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# Scoping the Gender Issues in Liquid Biofuel Value Chains

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# 1. Introduction

The gender dimensions of biofuel development have been relatively neglected. Yet to achieve equitable and socially sustainable development requires an understanding of how women, men and social groups may be affected differently by biofuel innovations. Whole communities will be affected by biofuel developments, but the opportunities available and the significant risks and impacts involved are not experienced equally by women and men. This is because of the gender inequalities that prevail throughout the world. In fact, women and female-headed households will be disproportionately affected, because they usually have less decision-making power, and lack control over key livelihood resources and their situations could be made worse by gender-blind biofuel developments.

Field-based evidence is scarce for identifying best practice in biofuel gender mainstreaming, and this is perhaps unsurprising given the recent nature of the commercial biofuels boom and the catch-up that is required of development practitioners and policy-makers to understand and respond to the risks, impacts and opportunities involved. More in-depth field studies in Asia, Latin America and Africa are needed to provide evidence that will enable the formulation of detailed guidance on specific feedstocks in different contexts.

A huge range of journal articles and grey literature has been reviewed to produce this study and in the search for information on the gender dimensions of biofuels. This scoping study seeks to inform policy-makers and practitioners about the key issues of gender in biofuels schemes and value chains and to provide recommendations about what can be done by building on women's capabilities, to support their agency and collective action and thus to promote their empowerment for more equitable rural pathways.

## Box 1 Definitions

Biomass is a non-fossil material of biological origin, such as energy crops, agricultural and forestry wastes and by-products, manure or microbial biomass; Biofuel is a fuel produced directly or indirectly from biomass such as fuelwood, charcoal, bioethanol, biodiesel, biogas (methane), or biohydrogen, and; Bioenergy is energy derived from biofuels (FAO, 2008).

Different biofuels systems are emerging based on 'modern' technologies, as opposed to 'traditional' methods of household fuel use. Bioenergy can refer to any renewable fuel which is made from plant-derived organic matter (biomass), but most of the attention in recent years has been grabbed by large-scale liquid biofuels produced for transportation using modern conversion technologies. Liquid biofuels can actually be produced on different scales (small and medium as well as large-scale), in different value chains/business models for differing end-uses (e.g. improving local energy access not just for transportation). This paper covers all aspects of *modern* bioenergy rather than the traditional use of fuelwood (and dung, charcoal, crop residues) for household cooking and heating. The latter involves inefficient direct combustion, but is prevalent in many rural areas, especially in Sub-Saharan Africa

(UN-ENERGY, 2007). The associated burden on women of the reliance on traditional biofuel, in terms of workloads and negative health impacts from indoor pollution, has been a focus of attention in development for many years. The potential and limitations of fuel efficient stoves and tree planting as responses have also been widely discussed and evaluated and so this paper focuses instead on newer technologies and value chain models for which the gender dimensions have been less well analysed. This is not to say that action is not needed in relation to fuelwood stoves and tree planting and it is possible that new concerns about climate change and ecosystem resilience and new sources of climate financing, could help to re-energise action in this arena.

## Box 2 Action needed on the traditional use of fuelwood

More support is needed to tackle energy poverty by improving women's access to energy for household and livelihood activities. Drudgery and pollution can be reduced by fuel-efficient stoves, but only where women have sufficient control of income to purchase stoves and stoves are appropriately designed. But caution is also needed because some technologies can increase women's workloads. In Kenya switching to biogas for cooking and lighting by women has been slow because it increases women's workloads (Muchiri, 2008). National energy policies rarely give much attention to gender issues. Where they do, as in Kenya, there is still an overall emphasis on commercial development of bioethanol and biodiesel. (Muchiri, 2008).

# 2. Understanding biofuel systems and gender impacts

The biofuels boom of recent years (i.e. the rