12]

In July 2000 US President Bill Clinton approved the incorporation of "Plan Colombia" into Public Law 106-246, waiving human rights conditions and allocating taxpayer money to anti-narcotics activities in Colombia (PCN & AFRODES USA 2010. p. 3). Since 2002 the program has garnered approximately $75 million per year and was partially administered through USAID (Ballvé 2009, p. 28) for alternative development projects for palm oil production in Colombia. As of April 2010, the United States had spent $6.7 billion (PCN & AFRODES USA 2010, p. 3) to help the Colombian government, supported by paramilitaries, carry out intimidation, massacres, assassinations, forced disappearances, illegal appropriation of land, and forced displacement of Afro-Colombians (Mingorance 2006, p. 27). Professedly, the aid for partnerships between *campesinos* and agrofuel companies would serve the dual purpose of providing an avenue away from cash cropping coca and narco-trafficking in the United States' "war on drugs" and quell the fires of the 50-year war between the government and the leftist guerrilla army the *Revolutionary Armed Forces of Colombia* (FARC). In reality, the funds supported backdoor "re-colonisation" (Torres 2008, p. 34) of Afro-

[12] Amiri 2011.

Colombian lands and drug money laundering by paramilitaries with ties to the palm oil industry and the highest reaches of government.

For five centuries Afro-Colombians, the descendents of African slaves, have lived on the Pacific coast of the country. One hundred years before slavery appeared in the colony of Virginia, their forbears were brought to replace the *Carib* and *Chibchan* people decimated by forced labor under Spanish colonial rule. However, through uprisings and escapes, hundreds ventured to the south, Pacific, and interior of the country and established towns called *palenques*. By the time Colombia freed itself from Spain in 1810 under Simón Bolívar and Francisco de Paula Santander, three of every five soldiers in the army for independence were Afro-Colombian. Yet Colombian slaves were not emancipated until 1851 (Bacon 2007).

Despite its fraught history, Colombia has some of the most progressive laws of any Latin American country for the protection of indigenous and agrarian land. Its 1991 Constitution recognizes the territorial and cultural rights of Black communities, while Article 1 of the 1993 Law 70 states: "The object of the present Law is to recognize the right of the Black Communities that have been living on the barren lands in rural areas along the river of the Pacific Basin, in accordance with their traditional production practices, to their collective property" (McDougall 2011, p. 4). Since the passage of Law 70 Afro-Colombians have recovered 6.1 million hectares of their former territories through lawsuits and protests by activist groups including the *Proceso de Comunidades Negras* (PCN), a coalition of over 140 organizations representing Black communities (Bacon 2007). The land on which their descendents settled holds significant importance as a source of refuge, culture, and wealth. However, historic and systemic racism in

Colombia has resulted in poverty and vulnerability of Black communities to violence and land seizure.

While indigenous and Black communities hold their land in common, Colombia stands out among all the Latin American countries (including Brazil) in its protection of women's access to and ownership of land. Colombian women's land tenure includes the rights of female-headed households, mandatory joint titling and prioritization of special groups of women (Deere & León 2001; Taylor 2006). In 1994, the Colombian government acknowledged the disproportionate effects its war with the FARC had on rural women by granting priority in land titling to "unprotected" women, regardless of whether or not they are mothers (Deere & León 2001, p. 40). As in the wider case of Afro-Colombian land recovery, the progress has not come from the top down but is the result of the struggle by rural women, particularly the Colombian Association of Peasant and Indigenous Women, to carve out a space for themselves in Colombia's land law (Taylor 2006). Yet, while the laws on the books recognize Afro-Colombian and indigenous women's equality and ensure the right of rural populations to secure tenure, the Colombian government's agrofuel policies and its ties to paramilitaries achieve something quite different.

The government's national agrofuel blending mandates, coupled with its generous tax law regarding palm oil, serve the interests of capital while making plantation development an attractive proposition for money laundering and illegal property seizure. Colombia targeted the production and consumption of agrodiesel under Law 939, passed in 2004, which called for a 5 percent blend to fuel by 2008, while Resolution 1289, passed in 2005, established graduated blending up to 20 percent by 2012. With Decree

1135, the government required 60 percent of all new vehicles sold in the country to have E85 flex-fuel technology, increasing to 100 percent by 2016. There are no sales and fuel taxes for palm oil, and all income derived from oil palms used for fuel feedstock is tax-exempt (Sorda et al. 2010, p. 6982; Torres 2008).

At the same time that US dollars began flowing into Colombia, the amount of land planted in oil palms exploded. Between 2002 and 2006 the amount of land devoted to oil palms saw an increase of 11.5 percent, from an estimated 185,000 hectares to over 300,000 hectares, making the country the fourth largest producer of palm oil in the world (Bacon 2007; Cotula et al. 2008; Torres 2008). However, these figures do not cover the amount of land under illegal palm cultivation. A government investigation found that private interests had seized, through illegal means and phony land titles, a conservative estimate of some 25,000 or more hectares of land granted to Afro-Colombian communities (Cotula et al. 2008). Fidel Mingorance (2006), writing for the NGO *Human Rights Everywhere* (HREV), described the process of dispossession in five stages: 1) armed incursion into territory by paramilitaries; 2) occupation of the land; 3) theft or "purchase" using armed intimidation and displacement; 4) planting of the trees and the development of the "palm complex" - plantation and extraction plant; 5a) flow of palm oil to the state and for export; and 5b) tightening of territorial control, including social, economic and military control, land concentration, and the money-laundering of drug assets by declaring them palm oil income (p. 36).

Much of the Plan Colombia money went to anti-narcotics activities, such as aerial fumigation of coca plants cultivated by narco-traffickers. Flush with $87 million, the Colombian government initiated a massive 1997 offensive against the FARC. A joint

covert operation between the military's Seventeenth Brigade, under the leadership of School of the Americas graduate General Rito Alejo Del Río, and the so-called "sixth division," paramilitaries linked to the Medellín cocaine cartel, the anti-guerrilla effort terrorized the Afro-Colombian communities in the biodiverse river regions of Curvaradó and Jiguamiandó, killing 140 farmers and displacing 17,000 people from their homes (Ballvé 2009, p. 28; PCN & AFRODES USA 2010).

The wholesale spraying of Monsanto's herbicide Roundup Ultra over Afro-Colombian communities destroyed their crops and drove them from their land. This violation of the right to prior consent effectively dispossessed Black communities of their land, enabling paramilitaries to occupy it, and widening the area available to paramilitaries for coca production. In 2000 Chocó registered only 2 counties where coca was being grown, but by 2007 the region reported 31 counties in which the crop was being cultivated (Murillo-Urrutia 2008, p. 142). In 2010, PCN reported that in 1991, 82 percent of the Pacific region's Afro-descendent population claimed property while currently only 3.5 percent have property, and 72 percent of the people living in the region have lost access to land, crops, and jobs (PCN & AFRODES USA 2010, p. 5).

For its war with the FARC, the Colombian military initially received eighty percent of Plan Colombia funds, but the emphasis shifted in the early 2000s in favor of "peace" programs aimed at ramping up oil palm development. The alternative development initiatives put forward and funded by USAID aimed at demobilizing paramilitaries in favor monocropping of oil palm as the only viable alternative to coca. In 2005 the Colombian government negotiated an amnesty program with the paramilitary army *Autodefensas Unidas de Colombia* (AUC) to demobilize and settle paramilitary

forces. The *Ley Justicia and Paz* created opportunities for the combatants to give up arms in exchange for light sentences, avoiding extradition to the U.S. and allowing them to run oil palm plantations and refineries. Through these "strategic alliances" (Mingorance 2006, p. 64; Torres 2008, p. 34), paramilitaries turned poverty and systemic marginalization to their advantage and were able to solidify their "ownership" of the lands they stole from Afro-Colombian people. USAID dispersed $650,000 to Gradesa S.A., a company overseen by Antonio and Carlos Zúñiga, whose cocaine and paramilitary connections landed them on a Colombian terrorist watch list. In 2004, the agency gave $161,000 to Coproagrosur S.A., a firm owned in part by one of the AUC's bloodiest generals, Carlos Mario Jiménez, better known as "Macaco" (Ballvé 2009). Another firm, Urapalma S.A., whose founding investors included the Zúñigas, almost obtained USAID money as well but was found, along with a dozen other palm oil producers, to have seized thousands of hectares of land from Afro-descendents in Chocó. An investigation by the government's *Instituto Colombiano de Desarrollo Rural* (INCODER), the land reform agency, found that 93 percent of the land cultivated by the palm oil companies Urapalma S.A., Palma de Curvaradó, Palmas S.A., and Palmadó were stolen from Black communities (Torres 2008, p. 35). By the time the demobilization program went into effect, a popular phrase was already ubiquitous in Chocó: "Sell your land or we'll negotiate with your widow" (Ballvé 2009, p. 28; McDougall 2011, p. 10; Mingorance 2006, p. 40).

The paramilitaries delivered on the threat, displacing over 4 million people and handing Colombia the distinction of containing the world's second largest population of internally displaced people (IDPs) after Sudan (Amiri 2011; Ballvé 2009; McDougall

2011). According to a 2011 special report to the UN Human Rights Council, one third of all IDPs were Afro-descendents, and of those a majority are women who are heads of household with children. The report identified being Afro-Colombian, female and displaced a fatal combination resulting in a more vulnerable position than that of Afro-Colombian men of similar circumstances. The Colombian government stated that common experiences for Black women were rape, forced labor, and persecution and murder for membership in women's organizations (McDougall 2011).

In response to the high proportion of internally displaced women, the *Liga de Mujeres Desplazadas* (League of Displaced Women) founded *La Ciudad de Las Mujeres* (The City of Women) in 2003, whose majority leadership is Afro-descendent. Led by Patricia Guerrero, a displaced human rights lawyer, members leveled the ground and began building housing for themselves outside the tourist town of Cartagena. Following an investigation of Colombia's Housing Law with regard to the rights of displaced persons and consciousness-raising to inculcate in members a belief in the human right to decent shelter, the group petitioned the government for housing subsidies. For the first time in the country's history 100 women received social housing allocations. They raised an additional $500,000 from governments, the UN, and the Global Fund for Women among others; to raise more cash they rented nearby fields and grew corn to sell (Guerrero 2010). Taking shifts cooking, doing childcare, and crafting hundreds of thousands of handmade cement bricks, the women built a town with streets, flowers, trees, gardens and 100 houses (Rey 2006). During the construction process the women were terrorized by the paramilitaries *Ejército Revolucionario Popular Antiterrorista Colombiano* (ERPAC) and *Águilas Negras* (Black Eagles), both of which were part of the

AUC. In addition to death threats, the bodies of disappeared people were dumped in the fields bordering the new town and the husband of one of the women was gruesomely murdered while guarding the building materials.

Despite the ongoing terrorism, including the 2011 murder of Keila Esther Berrío Almanza, a second-generation resident and *Liga* activist, the five-block community is home to 500 women, men, and children. After initial completion of the homes, the women added an aqueduct, a childcare center, a small farm growing corn and beans, a community center, a brick factory, a community restaurant, and numerous small businesses supported by the community credit fund which also gives grants for educational pursuits (Bouvier 2011). Additionally, two hundred of the women did not receive state subsidies but did get job training to provide them with skills in construction, agriculture, and human development.

Having witnessed and survived the murders of family members and sexual assault at the hands of the country's armed factions, community members face ongoing threats of military abduction and assassinations from without and domestic violence within. One of the programs developed by the *Liga* is a youth group whose primary aim is to change concepts of masculinity for husbands and boys and instill knowledge and confidence in citizenship rights for women and girls. The specific mission of these consciousness-raising sessions is to advance early intervention for families and children, reduce violence in homes, and encourage youth not to serve as combatants or prostitutes in the country's armed factions (Rey 2006). In addition to work on local/cultural gender norms with legal protections for displaced people, the *Liga* and Guerrero continue to advocate on the state level for the rights of IDPs, including land repatriation. Failing redress from the

Colombian government, they also filed 144 cases, 15 of which are against sexual violence, before the Inter-American Commission of Human Rights, which issued orders from 2009 through 2011 for the protection of *Liga* members (Bouvier 2011).

Dauvergne and Neville (2010) found ownership of land shifting from public/communal to private tenure with MNCs gaining more power over time as local industries forego state oversight in favor of technology transfer and capital from their multinational partners. Some critics (Salleh 2010) tend to support pre-colonial customary tenure regimes, arising as they do from local conditions, as more fair and equitable to women. However, placing faith solely in traditional land tenure practices is romantic, and overlooks the material consequences of inequitable gendered relations for local women and status groups. Additionally, the dichotomous nature of many local gender relations privilege heteronormative expectations and responsibilities, leaving women who are not attached to a man or men without the option of exercising the informal channels through which other women (and "other" men) gain access to land (Razavi 2009). In

This can be seen in the case of Mozambique where HIV/AIDS has significantly weakened women's ability to contest decisions regarding land. While different customary and post-colonial laws may privilege women with access and indeed rights to land, conceptions of local masculinities and femininities that position women as passive, emotional, and weak while holding men up as active, rational decision-makers, with according community representation, ensure women's particular dispossession and poverty but also greatly degrade community stability as well. Additionally, the Mozambique case shows how not all men or women have an equal footing in the community, as certain particular men were approached with regard to the ProCana

decision. This was also the case with BioFuel Africa in Ghana where women lack any formal recognition of land rights under customary law and the community vests male chiefs with the authority to dispose of land for the good of all.

Yet, even in the post-colonial socialist state of Mozambique, where women have the best formal recognition in Africa of their rights to land, government functionaries chose to "feminize" the non-market activities of both men and women to strip them of their land. And when the last hurdle was to be cleared by the company – that of consulting the community – women were not among those who consulted with ProCana. Similarly, in Colombia, where women have won formal right to land inheritance and disposal regardless of their connection to male relatives, the masculinist and classist imperatives of the state's military and elite landowners contradict its relatively progressive legal stance with regard to indigenous and Afro-Colombian women and men.

In Indonesia, *Dayak adat* law recognizes a woman's equal right to land inheritance while simultaneously formally excluding women from participating in community politics, while the agrofuel companies were able to leverage local hegemonic masculinities and femininities only up to a point. This political exclusion resulted in recognition of only male heads of households as owners of the land by the government. However, women in the community resisted the structural discrimination of land tenure and at least one of the women was able to get her wish to be registered.

CHAPTER V

THE "WEAK WINNERS" CONFRONT CAPITAL

Writing in the *Grundrisse*, Marx exposed the two faces of capitalism; on the one capital is enabled (through money) to buy the "objective conditions of labor" (the land) and via this process it gains access to the living labor of free workers. Thus "unbound from their land" these "free" workers pursue capital in order to negotiate the sale of their labor. Governments, he explained, assist capital in the "stockpiling of workers" through legal and economic frameworks (Marx 1990, p. 271). Many theorists have critiqued agrofuel development from this important perspective, explaining how this achievement of a metabolic rift subjugates all realms of social and natural activity to capitalist valuation and contributes to growing inequality between the North and South (McMichael 2009; McMichael 2010; Otero & Jones 2010). Following from the new land arrangements, whether they result in complete dispossession or further peasant differentiation in the form of smallholder-owned enterprises that sell their feedstock to processors, agrofuel companies engage in practices that drive poverty (Biondi, Monteiro & Glass 2008; Mendonça 2009; Nyari 2008; Schott 2009; White & Dasgupta 2010).

Yet few examinations of agrofuel expansion from a gender perspective call capital to account for the further disempowerment of politically and economically marginalized groups and in particular the women of those communities. The introduction of wage labor and its disruptions play out differently for men and women based on the gender norms in their respective communities (Razavi 2009). Agrofuel capitalism favors the privatization of land tenure, and access laws are harmonized with a dominant

masculinist view that distorts the nuances of women's and men's local claims to land and their own labor (Julia & White 2011; Sirait 2009).

Acker (1988) notes that, with the advent of industrialization and the imposition of wage labor, wages become the method by which the means of survival are distributed. Under pressure from social unrest and the agitation of trade unions and worker uprisings, capital seeks to mediate its internal contradiction between production and reproduction by guaranteeing a family wage. However, because of the domestic division of labor and women's invisibility both within local social relations and also in the eyes of capital, women are often dependent on male wage-earners and whatever state benefits are available. When they do enter the labor force, the division of labor holds with women generally concentrated in lower paid work.

Acker's later work (2004) on the gendered influence of globalization recognizes the ways in which women in the Global South experience interaction with the market differently than women in the North as peasant subsistence is disrupted or completely uprooted. In this case, women's paid and unpaid labor is sometimes the only source of family/community welfare. Benería (2003) and others (Kabeer 1994; Razavi 2009) also point to the gendered nature of resource distribution within the rural families/kinship networks as well.

Benería cautions against applying strict structuralist understandings that privilege a narrative of "women as victims approach," (p. 78) because they are simplistic and exclude the empirical data showing women's improved bargaining power within households when they are able to command their own income, leading Kabeer to dub them "weak winners" (quoted in Benería 2003, p. 78). The feminization of labor with

regard to agrofuel companies cannot be seen as an overall improvement in the lot of local communities, because generally wage-earning in this case is driven by distress. That is not to say that women should not or do not benefit from employment in the agrofuel sector. However, the break up of farms, coupled with gender norms that constrain women to unpaid domestic labor and render them dependent on relationships with men, serve to extend their exploitation when they enter the workforce.

Poverty

Three quarters of the world's poorest people live in rural areas, particularly in South Asia and sub-Saharan Africa, which have the highest incidence of hunger. Agriculture plays a prominent role with over 80 percent of rural households relying on farming and farm products for income and financial stability. According to the *Rural Poverty Report 2011* published by the International Fund for Agricultural Development (IFAD), 3.1 billion or 55% of the "developing" world's people live outside urban centers. More than one billion people live on less than US$1.25 per day, and women constitute 70% of those people (IFAD 2010).

Governments in the Global South, encouraged by international development agencies and investors located in the OECD countries, are looking to incorporate rural people more deeply into the global economy. Since the 1980's the standard policy prescribed by multilateral organizations was faith in the market and the institution of austerity measures aimed at bolstering GDPs, enabling poor nations to pay their international debts. Applying the capitalist notion that participation in the market is key to poverty reduction, and land privatization and intensive agricultural production are

pathways to national debt relief and individual self-actualization, governments and multilateral organizations are employing the rhetoric of development to push for small and large-scale agrofuel feedstock schemes. In many cases agrofuel development has resulted in high land prices, conflicts over land, trickery, and outright theft of the land for feedstock monoculture, continuing a trend of poverty and displacement.

Proletarianization

The "development" schemes for agrofuel feedstock cultivation are leading to increased dispossession of rural smallholders. While dispossession, like capitalism itself, appears universal, it involves embodied individuals who, by nature of their gendered roles, confront capital very differently. However, contrary to the claims of international banks and policy experts, the true impacts of agrofuel expansion are responsible for a process that Farshad Araghi (2000) has called "depeasantization" whereby smallholders are not simply dispossessed by an agricultural differentiation but by complete displacement - that is by being bought out or thrown off their land – as a result of commodification of agricultural products. Accordingly, rural communities have seen a rise in land prices with accompanying concentration of holdings by companies, and in some cases people have even been thrown off their land.

In Brazil, increasing amounts of land are coming under the control of large corporations as a result of agrofuel production driving up land prices and forcing subsistence farmers to sell their farms. In 2007, Brazil's landless workers' movement, the *Movimento dos Trabalhdores Rurais Sem Terra* (MST), which claims a membership of 1.5 million landless workers, reported that 47% of cropland is owned by just 1.6% of

Brazil's population. In an interview with the InterPress Service News Agency (Frayssinet 2007), one of the leaders of the MST, Joao Pedro Stedile, mentioned that U.S. agribusiness company Cargill had recently purchased 356,000 hectares (roughly 880,000 acres) and 13 ethanol plants, while billionaire George Soros' company Adeco had invested $900 million in the construction of ethanol plants and $1 billion in land. This rush has caused land prices to rise as much as 84 percent.

Cotula et al. (2008) report that in the Brazilian *Cerrado* 70% of the land under sugarcane cultivation is owned by 340 industrial mills, holding an average of 30,000 hectares, while the remaining 30% is occupied by smallholders averaging 27.5 hectares most of which is leased to the companies. Several human rights groups had documented forcible expulsions from the land (Cotula et al. 2008; Klink & Machado 2005).

Special Rapporteur to the UN Victoria Tauli-Corpuz reported that 60 million indigenous people will be displaced by palm plantations; approximately 5 million of those people are indigenous *Dayak* people living in Indonesia and Malaysia. By the end of 2000 there had been 350 tenure-related conflicts in Indonesia. Save Our Borneo, a NGO concerned with forest peoples in Borneo claims that the customary rights of 2000 *Dayak* communities are at stake with the ramp-up of palm oil production (Ernsting 2007, p. 29). Many poor indigenous and rural people live in areas degraded by former agricultural activities and abandoned when markets shifted in favor of other industries. These "marginal" lands are now the target of agrofuel development. The irony of capitalist development is that poor migrants from other regions visit destruction and misery on poor indigenous people in the accumulation process. This is the case of Middle and Ulu Baram Malaysia where non-local Chinese Malaysian, Indonesian, and

Dayak Iban laborers logging companies associated with the palm oil have taken advantage of poverty and the lower political power of indigenous *Dayak* communities where human rights groups have documented the sexual assault of Penan women.

Rape and "Marriage"

Migration of male relatives and the encroachment of agrofuel fields on their lands by other men often leaves many women and girls vulnerable to sexual violence. In Middle and Ulu Baram, Malaysia, the rapes of 7 young Penan women ranging in age from 14 to 30 years of age highlights the impacts of agrofuel disruption. In Indonesia and Malaysia, land is first logged for timber then planted with oil palms. Malaysia is committed to bringing its indigenous population into the 'mainstream of development' epitomized by the Ninth Malaysian Plan which espouses *Konsep Baru* (literally "New Concept"), the collectivization of all indigenous land into large concessions with one title rather than many customary ones. This opens the way for oil palm cultivation by large corporations that set up temporary logging camps using migrant labor. A fact-finding mission investigating the numerous instances of rapes, abductions and forced 'marriages' of Penan women and girls, found that, in all instances, men from outside the communities were the perpetrators.

In the case of 14-year-old "J," a logger approached her proposing marriage to her while her family was out hunting. When she refused he returned some nights later, entered her family's house and raped her, then asked J's father to agree to marry them. J's father had initially refused to marry them, but because J was afraid the logger would

harm her family, she convinced him to let her go. He took her to the logging camp where he raped and beat her repeatedly, eventually abandoning her when she became pregnant.

Another woman, "N," was abducted from her village by a logger and abandoned during her second pregnancy. She eventually married an Indonesian logger who beat her in front of her children; N's father attempted to rescue her from the camp but the logger prevented him from doing so. In N's case, her father stated to the researchers that he was afraid the logging company would harm his family, and the police would not do anything to help him; he further stated that he had no means to get to a police station since the village is so remote.

"E" was offered food by two loggers while she walked alone on a road toward her village; after she ate the food, they told her she was obliged to go with them. They forced her onto a motorcycle and took her to the logging camp where they raped her. Men from her village came to rescue her and found her and the perpetrators whom they took and locked up in the village. However, the logging company, instead of disciplining or otherwise sanctioning its employees, sent a squad of loggers to free them. The villagers reported that they were afraid of the company and mentioned repeated incursions into the village by loggers looking to "marry" young women, so they released the perpetrators.

Five companies whose logging and oil palm activities are closely tied to the Malaysian government operate in the area. The temporary camps set up to serve the loggers are a source of violence and intimidation to the local Penan villages. The report identified that factors contributing to the violence were encroachment on Penan lands, poverty from the loss of resources, dehumanization of indigenous women who are seen as

sexual objects, the use of intimidation against Penan families and villages, and the lack of concern for indigenous people by state authorities (The Penan Support Group et al. 2010).

"Widows of Living Husbands"[13]

Agrofuel expansion not only causes vulnerability of local populations, but also forces people to migrate in search of income as they are pushed or bought out of their lands. In general, the poorest men and women migrate to find work. The Brazilian sugarcane industry estimates that there are 330,000 cutters throughout the country; the majority of migrants are young men who are illiterate or have incomplete educations (Biondo, Monteiro and Glass 2009). Because of their poverty rural women are left behind to tend family farms while their male relatives, migrate picking up agricultural work. In Brazil, such women are known as "widows of living husbands," because they are left alone during the growing season and sometimes for years as their husbands work as migrant labor. A 2009 report on agrofuels by the NGO Repórter Brasil (Biondo et al. 2009) tells the story of Francisca Leila dos Santos who, during her three years of marriage to her husband Jeanciel, has only seen him 9 months on an intermittent basis since he migrated from their home in São José Dos Brasilios to work in the sugarcane fields. In November 2008 Jeanciel told Leila that he would not be returning home at all until late 2009 in order to make enough money to secure a land plot on which to raise their daughter (Biondi, et al. 2009).

Dislocation and migration of poor people seeking work has different effects on men and women. In Brazil's Mato Grosso do Sul, migrant male laborers from the north

[13] Biondi, Monteiro & Glass 2009, p. 17.

of the country endure harsh treatment by the plantations, including overcrowding, lack of privacy, poor food, and beatings by security guards charged with maintaining order in the work camps. Under such dehumanizing conditions, it is no surprise that agrofuel regions are seeing an increase in violence and prostitution. Numerous NGO reports from areas targeted for agrofuel production document a breakdown of mores and customs preventing irresponsible sexual behavior and violence against women (Colchester et al. 2006; Maunati 2005; Siriat 2009; Suárez et al. 2008). *Guarani* leaders told researchers that men returning from the sugarcane fields brought violence and addiction with them (Assis et al. 2007).

Racism in Brazil contributes to a high degree of exploitation of indigenous men in the fields. In Mato Grosso do Sul, *Guarani Kaiowá* cane cutters are ordinarily given coupons by the company with which to buy food for their families at home, however the coupons can only be redeemed in shops chosen by middlemen. The inflated prices of the food coupons causes the majority of cutters to incur debts, and indigenous workers reported that they were being remunerated with housing, food, and alcohol. From February until around November, the only inhabitants in the *Guarani* settlements are women and young children (Suárez et al. 2008, p. 46). The men's absence from home prevents subsistence food cultivation and severely disrupts family life. "Sugar cane work takes us away from our culture, and then comes the alcohol, the drugs, those things which complicate family life..." a *Guarani Kaiowá* leader told a researcher (Assis et al. 2007, p. 10).

Survival International's 2010 report to the UN Committee on the Elimination of Racial Discrimination explained the impacts migration of *Guarani Kaiowá* boys and men

from Mato Grosso do Sul to work in the sugarcane and soy fields (feedstocks for ethanol and agrodiesel respectively) has had on their communities. Waves of destruction of the forests and savanna, first by ranching and now by sugarcane, have reduced their territories to a patchwork of farms, ranches and plantations forcing them to migrate for work, leaving their extended family groups in small, barren reserves. Thirteen of the twenty ethanol factories in Mato Grosso do Sul are on *Guarani* land. The migrant *Guarani* men and boys, having been separated from their families, they return to overcrowded communities with a sense of hopelessness. Drug abuse, suicide, and physical and sexual violence against women and children along with a rise in sexually transmitted diseases and a murder rate of 210 people per 100,000 is the result (Survival International 2010, p. 10). Acker (2004) notes that prostitution is part of the globalization process as poverty and inequality increase. This is certainly the case where agrofuels are concerned.

Prostitution

The roles assigned to women in their respective communities often limit their mobility and leave them vulnerable to poverty and sexual exploitation following the loss of land tenure and/or migration or unemployment among men in the community (Acker 2004). Additionally, job discrimination sometimes leads women to engage in sex work as the only means of feeding themselves and their dependents. Assis, Zucarelli, and Ortiz (2007) found prostitution to be among the impacts on urban infrastructure in Brazilian towns close to sugarcane plantations. One woman in Mato Grosso do Sul told the researchers: “I always come here at the end of the month when the guys (cane-cutters) get

paid. Back where I come from there weren't any alternatives, so the only option was prostitution" (Assis et al. 2007, p. 12).

Similarly, other studies report that poor *Dayak* women and girls in Indonesia can often be found serving customers in the "karaoke bars" near palm oil plantation dormitories or along the highways leading into the plantations. In fact the word "karaoke" has become stigmatized in Kalimantan because of its association with illicit sexual activity. Historic state repression against *Dayak* men has contributed to loss of land, causing the poorest to seek casual agricultural labor away from their families. In Sanggau district, PTPN XIII is one of the oldest corporations operating in West Kalimantan and one of Indonesia's first NES plantations; it has benefited from the Indonesian government's strong central planning and disregard for the rights of indigenous people. During Suharto's rule, when challenged by local *Dayak* people over land access and ownership, the company accused indigenous leaders of belonging to the banned Indonesian Communist Party (PKI). To be accused of PKI membership is particularly feared as Suharto banned the group and exterminated a reported half million members in 1966. To the present day former members face job discrimination and are prohibited by law from serving in government positions. The plantations, established in 1979, were part of the *transmigrisi* scheme and thus migrant workers were allocated up to 90% of the NES land while local people occupied the rest upon transfer of their land to the company. By 2006 the company had acquired in excess of 61,000 hectares for its operations and had devoted 720 hectares to housing and subsistence agriculture; the government had not issued permits to the 221 smallholders participating in the NES program (Colchester et al. 2006). The desperate situation among *Dayak* people has

resulted in changing local concepts of the gendered nature of work and concepts of femininity and masculinity (Julia & White 2011; Sirait 2009). Sirait (2009) reports that among the *Dayak*, a new concept of masculinity, marked by a lack of respect for women, has taken hold as the result of the disruption brought on my logging and oil palm expansion. Additionally, Sirait notes that poor *Dayak* girls, who used to work for wealthy *Dayak* families as housemaids, while continuing their studies, are now avoiding such work in favor of "easier" jobs as prostitutes in the karaoke bars.

The region has seen a rise in sexually transmitted diseases and unwanted pregnancies as women, lacking basic health care and the power to negotiate safer sexual practices, sell their bodies for palm oil money (Colchester et al. 2006; Friends of the Earth et al. 2008; Maunati 2005; Sirait 2009). A farmer in Sekadau, West Kalimantan explained to a researcher how the oil palm companies were directly involved in the sex trade:

> Once the palm oil is harvested, the company pays the different small holders their share of the yield. On payday, the company sets up a so-called night market with stalls offering karaoke, drinks and also gambling. The company pays local women to work as waitresses at the stalls. With the karaoke and people getting drunk, it is the women who get harmed. For instance, we recently saw a case in Sambas district where eight women have become pregnant as a result of such night markets (Friends of the Earth, LifeMosaic & Sawit Watch 2008, p. 93).

In the Global South a growing number of agricultural workers are employed in casual, informal labor; approximately 20-30 percent are women. Women make up forty percent of the casual agricultural labor in Latin America and the Caribbean, while the figure is estimated to be much higher in African countries (Rossi & Lambrou 2008: 14). As women enter into outside employment they are subject to disadvantages rooted in the traditional division of labor. Ostensibly, plantations and smallholder out-growing

schemes are gender-neutral, relying on only the worker's productive capacity. However, in reality they are sites overlaid with gendered assumptions. Rossi and Lambrou (2008) report that landowners prefer female workers, because they are considered more "docile" and can generally be paid less than male field workers. Women (and children) are often employed in what are considered easier, less physically demanding jobs. As migrant laborers women's health and that of their children becomes even more precarious (Rossi & Lambrou 2008). Acker (1990) advances the notion that under industrial capitalism, jobs are separate from human beings in that they are reifications, "scraps of paper until people fill them" (p. 151). The person who occupies the job is supposed to be a disembodied, rational actor. Under this construction, the worker is someone with no obligations whose needs are met outside the workplace: "The abstract, bodiless worker, who occupies the abstract, gender-neutral job has no sexuality, no emotions, and does not procreate." In essence, the ideal worker is male. Paramount to job organization is the workers' acceptance of hierarchy. Yet, while the worker is assumed to be male, that gender category is historically constructed and influenced by race and class interactions that encompass global, regional, and local contexts (Connell and Messerschmidt 2005). Agrofuel production areas commonly exacerbate poverty but also capture women's services as a supplement to accumulation both as unpaid helpers to men or as low-paid workers.

The Cane Fields

Working conditions on the cane and palm plantations are hard on all workers, whether they are smallholders cultivating their own plots, landless farmers, or migrant laborers working in the corporate fields. In some cases agrofuel plantations have simply

used slave labor. A US Congressional Research Service report on human trafficking found that between 1995 and 2008 the Brazilian government rescued over 30,000 people (mostly men) from slavery. In 2008, about half of the 5,244 workers that the Brazilian government freed from slavery were working on sugar cane plantations dedicated to producing ethanol. Despite its efforts, Brazil's rural industrial plantations (including soy and sugar cane) held 25,000 men in slavery (Seelke 2010). Additionally, sixty-two percent of the 1.4 million children between the ages of 5 and 14 years old employed in Brazil are working in agricultural jobs (Suárez, Bickel, Garbers, Goldfarb & Schneider 2008, p. 18).

For those workers who earn a wage, the piece-rate system determines the amount of compensation by weight rather than by the number of hours worked. Brazilian *cañeros* in the state of São Paulo begin their day at 4am when they wake, prepare their lunches, catch the company bus, and start cutting by 6am, have a one hour lunch and end their day at 4.30pm in the afternoon. They harvest between 10 and 15 tons of sugarcane, swinging their machetes 30 strokes per minute for eight hours a day, roughly 8 months out of the year. The minimum wage for a ton of cut and piled cane is approximately US$ 1.26; a month's work amounts to about US$ 200 (Mendoça 2009). In 2007, a genetically modified cane was developed that is lighter. The lighter cane increases the physical workload of the cutter and makes it harder to obtain enough for a decent wage (Suárez et al. 2008). To achieve the day's quota, field laborers must work long hours in excessive heat, skipping breaks for water and meals, and often pressing their wives and children into service in order earn as much money as possible. The uncompensated work the

women perform leaves little time to accomplish the additional daily chores that sustain their families (Rossi & Lambrou 2008; Schott 2009, p.14).

When women do earn wages, they are subject to discrimination, paid less and can also become physically debilitated and unable to even perform the *unpaid* domestic work for which they are responsible. In order to maintain the highest level of productivity and minimize health care expenses, plantations hire only the healthiest workers. Most cutters suffer back and joint problems. Companies generally refuse to hire women for cane cutting, as their productivity is generally less than that of men. The number of women working as paid cane-cutters is about 10 - 20% of the total workforce. A *cañero's* working life is estimated to be between 15 and 20 years due to occupational diseases from repetitive motion. The FoodFirst Information and Action Network (Suárez et al. 2008) interviewed a 35 year-old mother of two who entered the cane fields at 14 and was fired after 21 years when her yields began to drop. Suffering from arthritis and tendonitis, she could no longer wash dishes, carry groceries, or do other housework because she could not close her hands or raise her arms. The mill doctor declared her debilitating condition to be a work accident qualifying her for sick pay but not for retirement benefits for a disability (Suárez et al. 2008). FIAN also found that rural female wage-earners had to perform double the hours to earn less than men doing the same labor and that black and indigenous women were more disadvantaged than their white colleagues. Additionally, Andradina Rural Workers Union (SerAndradina) claims that some companies are demanding that women show proof of infertility as a condition of hire in order to avoid any costs resulting from 'unwanted' pregnancies (Ortiz et al. 2008, p.16).

Workers in Brazil have some representation by powerful agricultural unions and have won some concessions from companies. However, in many countries unions dealing with the specific problems and working conditions of plantation workers are scarce, so the work is usually covered by an umbrella organization with little experience or interest in the concerns of plantation laborers. Because the plantations are in remote areas worker education regarding their legal rights is nearly impossible. In Southeast Asia, women have special concerns while working on palm plantations. One female worker told a researcher that the working conditions on the plantations were "among the worst in the region, even compared to those in textile factories that receive much more international attention" (Schott 2009, p. 15). In Malaysia 50% or 30,000 of the temporary workers in the palm fields are women where they are generally chosen to perform the "easier" tasks of weeding, and fertilizer and pesticide application (Carrere 2010; Rossi & Lambrou 2008; Smolker et al. 2009).

Paraquat

Agrofuel feedstock plantations reportedly use some 25 chemicals to keep down weeds, repel pests, and replace lost minerals in the soil. One of the chemicals used in both soy and palm plantations is paraquat dichloride (1,1' –dimethyl-4,4'- bipyridylium dichloride), because it is cheap and labor-saving as a weed killer. Use of paraquat is prohibited or restricted in most "developed" countries because of its toxicity and persistence in the soil. Malaysia banned it in 2002 due to concern for plantation workers but lifted the ban four years later under pressure from the palm oil industry, while Indonesia allows its use (Smolker et al. 2009; Schott 2009:89; Wesseling 2001, p. 275).

Paraquat, at its most benign, can cause skin and mucus membrane irritation, headaches, and nausea, but it can also cross the placental barrier and has been implicated in fetal death in pregnant women who experienced acute poisoning. Long-term exposure has also been linked to Parkinson's disease, suggesting a synergistic relationship to the fungicide ethylene bisdithiocarbamate (Wesseling 2001, p. 282). Wesseling (2001) notes that paraquat is poorly absorbed through intact skin but uptake is substantially improved through breaks and prolonged contact with skin. However the leaves of oil palms and sugarcane plants are sharp, and most workers are subject to cuts on their hands, legs, and heads. Because of the stifling tropical heat, many workers do not wear adequate cover to protect against cuts. And the fact that they are responsible for purchasing their own protective gear and cannot afford to do so increases the likelihood of cuts and pesticide exposure (Houtard 2010).

A study funded by Syngenta, the world's largest agrochemical company and the manufacturer of paraquat, found female pesticide applicators in Malaysia spend more time in contact with paraquat than average agricultural workers. The women sprayed the chemical almost every day (a median of 276 days), and compared with the median 60 hours per year for all users in the study, they spent an incredible 1,560 hours applying the herbicide. The study also found that a higher proportion of Malaysian female field workers had experienced moderate and serious health problems during the study period (Tomenson & Matthews 2009, p. 947). In many cases pesticide applicators are not trained in the proper procedures and do not report their illnesses for fear of losing their jobs (Houtard 2010, p. 92; Rossi & Lambrou 2008; Schott 2009, p. 15).

Smallholder Schemes: Reinscribing the Gendered Division of Labor

Advocates of plant-based energy, when confronted with the ugly realities of working life on the large agrofuel plantations, have pointed to smallholder outgrower opportunities as more preferable forms of "rural development." Theoretically, under this scenario peasants with relatively secure titles to their land can devote some or all of it to cash crops thus earning income for food security and poverty alleviation (Dufey 2006). The World Bank touts the advantages of such arrangements, citing stable incomes, monetization of rural areas as a way to achieve development, and secure land tenure regimes (Carrere 2010; Dufey 2006). Companies provide technical assistance in return for a contractual agreement with the farmer or village guaranteeing a supply of feedstock at per kilo prices that the industry sets. In some cases, contracts can obligate the farmers for longer than 10 years.

While many farmers view the steady income from the companies as welcome financial help, the industry is able to shed any responsibility it would have under a scenario of total proletarianization – it does not have to provide housing, medical insurance, wages, etc. Moreover, it is the producers, not the industry, that directly bear all the costs of production and suffer the risks of market fluctuations and poor harvests. And while companies often supply seedlings, fertilizers, pesticides, and technical expertise, these services are loans that must be repaid with interest at harvest time (Carrere 2010).

Oil palm and *Jatropha* are two crops that can be grown on small plots of land using traditional methods (hand harvesting) and so are often mentioned for rural development and particularly for the benefit of women (Bringezu et al. 2008; Brittaine &

Lutaladio 2010; Cotula et al. 2008; Dufey 2006). However, the existing gendered division of labor in many rural communities simply means that, in addition to their household and gardening work, women are expected to help their husbands or other male members of the family in the agrofuel aspect of farm life while seeing little or none of the proceeds from the sale of the feedstock. Moreover, the labor women perform in agrofuel processing often increases their unpaid time and physical work burden.

For example research indicates that the labor necessary in procuring household water is extensive and almost exclusively a female endeavor. In Kenya 70% of the water carriers are women and girls conveying 80% of household water. Some rural areas in Indonesia 86% of households rely on women's water provision (Ahmed 2000). Women are responsible not only for water provision but also its allocation within the household. This requires precise knowledge of the amount of water it takes to accomplish the day's work which, includes cooking, laundry, washing children and household items, watering small livestock, and the family's garden (Ahmed 2000). In many cases girls accompany their mothers with small containers, graduating to larger vessels as they get older. The containers are heavy, generally weighing 20 kilograms (40 pounds), and large amounts of the time are required to fetch enough for the household. A survey (Rossi & Lambrou 2008) of three sub-Saharan African countries found that, not only do women collect higher volumes of water than men, but they also spend greater amounts of time on water provisioning. A woman in Ghana spends 700 hours while a woman in Tanzania spends 500 hours and a woman in Zambia spends about 200 hours a year.

Cameroon has a long history of traditional palm oil production, and palm oil is used in foods, beverages and medicines. The first extensive plantations were established

in 1910 by the Société des Palmeraies de la Ferme Suisse (SPFS), at the advent of German colonial rule. Later, the French took over Cameroon and instituted slave labor in the plantations, working with local chiefs for the selection of healthy male laborers. The men were marched away with ropes around their necks and forced to work under armed guard; most never saw their villages again. By the 1980's 90% of Cameroon's palm oil production was in the hands of five companies. In 2001 the government launched an initiative to modernize its palm oil industry, including a sub-contracting system that seeks to promote 'complementarity' (Carrere 2010, p. 25) between the large agrofuel processors and smallholders.

Tandon (2009) reports that in the village of Kugwe in northwest Cameroon, oil palm outgrower operations already dominate agriculture, supplying 75% of the community's income. Since women in the village grow the family's food in gardens and process all farm produce, the rise in demand for agrodiesel has increased their unpaid workload. Lacking claim to the trees or discretion over the proceeds from them, female community members nonetheless process the palm kernels, and convey the oil to market. In order to extract the oil from the palm kernels the women use their feet and legs.

Proceeds from the sale of the oil go to the male head of household who gives his female helper seven liters of oil for every forty liters of premium-grade oil she extracts; the seven liters are used for household energy needs. Commonly, women and children gather the leftover palm fibers and squeeze out additional amounts of low-grade oil to add to their share. The head of the household shares the remaining oil with a professional harvester if he has hired one and then turns his portion, about 20 to 40 liters, over to female family members who carry it eight kilometers (about 5 miles) over rough roads to

the main market to sell. The weight of the oil and the long walk places additional stress on women's physical health (Tandon 2009).

Out of the food riots of 2008 and rising criticism of the environmental and social impacts of plant-based transport fuels, a new rhetoric emerged regarding the adoption of *Jatropha* as a "pro-poor" feedstock that would benefit smallholders, particularly women (Brittaine & Lutaladio 2010). Women spend most of their earnings on family food needs. In Africa women produce 80 percent of the food, 60 percent in Asia, and 40 percent in Latin America. Moreover, in one-third of all households in the world, women are the sole breadwinners (Von Lossau & Li 2011). In Tanzania, a national agrofuel company trumpeted the feedstock as the "dollar tree" (Alweny 2008, p. 1) to encourage smallholders to engage in outgrowing operations, while the government of Kenya, international and local NGOs, and the agrofuel industry have sought to implement widespread development of *Jatropha* in "food and fuel" interplanting schemes. Ostensibly, these developments involve smallholders growing the feedstock alongside food crops for local energy use, income generation, and crop protection, but weak government regulation and unscrupulous donor activity has led to a 'free-for-all' of competing interests (Hunsberger 2010, p. 960). Hunsberger (2010) notes that Kenya's history of contested land distribution and agricultural policy problematizes the multiple discourses touting the feedstock as "pro-poor" and a possible solution to climate change. Under British colonial rule Kenya's best fertile land was handed over to settlers for cash-cropping while indigenous Kenyans were prohibited from growing export crops. In the post-colonial era the government encouraged smallholders to engage in cash-crop activity

and opened the country up to foreign investment in agriculture; however, people in the countryside still remain desperately poor (Hunsberger 2010).

Hunsberger found that the primary beneficiaries of the rush to plant *Jatropha* were not the farmers themselves but the NGOs who massaged the discourses of local development and environmental sustainability in order to legitimize their early adoption of the feedstock and maintain funding from reluctant international donors (Hunsberger 2010). Her research also revealed that most (19) of the 25 contacts in her study area had interplanted *Jatropha* with food crops. Some had uprooted maize, beans, and tomatoes to plant the shrub, while others had reduced production of other crops significantly, and four had completely monocropped the feedstock. Most of the farmers expressed frustration that their efforts were going uncompensated, as the shrubs did not produce many seeds in the initial stages and the promised buyback was delayed (Hunsberger 2010, p. 957). One farmer who had participated in a project to grow the feedstock stated, in regret, 'If you get oil, what will you do with it? There's no market' (Hunsberger 2010, p. 949).

In 2008 the *InterPress News Service Agency* (2008) reported that the unstable agrofuel market was seriously affecting farmers who had adopted crop-switching at the behest of the Kenyan government, NGOs, and the industry. In Naromoru, central Kenya, a partnership among the Jomo Kenyatta University of Agriculture and Technology in Nairobi, a NGO, and the Dutch manufacturer Solarix was encouraging farmers to grow castor seeds, but Ann Njeri, a mother of three who runs a small farm outside the town, found herself unable to turn a profit as prices dipped and the market dried up. Another farmer, Linet Kanini from Tala, a town in eastern Kenya, lost all of the money she

invested when the crop of *Jatropha* on her five-acre plot failed to produce an adequate harvest of seeds – only a few kilos (Bwakali 2008).

Researchers studying smallholder schemes in Papua New Guinea (PNG) found that some initiatives aimed at increasing women's participation in the agrofuel economy negatively altered women's economic situation due to traditional gendered household accounting and ultimately eroded community food security. Seeking to maximize profits, the palm oil industry sought a way to incorporate women while simultaneously reinforcing their subordinate role.

Scavenger Wages: Mama Lus Frut

Ninety seven percent of the land in Papua New Guinea is under communal registration; however, the country has undergone resettlement with the advent of cash crops. Following endorsements from the World Bank, the government began encouraging commercial production of oil palms using the Nucleus Estate-Smallholder System (NESS) in 1967 with the aim of diversifying its agricultural export economy. Fifteen thousand smallholders grow half of PNG's 111,000 hectares of oil palms. Large companies own the milling facilities on which the growers are dependent. Oil palm fruit must be processed within 24 hours of harvest, so the labor requirements are high. A family working for two days from sunrise till dark can harvest about 1.7 tons, worth about US$65. After the costs of fertilizers, transportation of the fruit, and other services provided by the company are deducted the payment could be as low are US$20. Women saw very little of this money as the mill owners give preference to male members of

families in matters of negotiation and payment despite a tradition of intra-household cooperation (Schott 2006).

Similarly, altered gender expectations in the community shape the distribution of oil palm funds. Researchers found that there is considerable social pressure on men to spend money gambling and drinking with other men. A husband is expected to pay for mortgages, farm expenses, and wages and to disperse either oil palm fruit or money to his wife to cover household needs, but after that any money left over belongs to him to spend however he likes. On the other hand, women are expected to allocate money to family expenses, and those who spend money on themselves are considered "*greedi*" (Warner & Bauer 2002).

With an eye toward maximizing profits while officially recognizing women's significant contribution to household wealth and food security, the Oil Palm Industry Corporation (OPIC) introduced the *Mama Lus Frut* program to the Popondetta and Hoskins communities as a "poverty reduction" strategy. The program capitalized on women's subordinate role of assisting their husbands by picking up the leftover fruit. Research by the Australian Centre for International Agricultural Research found that, in reality, a high percentage of fruit wastage was occurring before implementation of the scheme and that women preferred to cultivate their gardens and market the produce rather than pick up fruit for nothing. Loss of fruit accounts for as much as 14% of smallholders' harvests representing US$300,000 (APEC 2010; Warner & Bauer 2002). By rewarding the women with a *mama card*, independent of the male wage earner, OPIC was able to recover more fruit. *Mama Lus Frut* was hailed as a major success for "empowering"

women by bringing them into the oil palm market while simultaneously increasing company profits (APEC 2010; Schott 2009; Warner & Bauer 2002).

By 2000 over 3,000 women were involved in *Mama Lus*, and supporters cited a number of "benefits" to the community that, they claimed, reduced household poverty. Among these were women's ability to earn 93% of the average weekly wage for low-skilled workers in the formal sector and increased local trade. They also cited equality in the market as women purchased tools in order to harvest fruit from young palms, thereby increasing their own share of takings while slightly reducing the amount men could harvest. Additionally, they found that the program improved productivity as women tended to clear weeds as they worked (Anderson 2006; Warner & Bauer 2002). All of these benefits, in fact, were positive outcomes for the industry and not the women or their communities.

A 2006 study by Tim Anderson (2006) for the Centre for Environmental Law and Community Rights found that *Mama Lus* formalized the gendered division of labor, as the *papa* card was often 4 times larger than the *mama* card. A study conducted for the Asia-Pacific Economic confirmed this contention, finding that while women participating in the program represented 67% of all smallholders, they earned only 26% of the oil palm money, a weekly average of PGK 27.75 or about US$ 7.00 (APEC 2010). Some women also complained of a decline in the amount of money men were willing to contribute to household accounts after institution of the program.

Moreover, in recognition that the *mama* card is shielded from loan repayments (yet another formalization of male decision-making) the mill in Popondetta (Higaturu), began making deductions from women's cards when officials believed men were using

them to avoid debt repayment for fertilizers and other expenses. Anderson also found that despite pervasive cultivation of oil palms in PNG, Popondetta smallholders were heavily reliant on gardens for food but had a low diversity of garden crops. He noted that the refusal to see customary lands as valuable beyond market assessments places communities at greater risk for poverty. Since women are heavily dependent on their gardens for both household provisioning and income from marketing food, they are at a significant disadvantage in maintaining food security (Anderson 2006).

Follow-up research of 44 female food vendors in Madang in 2008 revealed that informal market activities, particularly roadside vending, earned women substantially higher wages than employment in palm oil work. Growing crops for export and informal sale, the women attended markets an average of three days. Over 85% of the sample group earned more income marketing peanuts, mangoes, melons and betel nuts, than they did selling cocoa, coconut, and vanilla for export. Their average income was found to be more than four times higher than under *Mama Lus* and three times the national minimum wage. Diversity of income and crop cultivation, along with strong access to customary land, is key to the women's success in Papua New Guinea (Sukot 2011).

The particular historical circumstances leading up to the impoverishment of nations and their indigenous peoples are not a concern for the advocates of agrofuels. Instead policy makers, academics, and economists examining the disruption of agrofuel production's concentration of land, destruction of natural resources, and purposeful dispossession of the peasantry and other groups argue that these problems are not inherent qualities of capitalism but are the unfortunate consequences of a natural evolutionary economic process. They claim that the social, economic and environmental

crises produced by agrofuel expansion are simply market failures that can be remedied by market-based reforms (Franco et al. 2010).

Choosing to articulate agrofuel's effect solely from a structural perspective fails to capture the intersections of race, class, and gender operant in local communities. Social structures create social positions, yet individuals and groups occupy social positions (Hill Collins 1995, p. 492). Risman (2004) has suggested that, as theorists, we must integrate analyses at the level of cultural expectation, individual, interaction and organizational structure in order to gain a better understanding of gender in specific communities. Women and men in poor indigenous and rural communities share the same suffering and insecurity, however, gender dynamics play out differently based on the socially acceptable forms of behavior. Agrofuel capitalism's attempt to bring women into the market to augment its accumulation process has not only increased the domestic workload of women but also has disrupted gender relations in local communities further impoverishing them.

CHAPTER VI

CONCLUSION AND FUTURE DIRECTIONS

"Conservation may be a sign of personal virtue, but it is not a sufficient basis for a sound, comprehensive energy policy."

- US Vice President Dick Cheney

This thesis concludes that plant-based liquid fuels are far from renewable, as proponents claim. Agrofuel capitalism is merely the extension of the general acceptance and valorization of the commodity form as the original condition of human relations with nature and with one another. Development banks, university research centers, finance capital, oil, car and agribusiness companies, with the eager assistance of politicians, large NGOs and celebrity environmentalists, have forged an alliance that advances capital's reach into the rural areas of the Global South.

This territorial conversion not only affects the natural environments, economies, and legal frameworks of the Global South; it also extends to the local social relations among groups of people occupying contiguous spaces and also between men and women in the rural areas in which the feedstocks are being cultivated. As Marilyn Waring (1988) has noted, the non-market activities and of people, particularly women, are seen as worthless because they do not contribute to national accounts. Additionally, capital treats the environment and environmental "services" as free gifts to be exploited for the purpose of value creation.

The results of the changing economic and social impacts wrought by agrofuel capitalism are disrupting and/or exacerbating local gender relations that disadvantage women, both discursively and materially. In most cases, women are disadvantaged

because the combination of the masculinist perspective embedded in capitalism employs gender-neutral terms while deploying gendered practices. Gender is also filtered through the organizational level of UN agencies, states, NGOs, development banks and other institutions (Acker 1990; Jessop 2003). These entities are bundles of powers, rather than unified actors, whose members also participate in gendered policy-making with regard to valuation of land-use, knowledge production, biodiversity conservation and labor and project objectives for agrofuel promotion.

This is in keeping with the contentions of Salleh, Waring, and others' arguments that the work of indigenous men and women is undervalued (even by socialist policies) and contributes to displacement, environmental destruction, and the erosion of traditional ecological knowledge. However, the picture of harmony put forward by ecofeminists is undermined by assumptions of universal colonial-style oppression uncomplicated by local gender, race, and political relations (Cochrane 2007; Nanda1997). While in the past, Northern powers feminized colonial men in various ways and forced a renegotiation of local masculinities (Acker 2004), agrofuel capitalism represents a new, more flexible economic ethos with the ability to negotiate across continents with Southern supporters. Southern governments, consisting of integral bundles (Jessop 2003) of power with international connections, impose their own hegemonic gendered regimes with regard to land use and what is considered useful forcing renegotiation of local gender orders. As Waring (1988) has observed micro level informal local gender orders can a large impact on women's agency within their communities and generally result in their disproportionate suffering under most development schemes that privilege market value creation.

Using terms that characterized the lands as "idle," "degraded," "marginal," and thus economically and environmentally unimportant, the message was refashioned to portray a win-win scenario where the supposedly empty lands and economies of the people living near or on them would be revitalized and made productive. However, the concept of "sustainability" obscures the runaway consumption of the North (McMichael 2010) and powerful and autonomous forces in the South whose elites eagerly pour money into less developed nations while forming partnerships with Northern companies and governments (Dauvergne and Neville 2010). Heeding the call to reduce greenhouse gases, lessen dependence on OPEC oil, and augment energy security, governments in both hemispheres have instituted fuel-blending mandates and other market strategies to increase consumption of agrofuels. The national mandates are resulting in a wave of new enclosures in the already impoverished rural areas of the Southern Hemisphere in a rush to claim land, labor, and natural resources such as insolation, soil, and water. Agrofuel development has led to the exacerbation of historical patterns of land concentration, dispossession, and disadvantageous outgrower schemes. It has eroded biodiversity, polluted water and been responsible for deforestation.

Agrofuel feedstock monocropping expands the agricultural frontier causing pressures on rural communities residing or using "wastelands." The grasslands and degraded forests of the Global South are often communal or state-owned lands to which pastoralists, shifting cultivators, small-scale farmers, and hunter-gatherers have informal access. Many rural people who depend on the natural resources in biodiversity-rich areas nearby have suffered historic discrimination and displacement. The people living in these areas can sometimes be very poor and reliant on informal economic activities,

gardening and gathering for market, casual agricultural work and other forms of labor to support themselves. In many cases they possess knowledge of local flora and fauna as well as naturalized introduced species and are actively engaged in cultivation, gathering, fallowing, and burning on the landscape. While their knowledge derives from everyday practice and is confined to local conditions, the significance of their activities and knowledge may have far-reaching importance for global genetic diversity, climate change mitigation, and biodiversity conservation (Salleh 2010).

The destruction of marginal areas affects the poorest people, particularly poor women, who use them for additional income, to bolster food security, and also for fuel and obtaining other resources such as herbs to make medicines. Additionally, women's ethnobotanical knowledge is threatened by the combined pressure of sexism within the community and with regard to outside researchers who study more prominent figures in the community who may or may not need to rely as heavily on local common areas. Agrofuel development exacerbates loss of women's knowledge because in more traditional patriarchal societies women's routine work is often overlooked or undervalued. This is generally due to the differential roles men and women play in household maintenance, health care and community participation.

In Indonesia, researchers found that oil palm plantations are placing great polluting local water sources and placing pressure on environments *Dayak* people actively manage in their *simpukng* (orchard gardens) and *umaq* (rice paddies) landscapes. The highly specialized gardens and fields contain dozens of rice varieties and maintain dipterocarp forests that are home to important tree species and pollinators. *Dayak* men practice controlled burning to renew their farms while older men and only a few women

possess much of the rice knowledge. In the case of Anbera, Indonesia, the *Dayak* people lack of any formal title to forest-land meant that community leaders accepted a move from inconsistently recognized collective rights to head-of-household registration. Hegemonic femininity embodied in *Dayak* cultural proscriptions against women's participation in politics made invisible to the authorities, enabling the state to approach only male leaders. Motivated by land fragmentation and the need for cash, male members of the community traded pieces of land to a state-owned oil palm company in order to enter the plantation system. The shift away from customary *adat* recognition of women's right to inheritance in favor of individual tenure, extended the state's own hegemonic patriarchal assumption with regard to land ownership. However, lack of political voice did not prevent some women from protesting against loss of access by trying various strategies of resistance such as running away from their husbands or demanding to have land registered in their names.

In Tanzania and Kenya *Jatropha* development has advanced as a poverty reduction scheme, aided by NGOs and government agencies against a backdrop of land contestation and forced settlement. Some of the government policies that favor indigenous agrarian practices over those of pastoral people have resulted in more domestic work for women but less food security. Among the *Maasai* gender relations have changed as the consequence of sedentarization policies with women spending more time caring for livestock thus their unpaid labor subsidizes the family leaving less time for them to engage in activities that improve their autonomy within the household. Under this scenario, women must find alternative means of bringing cash. Encouraged by

agrofuel proponents some farmers have engaged in crop-switching and found that there is no market for the oil.

Women's cultivation in "female" crops and their undervalued status means that important food staples can be lost with the destruction of the marginal areas where they do much of their gathering and cultivating. Moreover, the spaces women are allowed to inhabit may also prevent them from them accessing important knowledge possessed by male members of the community as land is fragmented or men are forced to migrate to work elsewhere. In addition to loss of land, pollution of resources increases women's time burden and/or results in loss of income for the poorest communities such as in the cases of *Jatropha* production in Ghana and sugarcane development in Mozambique.

In Ghana, where customary law prevails, Norwegian officials enacted what could be seen as a more colonial-style approach to land-grabbing. Taking advantage of illiterate local officials, BioFuel Africa managed to obtain the consent of the community to clear a large area for *Jatropha* feedstock for export. However, with the help of a Ghanaian NGO local both men and women who saw their crops and fields destroyed were able to recover their land. However, this occurred after the company cleared trees valuable for women's economic activities. After its defeat in one town, the same company moved to another community. In the latter case, they "improved" their community meeting process by cultivating elite leaders and winning over many male farmers but they still ignored the unofficial but very important claims of women marginal areas.

Women's access to marginal land was considered secondary to the men's desire for paid work, leading them to assist the company in keeping government environmental

compliance officials at bay while the areas were cleared of trees and the fast-growing bushes from which women harvested fuelwood. While the immediate effect of loss of the common areas was the destruction women's capacity to bring in more income, it also had a general effect of impoverishing families and increasing food insecurity. Additionally, contraction of the marginal land contributed to land use conflicts between the farmers and the herds-people that also use the area for grazing and routinely burn it. Women were most affected because of the increased pressure on their household responsibilities such as collecting water for cooking and washing, gathering wood for charcoal production for additional household income.

This can also be seen in the case of ProCana in Mozambique where the more powerful Ministry of Agriculture overruled the Ministry of Tourism in the relocation of war survivors and herders in favor of a British agrofuel project. While women have formal equality before the state with regard to land tenure, the gendered division between productive and reproductive labor and according valuation play a role in women's local disempowerment merges with the state's masculinist economic agenda. The activities of pastoralists and displaced people engaged in herding, charcoal processing and other marginally economic activities did not fall under the rubric of "improvement" of the land. Thus, the people occupying the desired area were feminized *en masse* by the state, as their activities were deemed unproductive. Both women and men of lesser status were left out of the process and all lost their ability to farm. Loss of land access is contributing not only to loss of biodiversity and rice knowledge but also forcing communities to "sell" off parts of their land. In other cases military action serving the interests of agrofuel

industry forces people off the land with grave gendered consequences for men and women.

In Colombia the obviously masculinist project of war serves as a convenient veneer for continuing the state's racist legacy of economic and territorial discrimination against Afro-Colombians. Additionally, direct US involvement through direct military training and funding to pursue the "war on drugs", as well as subsidization of former paramilitary combatants' resettlement, is key to widening oil palm development in the country. Under this program, paramilitaries have been emboldened to seize land guaranteed to Black Colombians, openly threatening male community members with the assured implication and knowledge that widowed women's precarious existence, coupled with economic barriers, inevitably guarantees the transfer of communal land through murder, intimidation and sexual assault. Agrofuel production, in most cases, entails displacement and land fragmentation and other serious consequences for local communities causing an increase in migrant work performed by men and women channeled by the racialized and gendered assumptions of large institutions and agrofuel companies.

In Brazil, sugarcane production squeezes indigenous and poor mestizo peasants. But in addition to general insecurity, the country's history of racism contributes to increased misery for indigenous people such as the *Guarani-Kaiowá* who have lost much of their land to agrofuel feedstock development and are often exploited in the cane fields or as casual labor. They often come back during the off-season addicted to drugs or alcohol. *Guarani-Kaiowá* women often have to work farms on their own and suffer at

the hands of dispirited male relatives who beat them; the murder and suicide rate has skyrocketed largely due to displacement and exploitation in the cane fields.

In most cases, women's physical reproductive capacities are considered a liability as in the prohibition against fertile women in Brazil for work in the cane fields where, instead, they often subsidize capital with their unpaid labor in order to help male family members meet tonnage quotas. In other cases assumptions about women's "innate" abilities comes into play as reason to pay them less as in the cases of Indonesia and Malaysia, where the assumption that women are better at lighter tasks requiring precision means they are overrepresented as pesticide applicators in oil palm plantations. The result is that they are exposed to high toxicity levels, as they often cannot afford to pay for the gear required to protect them from the chemicals. One of the most widely used pesticides is paraquat dichloride, which has been implicated in early fetal mortality. Clearly, since female bodies are the ones that produce children, this gendered discrimination has far-reaching social consequences.

In other cases women's bodies are seen assets by companies or by the women themselves. Prostitution has grown in many agrofuel feedstock areas as young women turn to sex work in order to survive. In the case of Indonesia palm oil companies have been implicated in actively employing young *Dayak* women as prostitutes for off-duty farmers and plantation workers. In other scenarios under agrofuel capitalism, companies have found a way to exploit women's position in the domestic division of resources and/or labor. Recognizing the non-pooled nature of households in Papua New Guinea, oil palm companies found a way to recover more profit by initiating *Mama Lus Frut*, a program that paid women for scavenging dropped fruit that would otherwise have

spoiled. Since the program paid less than the wages men garnered, the companies were able to recover large profits. For the women themselves the work was a double-edged sword, providing them with some money, though not as much as from marketing vegetables, yet disrupting relations between husbands and wives and among women in the community.

These changes and renegotiations come as the buzzword "sustainability" spawns conferences, focused action and even university degrees in the Global North, all accompanied by dire warnings of climate change, biodiversity loss and vanishing oil reserves. And while the words of Dick Cheney may be repugnant to most Northern progressives, they underpin the practices embodied by agrofuel development, because they do not spark questions of equitable distribution of resources and burdens. By refusing to interrogate its own irresolvable contradictions, capital seeks to greenwash its aims by glorifying first and second-generation plant-based fuels as both icons of virtuous behavior and equitable energy policy. In fact, their development is simply leaner, meaner accumulation masquerading in the cloak of "sustainability." The alternative fuels' billing as symbols of environmental sustainability, sound development policy, and progressive thinking resonate deeply with the "green" ideals put forward by US and European progressive movements that emphasize consumer identity and action over fundamental economic restructuring.

However, to restate the case against agrofuels is not enough. Judging from the work on agrofuels that focus on the narrow political economic or agrarian conception as well the UN and NGO literature that accepts the current economic system as an ontological fact, it is important to highlight the viability of the non-market rift-healing

activities of those nominally outside capital's reach. With regard to the Global South, postcolonial and ecofeminist theorists call for greater valuation of their subsistence labor and activities in preservation of the environment and they are right to do so. But they do not address larger and also infinitely smaller questions such as per capita energy use, health/well-being and the distribution of hazards. Uncritical depictions of indigenous men and women engaging in the "joy" (Salleh 2010: 212) of collective work obscures the poverty, local elitism and nature of local power relations that fuse religion with political power as well as a gendered division of labor that causes rural women and their children to carry heavy loads for hours and miles to provide fuel and water for their households. There is nothing joyful about being disabled by the age of 35 from carrying water all your life, as is the case for some *Maasai* women (Ahmed 2000, p. 13). The cruel irony for women in the Global South is that agrofuel capitalism not only exploits their lower social status but also increases their workload as they walk longer distances for fuel or spend precious income to buy it. Wealth, energy and human wellbeing are linked.

Cathy's Emissions/Tendai's Drudgery: The Case for Energy Justice

Studies show a higher Human Development Index (HDI) associated with energy use (Martínez and Ebenhack 2008). The HDI was developed by United Nations Development Program (UNDP) to measure indicators of human quality of life such as life expectancy, educational attainment, and income; the scale ranges from 0.0 to 1.0 (Klugman 2010). Martínez and Ebenhack (2008) found that countries with high per person energy consumption rates had low HDIs and countries with very low consumption had low HDIs. Significant to this paper, the authors also found that "energy-advantaged

countries" (Martínez and Ebenhack 2008, p. 1432) used excessive amounts of energy with no increased benefits to their citizens. Not surprisingly, the countries with the highest HDIs and consumption levels were in the Global North while the countries with the lower wellbeing and consumption patterns were in the South. And while the authors noted that some inefficiencies in transportation and industry could be realized, advantaged countries would not realize any more gain in HDI. By contrast, they found that one major factor contributing to a lower HDI was the quality of primary fuel.

Lack of access to modern energy services, known as "energy poverty," forces poor families to use traditional solid fuels (biomass) to meet their day-to-day energy needs. Nearly half of the world's people rely on solid fuels for cooking and heating; 2.4 billion people use biomass (wood, charcoal, dung and crop waste) while 0.6 billion burn coal. The division of labor, placing most of the household responsibilities on women and girls, often prevents them from attending school and participating in community activities as a great deal of their time is taken up gathering fuel and cooking food. Moreover, women and girls also suffer from problems associated with traditional fuel use.

Women in the South use cooking fires to prepare and process food, to heat their homes and to run small enterprises such as beer brewing and bread baking. The low energy content and incomplete combustion of biomass combined with the fact that the fuels are used indoors results in indoor pollution of carbon monoxide, particulate matter, benzene and other dangerous compounds. These indoor fires are responsible for 2 million deaths per year from pneumonia, lung cancer, and chronic respiratory diseases. One million of those deaths are children under the age of five.

What is needed is not more capital accumulation for the world's greedy corporate giants but fuel for the South's people. While the works of many ecofeminists very importantly exposes capitalism's disregard for indigenous populations, their wholesale rejection of all development, if heeded, is "defending nothing more than the right of non-Western 'others' to be exploited by their own local overlords" (Nanda 1995). Moreover, ecofeminist arguments do not address larger and also infinitely smaller questions such as per capita energy use, health/well-being and the distribution of hazards.

The energy and environmental picture is far more complicated, as Dauvergne and Neville (2010) have observed, with powerful actors emerging in the South and growing South-South relationships that obscure partnerships between Southern elites and Northern corporate interests to the ultimate detriment of poor rural people. The energy consumption of the least privileged people in the Global South must rise as a matter social justice as well as climate change mitigation/adaptation. Small-scale biofuel and solar electrification projects as well as judicious use of petroleum products must be a priority. Assessments of the energy-poverty-environment nexus must integrate the role of science in tackling the climate change and environmental destruction and highlighting the metabolic value just social relations.

From Metabolic Rift to Situated Knowledges

Donna Haraway's "Situated Knowledges" lays the groundwork for a new feminist grasp of the concept of objectivity. Haraway states that feminist scholars and activists have been seduced by two opposing poles of a dichotomy with regard to understanding the production of knowledge: radical social constructivism and feminist empiricism.

Social constructivism views all knowledge claims, particularly those of science and technology, as serving the dominant economic and political interests in/of Western society. On the other hand feminist empiricism draws on the Marxian demand for rigorous objectivity while eschewing semiotic or narrative constructions of lived experience. Situated knowledges seek to expose the myth of objectivity in the "conquering gaze from nowhere" that serves capitalism, military conquest and patriarchy. By recreating a metaphorical understanding of vision as an embodied, historical and particular location, feminists can subvert what Haraway calls the "god trick" – the allegory of a distant, infinite and totalizing representation of truth. These contesting and contested partial knowledges link together communities to form a collective subject standpoint.

Clearly, the consequences of capitalist expansion, aided by the scientific community, have impacted indigenous cultures across the globe. Supported by bourgeois scientific views that prioritize capital accumulation, agrofuel proponents contend that intensive agricultural and livestock production can avert further biodiversity loss and deforestation. However as this paper has shown, the low-impact, intentional activities of local people can be responsible for *in situ* biodiversity conservation. As this paper also demonstrates, the characterization of "marginal" lands as "unproductive" both in ecological and economic terms and thus appropriate for agrofuel development is a falsification that exacerbates historical exclusions, increases environmental damage and particularly disadvantages women.

Therefore it is absolutely crucial to heed Salleh's (2010) call for new "metabolic value" (212) relations that take into account the work of people actively engaged in direct

interaction with wild areas as well as the unremunerated labor of those doing provisioning work in the industrialized world. She notes that the science of ecology recognizes webbed connections, yet concludes that to avoid "exploitation and entropy" the South should "delink from the global North and its programs" (211). This is a dangerous idea. Her reasoning reproduces the reductive logic she seeks to challenge by locating "nature" and "indigenous" in the South excluding people of color and working class white people in the North whose transnational links have been crucial in the fight for environmental justice (Pellow 2007). Further, the equation of all scientific endeavors with capitalist relations hampers important partnerships among indigenous people, farmers in the North, ecologists and social justice organizations.

Scientists, indigenous people and activists in both hemispheres possess knowledge and skills of global, not simply local significance. Rather than advocating delinkage, we as scholars, must support dynamic knowledge production between associated producers and scientists. I believe that science-with-integrity coupled with movements for environmental justice can turn back the assaults on local communities and hasten the demise of the economic system that perpetrates them. Some forms of community conservation (Berkes 2004) represents the best of Haraway's concept. Many community conservation ecologists are advocating for a "re-embodiment" (Bradshaw and Bekoff 2001) of science, a more socially conscious ecology that can fulfill its mandate to uncover the truth while also serving society. Bradshaw and Bekoff argue for a complexity theory that integrates the so-called hard (biophysical) and the soft (social) sciences to reflect the dynamic relationship between nature and humans where "Observers, science and scientists, are brought into the relationship with the observed, humans and nature"

(Bradshaw and Bekoff 2001, p. 463). This form of knowledge production recognizes the dynamic role between humans and nature, refuses the mining of traditional knowledge by outsiders, privileges knowledge sharing and local empowerment over monetary relations and de-centers the idea of conservation in favor of time-tested traditions (Berkes 2004). As scholars, we must demand, not a withdrawal/denial of all science but the destruction of *bourgeois* science.

My Development

The dispossession and poverty visited word upon local communities by the greedy corporate giants often has local support, state funding and articulates nicely with historic patterns of racial/ethnic oppression and hegemonic gender regimes. What I have learned through the researching, contemplating and writing of this thesis is that it is vitally important to recognize and identify a multiplicity of connections and tensions while not losing sight of the ultimate goal of capitalism and its overthrow. Salleh (2010), quoting fellow materialists, Brett Clark and Richard York, emphasizes the need to rise above the social relations that create and perpetuate metabolic rifts in the first place. Her specific critique of metabolic rift theorists is that they refuse to make analytic space for gender and race. I wholeheartedly agree with her. It is disheartening to read gender and race scholarship reduced to a limited collection of citations with little textual engagement in the actual theoretical concepts.

However, it is also imperative to recognize the contingent, unstable and contested character of these identities/locations. Just as capitalism has a structural form with local resonances so do gender and race. And as Acker (2004) and others (Connell and

Messerschmidt 2005; Jessop 2003; Salleh 2009; Waring 1988) contend, the dominant voices theorizing and describing globalization are, for the most part, similar if not identical to those in academic and activist settings criticizing global capital in general. Their discourse assumes gender and race neutrality and obscures the implicit masculine and Northern white standpoint of globalization and their own locations. These convergences have material consequences.

Lourdes Benería (2003) notes that right wing activity in the 1980's shifted the focus of feminist scholars in the North away from structural critiques and led to an emphasis on the differences among women and toward productive discussions of gender and race as unstable, contestable and renegotiated categories. She also observes that academic exchanges were often confined within the humanities and literary fields but also had a strong influence on the social sciences. The unfortunate move toward defining these categories as "culturally constructed" signaled a shift away from materiality. With the exception of feminist economics, the material workings of gender have been largely neglected. I agree with her assertion and contend that there is a surprising dearth of scholarship linking issues of gender, environment and critiques of capitalism. This is the case despite the ubiquitous presence of women in many environmental organizations and the particularly radical leadership of women of color in environmental justice activism (Bullard and Smith 2005).

As feminist academics we must begin demystifying capitalist relations and the metabolic rift by engaging in a theorizing that does not replicate the savage "last man standing" competition that characterized early capitalist development. Capitalism's forté is divisiveness, competition and authorization of commodity relations over people's

needs and aspirations. Gender scholar Barbara Risman suggests that gender research must dispense with the theory slaying she calls the "modernist warfare version of science" and instead engage multidimensional, integrative theories that pay attention to gendered selves, the cultural expectations that determine interactional relations and the institutional rules that inform academic disciplines. To that list I would like to add "material realities". I have attempted here to move from a synthesis of case studies and empirical data toward a feminist political ecology of the gendered impacts of agrofuel development pointing the way toward more interdisciplinary research integrating the material aspects of energy, environment and gender. I hope this thesis advances that mission.

REFERENCES CITED

Acker, J. (1988). Class, gender, and the relations of distribution. *Signs, 13*(3), 473-497.

Acker, J. (1990). Hierarchies, jobs, bodies: a theory of gendered organizations. *Gender and Society, 4,* 139-158.

Acker, J. (2004). Gender, capitalism and globalization. *Critical Sociology, 30*(1), 17-41. doi: 10.1163/156916304322981668

Acker, J. (2006). *Class questions feminist answers.* Lanham, MD: Rowman & Littlefield.

ActionAid. *Facing the facts: Experiences of the biofuels boom.* Washington: ActionAid International USA. Retrieved from: actionaidusa.org/assets/pdfs/food_rights/Faces.pdf

Ahmed, H. (2000, December). *The benefits of water improvement programs to women: A literature review.* (Staff paper #2000-20). East Lansing: Dept. of Agricultural Economics, Michigan State University.

Alcoff, L. (1991-1992 Winter). The problem of speaking for others. *Cultural Critique, 2,* pp. 5-32.

Alweny, S. (2008, May). *Potential boom for biofuels in Tanzania?* Paper generated by the International Symposium for Underutilized Plant Species, Arusha, Tanzania, March pp. 2-7.

Altieri, M. A. (2009). Ecological impacts of large-scale agrofuel monoculture production systems in the Americas. *Bulletin of Science Technology and Society, 29*(3), 236-244. doi: 10.1177/0270467609333728

Amiri, B. (2011, March 3). 'We denounce the militarisation of our lives.' *Inter Press News Service.* Retrieved from: http://ipsnews.net/print.asp?idnews=54710

Anderson, T. (2006, May). *Oil palm and small farmers in Papua New Guinea*. Report for the Centre for Environmental Law and Community Rights on the economic prospects for small farmers in PNG's oil palm industry. Australia: University of Sydney.

Apusigah, A. A. (2009, December). The gendered politics of farm household production and the shaping of women's livelihoods in Northern Ghana. *Feminist Africa, 12,* 51-68. Capetown: African Gender Institute.

Araghi, F. (2000). The global enclosures of our times. In F. Magdoff, F.H. Buttel and J.B. Foster (Eds.). *Hungry for profit*: *the agribusiness threat to farmers, food, and the environment*. (pp.145-160). New York: Monthly Review Press.

Asia-Pacific Economic Cooperation Secretariat (APEC). (2010, February). *A study of employment opportunities from biofuels in APEC economies.* (APEC#210-RE-01.9). Singapore: Energy Working Group of APEC.

Assis, W.F.T. & Zucarelli, M.C. (2007). *De-Polluting myths: Territorial impacts of the expansion of energy monocultures in Brazil*. Brazil: Friends of the Earth Brazil, Vitae Civilis Institute and Ecoa – Ecologia & Ação.

Associated Press. (2007, March 9). Bush heralds biofuel pact Friday with Brazilian leader. *KEPRTV.* Retrieved from: http://www.keprtv.com/news/national/6399162.html

Avery, D. (2006, April 21). Is Greenpeace condemning the Amazon rain forest? Retrieved from Center for Global Food Issues website: http://www.cgfi.org/2006/04/is-greenpeace-condemning-the-amazon-rain-forest/

Bacon, D. (2007, July 18). Blood on the palms: Afro-Colombians fight new plantations. *Dollars and Sense.*

Ballvé, T. (2009, June 15). The dark side of Plan Colombia: New evidence shows that narco-traffickers may have benefited from USAID biofuel grants. *The Nation,* pp. 22-32.

Banse, M., van Meijl, H., Tabeau, A. and Woltjer G. (2008, 7 – 9 June). *Impact of EU biofuel policies on world agricultural and food markets*. Paper presented at the Tenth Annual Conference on Global Economic Analysis. West Lafayette, IN: Purdue University. Retrieved from: erae.oxfordjournals.org/cgi/content/full/35/2/117

BBC News. (2007, 10 March). US-Brazil deal to boost bio-fuels: The United States and Brazil have signed an agreement to develop alternative fuel sources. *BBC News.* Retrieved from: http://news.bbc.co.uk/2/hi/6434889.stm

Behrman, J., Meinzen-Dick, R. & Quisumbing, A. (2011, January). *The gender implications of large-scale land deals* (Discussion Paper 01056). International Food Policy Research Institute.

Benería, L. (2003). *Gender, development, and globalization: Economics as if all people mattered.* London: Routledge.

Big Noise Films, et al (Producer). (1999, November/December). *Showdown in Seattle: 5 days that shook the WTO.* [Video]. Seattle USA: Independent Media Center. Available from: http://www.whisperedmedia.org/showdown.html

Biofuelwatch UK et al. (2007). *Agrofuels: Towards a reality check in nine key areas.* Retrieved from: www.carbontradewatch.org/pubs/Agrofuels.pdf

Biondi, A., Monteiro, M., & Glass, V. (2008). *Brazil of biofuels: Impacts of crops over land, environment and society – sugarcane.* Repórter Brasil.

Borger, J. (2008, June 3). US biofuel subsidies under attack at food summit. *The Guardian.* Retrieved from: http://www.guardian.co.uk/environment/2008/jun/03/biofuels.energy

Borras, S.M., Jr. Agrarian change and peasant studies: changes, continuities and challenges – an introduction. *The Journal of Peasant Studies. 36*(1): 5-31. doi: 10.1080/03066150902820297

Borras, S.M., Jr., Fig, D., & Suárez, S. M. (2011). The politics of agrofuels and mega-land and water deals: insights from the ProCana case, Mozambique. *Review of African Political Economy, 38*(128), 215 – 234. doi: 10.1080/03056244.2011.582758

Bouvier, V. (2011, November 17). Building community in the search for justice: A visit to Colombia's city of women. United States Institute of Peace. Retrieved from: http://www.usip.org/in-the-field/building-community-in-the-search-justice-visit-colombias-city-women

British Petroleum (BP). (2011). BP brand and logo. Available from the BP website: http://www.bp.com/sectiongenericarticle.do?categoryId=9014508&contentId=7027677

Bringezu, S., Schütz, H., O´Brien, M., Kauppi, L., Howarth, R. W., McNeely, J. (2009). *Towards sustainable production and use of resources: Assessing biofuels.* Germany: UNEP.

Brittaine, R., & Lutaladio, N. (2010). *Jatropha: A smallholder bioenergy crop. The potential for pro-poor development.* (Vol. 8-2010). Rome: FAO.

Bubela T., Rodriguez Jr. E. B., Metcalf, C., Nnadozie, K., Rodrigues, E. & Carbone, J. (2008). *Respecting, promoting, and protecting traditional knowledge: a comparative case study of Brazil, Kenya and Northern Canada*. Montreal: The Innovation Partnership. Retrieved from the TIP website: http://www.theinnovationpartnership.org/en/ieg/cases/

Bush, G. W. (2008, March 5*), President Bush attends Washington international renewable energy conference 2008.* Washington: Office of the Press Secretary. Retrieved from: http://www.whitehouse.gov/news/releases/2008/03/20080305.html

Bwakali, J. D. (2008, October 24). Biofuel boom and bust. *Inter Press Service News Agency*. Retrieved from: http://ipsnews.net/africa/nota.asp?idnews=44438

Caluza, D. (2008, December 10). Jatropha displacing Mindanao food crops. *Inquirer.net.* Retrieved from: http://newsinfo.inquirer.net/inquirerheadlines/regions/view/20081210-177076/Jatropha-displacing-Mindanao-food-crops

Carlson, K.M. and Curran, L.M, (2009, September 14-16). *Impacts of oil palm plantations on water quality in Indonesian Borneo.* Paper presented at the International Conference on Forests and Water in a Changing Environment, U.S. Forest Service.

Carrere, R. (2010). *Oil palm in Africa: Past, present and future scenarios.* (Tree plantations series, No. 15). World Rainforest Movement. Retrieved from: wrm.org.uy/countries/Africa/Oil_Palm_in_Africa.pdf

Cecelski, E. (2004, May). Re-thinking gender and energy: Old and new directions. *ENERGIA/EASE.*

Clancy, J. S., Oparaocha, S. & Roehr, U. (2004, February). *Gender equity and renewable energies.* Paper presented at the International Conference for Renewable Energies, Bonn Germany.

Cochrane, R. (2007). Rural poverty and impoverished theory: Cultural populism, ecofeminism, and global justice. *The Journal of Peasant Studies, 34*(2), 167-206 doi: 10.1080/03066150701516674

Colchester, M., Jiwan, N., Andiko, Sirait, M., Firdaus, A.Y., Surambo, A., & Pane, H. (2006). *Promised land. Palm oil and land acquisition in Indonesia: Implications for local communities and indigenous peoples.* Moreton-in-Marsh, UK: Forest Peoples Programme and Perkumpulan Sawit Watch.

CNN. (2008, April 14). Riots, instability spreads as food prices skyrocket. Retrieved from *CNN.com/world* website: http://www.cnn.com/2008/WORLD/americas/04/14/world.food.crisis/#cnnSTCTex

Collins, P. H., et al. (1995). Symposium on West and Fenstermaker's 'doing difference.' *Gender and Society, 9*(4), 491-513. doi:10.1177/089124395009004006

Connell, R.W. & Messerschmidt, J. W. (2005). Hegemonic masculinity: Rethinking the concept. *Gender and Society, 19*(6), 829-859.

Conservation International. (2011). *Biodiversity hotspots.* Retrieved from CI website: http://www.conservation.org/where/priority_areas/hotspots/Pages/hotspots_main.aspx

Cotula, L., Dyer, N. & Vermeulen, S. (2008). *Fuelling exclusion? the biofuels boom and poor people's access to land.* (No. 12551IIED) London: International Institute for Environment and Development (IIED) and United Nations Food and Agricultural Organization (FAO).

Cuomo, C. J. (2001). Still fooling with mother nature. *Hypatia, 16*(3), 149 -156.

Danielsen, F., Beukema, H., Burgess, N.D., Parish, F., Brühl, C.A., Donald, P.F., Murdiyarso, D., Phalan, B., Reijnders, L., Struebig, M., and Fitzherbert, E.B. (2008, April). Biofuel plantations on forested lands: Double jeopardy for biodiversity and climate. *Conservation Biology*, 23 (2), 348–358. doi: 10.1111/j.1523-1739.2008.01096.x

De Fraiture, C., Giordano, M. & Liao, Y. (2008). Biofuels and implications for agricultural water use: Blue impacts of green energy. *Water Policy, 10* (1), 67–81.

Dominguez-Faus, R., Powers, S.E., Burken, J.G. and Alvarez, P. J. (2009). The water footprint of biofuels: A drink or drive issue? *Environmental Science and Technology, 43*(9), 3005–3010. doi: 10.1021/es802162x

Directorate-General for Energy and Transport (2004). *Promoting biofuels in Europe: securing a cleaner future for transport*. Brussels: European Commission.

Crane, R. & Takahashi, L. (2009). Sex changes everything: the recent narrowing and widening of travel differences by gender. *Public Works Management Policy, 13*(4): 328-337. doi: 10.1177/1087724X09335608

Dauvergne, P. & Neville, K. J. (2010). Forests, food and fuel in the tropics: the uneven social and ecological consequences of the emerging political economy of biofuels. *The Journal of Peasant Studies, 37*(4): 631-660.

Deere, C.D. & León, M. (2001). Institutional reform of agriculture under neoliberalism: the impact of the women's and indigenous movements. *Latin American Research Review, 36*(2), 31-63.

Denton, F. (2000). Gendered impacts of climate change – a human security dimension. *Energia, 3*(3). Retrieved from: http://www.energia.org/fileadmin/files/media/EN102000_denton.pdf

Dufey, A. (2006). *Biofuels production, trade and sustainable development: emerging issues.* London: International Institute for Environment and Development (IIED).

DuPuis, E. M., Harrison, J. L., & Goodman, D. (2011). Just food? In A. Hope & J. Agyeman (Eds.), *Cultivating food justice: Race, class and sustainability* (pp. 284-307). Cambridge: MIT Press.

Energy Biosciences Institute. (2011). Research programs. Retrieved from EBI website: http://www.energybiosciencesinstitute.org/

ENERGIA (2006, April 20). *Relieving Women's Household Burdens.* Retrieved from ENERGIA website: www.energia.org/fileadmin/files/media/factsheets/factsheet_hhe.pdf

Ernsting, A. (2007, July). Agrofuels in Asia: fuelling poverty, conflict, deforestation and climate change. *Seedling*, [Agrofuels special issue]. Barcelona: GRAIN.

Eyzaguirre, P. B. & Dennis, E.M. (2007). The impacts of collective action and property rights on plant genetic resources. *World Development, 35* (9), 1489–1498. doi:10.1016/j.worlddev.2006.05.017

FAO. (2009). *Gender equity in agriculture and rural development: A quick guide to gender mainstreaming in FAO's new strategic framework.* Rome: Gender, Equity and Rural Employment Division of Economic and Social Development Department, UNFAO.

Fargione, J., Hill, J., Tillman, D., Polasky, S. & Hawthorne, P. (2008). Land clearing and the biofuel carbon debt. *Science, 319*(5867), 1235-1238.

Food First. (2007, March 7). Women in Brazil protest Bush's visit: The poor refuse to grow fuel for the rich. *Institute for Food & Development.* Retrieved from: http://www.foodfirst.org/node/1654

Foster, J. B. (2000). *Marx's ecology: Materialism and nature*. New York: Monthly Review Press.

Franco, J., Levidow, L., Fig, D., Goldfarb, L., Hönicke, M., & Mendonça, M.L. (2010). Assumptions in the European Union biofuels policy: frictions with experiences in Germany, Brazil and Mozambique. *The Journal of Peasant Studies, 37*(4), 661-698. doi:10.1080/03066150.2010.512454

Frayssinet, F. (2007, June 13). Agriculture-Brazil: David, Goliath and Land Reform. *Inter Press Service News Agency*. Retrieved from: http://ipsnews.net/print.asp?idnews=38161

Friends of the Earth, LifeMosaic & Sawit Watch (2008, February). *Losing ground: The human rights impacts of oil palm plantation expansion in Indonesia*. Retrieved from: www.lifemosaic.net/pdf/losingground-summary.pdf

Gaia Foundation et al. (2008, September 19). *Agrofuels and the myth of marginal lands.* Available from: http://www.landaction.org/spip/spip.php?article362

Gaye, A. (2007). *Fighting climate change: Human solidarity in a divided world.* Retrieved from United Nations Development Program website: hdr.undp.org/en/reports/global/hdr2007-8/papers/Gaye_Amie.pdf

Gerbens-Leenes, W., Hoekstra, A. Y. & Van der Meer, T. H. (2009). *Proceedings of the National Academy of Sciences, 106*(25), 10219-10223. doi: 10.1073/pnas.0812619106

German, L. et al. (2010, December). *The local social and environmental impacts of biofuel feedstock expansion: A synthesis of case studies from Asia, Africa and Latin America* (Brief No. 34). Retrieved from the Center for International Forestry Research website: www.cifor.org/publications/pdf_files/infob...3295-infobrief.pdf

Gerstenzang, J. (2008, 3 May) Ethanol defended by president Bush. *Los Angeles Times.* Retrieved from: http://www.latimes.com/news/nationworld/nation/la-na-bush3-2008may03,0,4594559.story

Glenn, E. N. (1999). The Social Construction and Institutionalization of Gender and Race: An Integrative Framework. In M.M. Ferree, J. Lorber & B.B. Hess (Eds.), *Revisioning gender* (pp. 45-75). Thousand Oaks, CA: Sage.

Goldman, M. & Schurman, R. A. (2000). Closing the "great divide": New social theory on society and nature. *Annual Review of Sociolog, 26,* 563-584.

GRAIN. (2007, July). Biodiversity, rights and livelihood. [Agrofuels special issue]. *Seedling.* Barcelona: GRAIN.

Gray, L. & Kevane, M. (1999). Diminished access, diverted exclusion: Women and land tenure in Sub-Saharan Africa. *African Studies Review, 42*(2), 15-39.

Guerrero, P. (2010, July). The city of women: A Colombian experience. In [Special edition on gender and housing] *Bulletin on housing rights and right to the city in Latin America 3*(8). Centre On Housing Rights and Evictions.

Hannah, J. (2007). *Women pastoralists: Preserving traditional knowledge, facing modern challenges.* Bonn, Germany: Secretariat of the United Nations Convention to Combat Desertification (UNCCD).

Hanotte, O., Bradley, D.G., Ochieng, J.W., Verjee, Y., Hill, E.W. & Rege, J.E.O. (2002). African pastoralism: Genetic imprints of origins and migrations. *Science 296*, 336-339. doi: 10.1126/science.1069878

Haralambous, S., Liversage, H. & Romano, M. (2009, February 18-19). *The growing demand for land: Risks and opportunities for smallholder farmers.* Paper presented at Thirty-second session of International Agricultural Development's Governing Council, Rome.

Haraway, D. (1988). Situated knowledges: The science question in feminism and the privilege of partial perspective. *Feminist Studies, 14*(3), 575-599.

Haraway, D. (1991). *Simians, cyborgs and women: The reinvention of nature.* New York: Routledge.

Hari, J. (2010, March 22). The wrong kind of green. *The Nation.* Retrieved from The Nation website: http://www.thenation.com/doc/20100322/hari/print

Hartsock, N.C.M. (1983). *Money, sex and power: Toward a feminist historical materialism.* Boston, MA: Northeastern University Press.

Harvey, D. (1996). *Justice, Nature and the Geography of Difference*. Cambridge, MA: Blackwell Publishers.

Hecht, S. B. (2011). The new Amazon geographies: Insurgent citizenship, "Amazon Nation" and the politics of environmentalisms, *Journal of Cultural Geography, 28*(1), 203-223. doi: 10.1080/08873631.2011.548500

Heller, G. (2008, April 17) Bad policy, not biofuel, drive food prices: Merkel. *Reuters Africa*.Retrieved from Reuters: http://www.reuters.com/article/2008/04/17/us-germany-biofuels-idUSL1721113520080417 (Accessed 27 January 2011).

Hendra, M., Guhardja, E., Setiadi, D., Walujo, E.B., Purwanto, Y. (2009). Cultivation practices and knowledge of local rice varieties among Benuaq farmers in Muara Lawa District West Kutai, East Kalimantan-Indonesia. *Biodiversitas, 10*(2), 98-103.

Hesse, C. & MacGregor, J. (2009, June). *Arid waste? Reassessing the value of dryland pastoralism*. London: International Institute for Environment and Development.

Holleman, H. & Clausen, R. (2008, January 15). Biofuels, BP-Berkeley, and the new ecological imperialism. Retrieved from the *MRZine* website: mrzine.monthlyreview.org/2008/hc160108.html

Holt-Gimenez, E. & Kenfield, I. (2009). When renewable isn't sustainable: Agrofuels and the inconvenient truths behind the 2007 U.S. Energy Independence and Security Act. In R. Jonasse (Ed.), *Agrofuels in the Americas.* (pp. 25-39). Oakland, CA: Institute for Food and Development Policy.

Holt-Gimenez, E. & Shattuck, A. (2009). The agrofuels transition: Restructuring places and spaces in the global food system. *Bulletin of Science Technology and Society, 29*(3), 180-188. doi: 10.1177/0270467609333730

Holt-Gimenez (2011). Food security, food justice, or food sovereignty? Crises, food movements, and regime change. In A. H. Alkon & J. Agyeman (Eds.), *Cultivating food justice: Race, class and sustainability.* (pp. 309-330).

Houtard, F. (2010). *Agrofuels: Big profits, ruined lives and ecological destruction.* (V. Bawtree, Trans.). London: Pluto Press.

Howard, P.L. (Ed.) (2003). *Women and Plants: Gender Relations in Biodiversity Management & Conservation.* London: Zed Books.

Howard, P.L. & Nabanoga, G. (2007). Are there customary rights to plants? An inquiry among the Baganda (Uganda), with special attention to gender. *World Development, 35*(9), 1542–1563. doi:10.1016/j.worlddev.2006.05.021

Hunsberger, C. (2010): The politics of *Jatropha*-based biofuels in Kenya: Convergence and divergence among NGOs, donors, government officials and farmers. *The Journal of Peasant Studies, 37*(4), 939-962. doi: 10.1080/03066150.2010.512465

IFAD (2011). *Rural poverty report 2011: New realities, new challenges: New opportunities for tomorrow's generation.* Rome: International Fund for Agricultural Development.

Jacob, M. O., Farah, K. O. & Ekaya, W. N. (2004). Indigenous knowledge: The basis of the Maasai ethnoveterinary diagnostic skills. *Journal of Human Ecology 16*(1), 43-48.

Jessop, B. (2003). The gender selectivities of the state. *Lancaster Department of Sociology.* Lancaster, England. Retrieved from: http://comp.lancs.ac.uk/sociology/soc soc073rj.html

Julia & White, B. (2011, April 6-8). *The gendered politics of dispossession: Oil palm expansion in a Dayak Hibun in West Kalimantan, Indonesia.* Paper presented at the International Conference on Global Land Grabbing organized by the Land Deals Politics Initiative and the Journal of Peasant Studies, University of Sussex, England.

Kabeer, N. (1994). *Reversed realities: Gender hierarchies in development thought.* London: Verso.

Kay, J. H. (1998). *Asphalt nation: How the automobile took over America, and how we can take it back.* Berkeley: University of California Press.

Kelly, A. B. (2011). Conservation practice as primitive accumulation. *The Journal of Peasant Studies, 38*(4), 683-701. doi: 10.1080/03066150.2011.607695

Kipuri, N. & Ridgewell, A. (2008). *A double bind: The exclusion of pastoralist women in the East and Horn of Africa.* UK: Minority Rights International.

Kipuri, N. & Sørensen, C. (2008). *Poverty, pastoralism and policy in Ngorongoro: Lessons learned from the Ereto I Ngorongoro pastoralist project with implications for pastoral development and the policy debate.* ERETO/IIED.

Klink, C. A. & Machado, R. B. (2005). Conservation of the Brazilian cerrado. *Conservation Biology, 19*(3), 707-713. doi: 10.1111/j.1523-1739.2005.00702.x

Klugman, J. (2010). *The human development report 2010.* New York: United Nations Development Programme.

Koh, L .P. & Ghazoul, J. (2008). Biofuels, biodiversity and people: Understanding the conflicts and finding opportunities. *Biological Conservation 141*(10), 2450-2460. doi: 10.1016/j.biocon.2008.08.005

Lambrou, Y. & Laub, R. (2006). *Gender, local knowledge and lessons learnt in documenting and conserving agrobiodiversity.* (Research Paper No. 2006/69). Rome: United Nations World Institute for Development Economics Research (UN-WIDER).

Lavin, C. (2009, November 3). Pollanated politics, or, The neoliberal's dilemma. Retrieved from: http://www.politicsandculture.org/2009/11/03/chad-lavin-pollanated-politics-or-the-neoliberal%E2%80%99s-dilemma/

Lewontin, R. & Levins, R. (2007). *Biology under the influence: Dialectical essays on ecology, agriculture, and health*. New York: Monthly Review Press.

Mackenzie, F. D. (2010). Gender, land tenure and globalisation: exploring the conceptual ground. In D. Tsikata & P. Golah (Eds.), *Land tenure, gender and globalisation: research and analysis from Africa, Asia and Latin America*, (pp. 35-70). Ottawa: International Development and Research Centre.

Maestas, A. (2011, March 22). *International sustainable biofuels certification system unveiled: Producers must meet environmental and climate safeguards.* Retrieved from: http://www.nwf.org/News-and-Magazines/Media-Center/News-by-Topic/Global-Warming/2011/03-22-11-Sustainable-Biofuels-Certification-System-Unveiled.aspx

National Film Board of Canada (Producer) & Nash, T. (Director). (1995). *Who's counting? Marilyn Waring on sex, lies and global economics* [Video]. Canada. Available from: http://www.bullfrogfilms.com/catalog/whoo.html

National Wildlife Federation website: http://www.nwf.org/News-and-Magazines/Media-Center/News-by-Topic/Global-Warming/2011/03-22-11-Sustainable-Biofuels-Certification-System-Unveiled.aspx

Magdoff, F. (2008). Economics & ecology of biofuels. *Monthly Review (60)*3, 34-50.

Martin, P. Y. (2004). Gender as social institution. *Social Forces 82*(4), 1249-1273. doi: 10.1177/0891243204265269

Martínez, D. M. & Ebenhack, B. W. (2008). Understanding the role of energy consumption in human development through the use of saturation phenomena. *Energy Policy, 36*, 1430–1435.

Marx, K. (1978). Economic and philosophical manuscripts of 1844. In R. Tucker (Ed.) *The Marx-Engels reader second edition*. New York: Norton.

Marx, K. Grundrisse: Foundations of the critique of political economy. In R. Tucker 1978. *The Marx-Engels Reader Second Edition*. New York: Norton.

Marx, K. (1990). *Capital volume I*. B. Fowkes (Transl.) London: Penguin Classics.

Mathews, J.A. (2007). Biofuels: what a biopact between north and south could achieve. *Energy Policy, 35*, 3550-3570. doi: 10.1016/j.enpol.2007.02.011

Maunati, Y. (2005, February). *Sharing the fruit of forestry products: Indigenous people and their incomes in the forestry sector in East Kalimantan, Indonesia.* (Paper No. 24). Asian Development Bank. Retrieved from: www.adbi.org/files/2005.02.dp24.forestry.sector.indonesia.pdf

McCall, L. (2005). The complexity of intersectionality. *Signs, 30*(3): 1771-1800.

McDougall, G. (2011, January). *Report of the independent expert on minority issues: Mission to Colombia* (A/HRC/16/45/Add.1). Presented to Sixteenth Session of the Human Right Council, General Assembly of the United Nations,

McGahey, D.J. (2008, 31 October). *Bioenergy and pastoralism*. UK: SOS Sahel. Available from: www.globalbioenergy.org (Accessed 27 January 2011).

McMichael, P. (2009). The agrofuels project at large. *Critical Sociology. 5*(6): 825-839.

McMichael, P. (2010). Agrofuels in the food regime. *The Journal of Peasant Studies, 37*(4): 609-629.

Merchant, C. (1995). *Earthcare: Women and the environment.* New York: Routledge.

Mendonça, M.L. (2009). The environmental and social consequences of "green capitalism" in Brazil. In R. Jonasse (Ed.), *Agrofuels in the Americas.* (pp. 65-77). Oakland, CA: Institute for Food and Development Policy.

Mies, M. & Shiva, V. (1993). *Ecofeminism*. New Jersey: Zed Books.

Mingorance, F. (2006, November). *The flow of palm oil Colombia- Belgium/Europe: A study from a human rights perspective.* Brussels: HREV for the Coordination Belge pour la Colombie (CBC).

Milieudefensie & Friends of the Earth Europe. (2010, March). I. Maher, I. (Ed.). *Too green to be true: IOI corporations in Ketapang district, West Kalimantan.* Amsterdam: Friends of the Earth Netherlands (Milieudefensie).

Mistry, J., Berardi, A., Andrade, A., Krahô, T., Krahô, P. & Leonardos, O. (2005). Indigenous fire management in the cerrado of Brazil: The case of the Krahô of Tocantíıns. *Human Ecology, 33*(3), 365-386. doi: 10.1007/s10745-005-4143-8

Momsen, J.H. (2007). *Geography Compass, 1*(2), 149–162. doi: 10.1111/j.1749-8198.2007.00011.x

Mousseau, F. & Mittal, A. (Eds.). (2011). *Understanding land investment deals in Africa* (Country Report: Mozambique). Oakland, CA: The Oakland Institute.

Moore, J. (2011). Transcending the metabolic rift: A theory of crises in the capitalist world-ecology. *The Journal of Peasant Studies. 38*(1): 107-146. doi: 10.1080/03066150.2010.538579

Mouawad, J. (2008, April 20). Barreling along: The big thirst. *The New York Times*. Retrieved from: http://www.nytimes.com/2008/04/20/weekinreview/20mouawad.html?pagewanted=print

Muldera, V., Heri, V. & Wickham, T. (2009). Traditional honey and wax collection from *Apis dorsata* in West Kalimantan, Indonesia. In N. Bradbear (Ed.), *Bees and their role in forest livelihoods: A guide to the services provided by bees and the sustainable harvesting, processing and marketing of their products.* Rome: UNFAO.

Mulyoutami, E., Rismawan, R. & Joshi, L. (2009). Local knowledge and management of *simpukng* (forest gardens) among the Dayak people in East Kalimantan, Indonesia. *Forest Ecology and Management, 257*(10), 2054-2061.

Murrillo-Urrutia, L. G. (2007). Contemporary challenges in Colombia: An Afro-Colombian perspective. *The Journal of Pan African Studies, 1*(8), 135-142.

Nanda, M. (1997). History is what hurts. In R. Hennessey, & C. Ingraham (Eds.), *Materialist feminism: A reader in class, difference, and women's lives* (pp. 364-394). New York: Routledge.

Newport, F. (2008, April 4). Wives still do laundry, men do yard work. *Gallop Inc.* Retrieved from: http://www.gallup.com/poll/106249/wives-still-laundry-men-yard-work.aspx

Nhantumbo, I. & Salomão, A. (2010). *Biofuels, land access and rural livelihoods in Mozambique* (No. 12563IIED). London: International Institute for Environmental Development. Retrieved from: pubs.iied.org/pubs/pdfs/12563IIED.pdf

Norfolk, S. & Tanner, C. (2007). *Improving tenure security for the rural poor: Mozambique – country case study* (LEP Working Paper # 5). Rome: FAO.

Nyari, B. (2008). Biofuel land grabbing in Northern Ghana. Retrieved from: www.biofuelwatch.org.uk/docs/biofuels_ghana.pdf

Odeny, E., Leonhard, R., Borras Jr., S. & Rocha, M. (Eds.) (2010). *Land grabbing in Kenya and Mozambique: A report on two research missions – and a human rights analysis of land grabbing.*. Heidelberg, Germany: FIAN International FoodFirst Information and Action Network.

Oiye, S., Simel, J. O., Oniang'o, R. & Johns, T. (2009). The Maasai food system and food and nutrition security. In H. V. Kuhnlein, B. Erasmus & D. Spigelski (Eds.), *Indigenous peoples' food systems: The many dimensions of culture, diversity and environment for nutrition and health* (pp. 231-250). Rome: UNFAO.

Orth, M. (2007, August). *Subsistence foods to export goods: The impact of an oil palm plantation on local food sovereignty. North Barito, Central Kalimantan, Indonesia*. Retrieved from: www.biofuelwatch.org.uk/docs/foodsovereigntyindonesia.pdf

Otero, G. and Jones, H. (2010, October 9) *Petrodependency, biofuels and metabolic rift: a socio-ecological critique of agrofuels.* Paper presented to the 2010 Congress of the Latin American Studies Association, Toronto, Canada.

PCN & AFRODES USA. (2010, November 22 – December 3). *Joint Report to the UN Universal Periodic Review.* Presented by Proceso de Comunidades Negras –PCN & AFRODES USA to the Ninth Session of the UPR Working Group of the Human Rights Council, United States.

Pahl, G. (2005). *Biodiesel: growing a new energy economy*. White River Junction, VT: Chelsea Green.

Pellow, D. N. (2007). *Resisting global toxics: Transnational movements for environmental justice.* Cambridge: MIT Press.

Penan Support Group, Asian Forum for Human Rights, Development (FORUM-ASIA), & Asian Indigenous Women's Network (AIWN). (2010). *A wider context of sexual exploitation of Penan women and girls in Middle and Ulu Baram, Sarawak, Malaysia*. Selangor, Malaysia: SUARAM Kommunikasi

Pye, O. (2010). The biofuel connection – transnational activism and the palm oil boom, *The Journal of Peasant Studies, 37*(4), 851-874. doi: http://dx.doi.org/10.1080/03066150.2010.512461

Razavi, S. (2009). Engendering the political economy of agrarian change. *The Journal of Peasant Studies, 36*(1), 197-226.

Rey, G. H. (2009, August 1). Displaced women build new lives, brick by brick. *Inter Press News Service.* Retrieved from: http://ipsnews.net/news.asp?idnews=34194

Reyes, L. S. (2007, December 10). Biofuels gain, but food farms, forests lose. *Inquirer.net.* Retrieved from: http://newsinfo.inquirer.net/inquirerheadlines/nation/view/20071210-106052/Biofuels_gain,_but_food_farms,_forests_lose

Ridgeway, C. L. & Correll, S.J. (2004). Unpacking the gender system: A theoretical perspective on gender beliefs and social relations. *Gender and Society, 18*(4), 510-531. doi: 10.1177/0891243204265269

Ridgeway, C. L. (2009). Framed before we know it: How gender shapes social relations. *Gender and Society, 23*(4), 145-160. doi: 10.1177/0891243208330313

Risman, B. (2004). Gender as a social structure: Theory wrestling with activism. *Gender and Society, 18*(4), 429-450. doi: 10/1177/0891243204265349

Rocheleau, D, Thomas-Slayter, B. and Wangari, E. (1996). *Feminist political ecology: Global issues and local experiences.* New York: Routledge.

Rodrigues, E. & Carlini, E. A. (2005). Ritual use of plants with possible action on the central nervous system by the Krahô indians, Brazil. *Phytotherapy Research, 19,* 129-135. doi: 10.1002/ptr.1636

Rodrigues, E. (2007). Plants of restricted use indicated by three cultures in Brazil (Caboclo-river dweller, indian and quilombola). *Journal of Ethnopharmacology, 111,* 295-302. doi:10.1016/j.jep.2006.11.017

Rossi, A. & Lambrou, Y. (2008). *Gender and Equity Issues in Liquid Biofuels Production: Minimizing the Risks to Maximize the Opportunities*. Rome: United Nations Food and Agriculture Organization.

Rothkopf, G. (2009). *A blueprint for green energy in the Americas 2009.* Washington: Inter-American Development Bank.

Roy, J. and Crow, B. (2004, March 23). *Gender relations and access to water: What we want to know about social relations and women's time allocation.* Santa Cruz: Center for Global, International and Regional Studies, UC Santa Cruz. Retrieved from: http://escholarship.org/uc/item/0m5033gv

Rughani, D. (2009, February). *Profit at any cost: A battle between big business and sustainable lifestyles.* Biofuelwatch. Retrieved from: http://www.biofuelwatch.org.uk/files/biofuels_ghana.pdf

Salleh, A. (1997). *Ecofeminism: Nature, Marx and the postmodern.* New Jersey: Zed Books.

Salleh, A. (2001). Sustaining Marx or sustaining nature? An ecofeminist response to Foster and Burkett. *Organization and Environment, 14* (4), 443-450.

Salleh, A. (2010). From metabolic rift to "metabolic value": Reflections on environmental sociology and the alternative globalization movement. *Organization and Environment, 23*(2), 205-219.

Schoneveld, G. C., German, L. A. and Nutakor, E. (2010, April 26-27). *Towards sustainable biofuel development: Asessing local impacts of large-scale foreign land acquisitions in Ghana.* Paper presented at the World Bank Land Governance. Retrieved from: siteresources.worldbank.org/EXTARD/Resources/.../schoneveld.pdf

Schott, C. (2009, December). *Socio-economic dynamics of biofuel development in Asia Pacific.* Jakarta: Friedrich Ebert Stiftung.

Schroeder, R. (1999). *Shady practices: Agroforestry and gender politics in the Gambia*. Berkeley: University of California Press.

Seelke, C. R. (2010, July 13). Trafficking in persons in Latin American and the Caribbean. (No. RL33200). Prepared for Members and Committees of Congress. Washington: US Congressional Research Service.

Sequential-Pacific Biofuels Website. (2012) Available from Sequential-Pacific Biofuels website: http://www.sqbiofuels.com/production

Shao, M. (2002). *Parkia biglobosa: Changes in resource allocation in Kandiga, Ghana* (Unpublished master's thesis). Michigan Technological University: Houghton, Michigan.

Shattuck, A. (2009). Will sustainability certifications work? A look at the Roundtable on Sustainable Biofuels. In R. Jonasse (Ed.), *Agrofuels in the Americas* (pp. 89-101). Oakland, CA: Institute for Food and Development Policy.

Shiva, V. 2007. *Earth Democracy: Justice, Sustainability, and Peace*. New York: The New Press.

Simpson, S. (2006, September 25), Get ready for oil supplies to dwindle, experts warn. *The Vancouver Sun*. Retrieved from: http://www.canada.com/vancouversun/story.html?id=58fc9401-92d8-47b8-b1f2-bb320676825b&p=2 (Accessed 18 April 2012).

Sirait, M. T. (2009, May). *Indigenous peoples and oil palm plantation expansion in West Kalimantan, Idonesia*. The Hague: University of Amsterdam Law and Faculty.

Smolker, R., Tokar, B., Petermann, A., Hernandez, E. (2009, Summer). Devastated lands, displaced peoples: Agrofuel costs in Indonesia, Malaysia, Papua New Guinea. *Pacific Ecologist,17,* 36-39.

Sorda, G., Banse, M. & Kemfert, C. (2010). An overview of biofuel policies across the world. *Energy Policy, 38,* 6977-6988. doi: 10.1016/j.enpol.2010.06.066

Stiles, G. (2010, April 29). Oregon still a role player in biodiesel production. *Mail Tribune.* Retrieved from: http://www.mailtribune.com/apps/pbcs.dll/article?AID=/20100429/BIZ/4290309

Sturgeon, N. (1997). *Ecofeminist natures: Race, gender, feminist theory and political action*. New York: Routledge.

Suárez, S. M., Bickel, U., Garbers, F., Goldfarb, L., & Schneider, V. (2008, July). *Agrofuels in Brazil: Report of the fact-finding mission on the impacts of public policies encouraging the production of agrofuels on the environment of the human rights to food, work and the environment among the peasant and indigenous communities and rural workers in Brazil.* Heidelberg: FIAN.

Sukot, S. (2010, 10 April). Downplaying defects in state-systems and overemphasizing customary land tenure conversion for development in Papua New Guinea. In AidWatch (Ed.), *In defence of Melanesian customary land* (pp. 5-10). Australia: AidWatch. Retrieved from: www.aidwatch.org.au/sites/aidwatch.org.au/.../Steven%20Sukot.pdf

Sunderlin,W. D., Angelsen, A., Belcher, B., Burgers, P., Nasi, R., Santoso, L., & Wunder, S. (2005). Livelihoods, forests, and conservation in developing countries: An overview. *World Development Vol. 33*(9), 1383–1402. doi:10.1016/j.worlddev.2004.10.004

Survival International. (2010). *Violations of the rights of the Guarani of Mato Grosso do Sul State, Brazil: A Survival International report to the UN Committee on the Elimination of Racial Discrimination (UN CERD).* London: Survival International.

Sustainable Biodiesel Alliance (SBA). (2012). Available from: http://sustainablebiodieselalliance.com/dev/about.shtml

Tandon, N. (2009). The bio-fuel frenzy: what options for rural women? A case of rural development schizophrenia." *Gender and Development*, *17*(1), 109-124.

Tauli-Corpuz,V. & Tamang, P. (2007, May 7). *Oil Palm and Other Commercial Tree Plantations, Monocropping: Impacts on Indigenous Peoples' Land Tenure and Resource Management Systems and Livelihoods.* (E/C.19/2007/CRP.6) Presented to the United Nations Permanent Forum on Indigenous Issues, New York.

Taylor, P.L. (2006, August). *Country case study: Forest tenure and poverty in Colombia.* Fort Collins: Colorado State University.

Tenenbaum, D. J. 2008. Food vs. fuel: Diversion of crops could cause more hunger. *Environmental Health Perspectives*, *116*(6), A254 – A257. Retrieved from: http://ehp03.niehs.nih.gov/article/info%3Adoi%2F10.1289%2Fehp.116-a254

Tomenson, J.A. & Matthews, G.A. (2009). Causes and types of health effects during the use of crop protection chemicals: data from a survey of over 6,300 smallholder applicators in 24 different countries. *International Archives of Occupational Environmental Health*, *82*(8), 935-949. doi: 10.1007/s00420-009-0399-4

Torres, I. V. (2008, September). *African oil palm production in Colombia.* In A. Bebb, R. Bhambral, P. de Clerck, H. Burley (Eds.), *Fuelling destruction in Latin America: The real price of the drive for agrofuels* (pp. 29-36). Brussels: Friends Of the Earth Europe.

Tsikata, D. & P. Golah (Eds.) (2010). *Land tenure, gender and globalisation: Research and analysis from Africa, Asia and Latin America.* Ottawa: International Development and Research Centre.

Tsikata, D. & Yaro, J. (2011, April 6-8). *Land market liberalization and trans-national commercial land deals in Ghana since the 1990's.* Paper presented at the International Conference on Global Land Grabbing organized by the Land Deals Politics Initiative and the Journal of Peasant Studies, University of Sussex, England.

Turner, N. J., Łuczaj,Ł. J., Migliorini, P., Pieroni, A., Dreon, A. L., Sacchetti, L. E. & Paoletti, M. G. (2011). Edible and tended wild plants, traditional ecological knowledge and agroecology, *Critical Reviews in Plant Sciences, 30*(1-2), 198-225. doi:10.1080/07352689.2011.554492

The Royal Society. (2008, January). *Sustainable biofuels: prospects and challenges*. (Policy Document 01/08). Retrieved from: royalsociety.org/WorkArea/DownloadAsset.aspx?id=5501

UK Renewable Fuels Agency. (2008, July). *The Gallagher review of the indirect effects of biofuels production.* Retrieved from: http://www.renewablefuelsagency.gov.uk/search/node/gallagher

US Environmental Protection Agency. (2012). *Great lakes factsheet no. 1.* Retrieved from: http://www.epa.gov/glnpo/atlas/gl-fact1.html.

Van de Velde, L., Verbeke, W., Popp, M., Van Huylenbroeck, G. (2010). *Energy Policy, 38*: 5541–5549. doi:10.1016/j.enpol.2010.04.053

Vía Campesina (2012). La via campesina and the international women's day. Retrieved from *La Via Campesina* website: http://viacampesina.org/en/index.php?option=com_content&view=article&id=1219:la-via-campesina-and-the-international-womens day&catid=20:women&Itemid=39

Vermeulen, S. & Cotula, L. (2010). Over the heads of local people: Consultation, consent, and recompense in large-scale land deals for biofuels projects in Africa. *The Journal of Peasant Studies,* 37(4), 899 – 916. doi: 10.1080/03066150.2010.512463

Vogel, L. (1983). *Marxism and the oppression of women: Toward a unitary theory.* New Jersey: Rutgers University Press.

Von Lossau, A., & Qingsong, L. (Eds.). (2011). *Sourcebook on Sustainable Agrobioidiversity Management*. People's Republic of China: Social Sciences Academic Press.

UNEP (2009). *Vital Forest Graphics*. (Job No: DEW/1032/NA). Nairobi: Division of Early Warning and Assessment of the U.N. Environment Programme.

U.S. Energy Information Administration (2010, July). *International energy outlook 2010* **(**DOE/EIA-0484). Retrieved from: www.eia.gov/oiaf/ieo/index.html

Wangui, E. E. (2008). Development interventions, changing livelihoods, and the making of female Maasai pastoralists. *Agriculture and Human Values 25*, 365-378. doi: 10.1007/s10460-007-9111-z

Warner, R. & Bauer, M. (2002, October). *Mama lus frut scheme: An assessment of poverty reduction.* (ACIAR Project ASEM/1999/084). Canberra Australia: Centre for International Economics.

Waring, M. (1988). *Counting for nothing: What men value and what women are worth*. Toronto: University of Toronto Press.

Warren, K. (2000). *Ecofeminist philosophy: A western perspective on what it is and why it matters*. Lanham, MD: Rowman & Littlefield.

White, B. & Dasgupta A. (2010). Agrofuels capitalism: a view from political economy. *Journal of Peasant Studies, 37*(4), 593-607.

Wesseling, C., van Wendel de Joode, B., Ruepert C., Leon C., Monge P., Hermosillo H., & Partanen.T .J., (2001). *Paraquat in developing countries, International Journal of Occupational and Environmental Health, 7(4): 275-286.*

Wilkinson, T. (2008, June 5). U.S. food policy under fire at summit. *Los Angeles Times*. Retrieved from: http://articles.latimes.com/2008/jun/05/world/fg-food5

Zoomers, A. (2010). Globalisation and the foreignisation of space: Seven processes driving the current global land grab. *The Journal of Peasant Studies, 37*(2), 429-447. doi:10.1080/03066151003595325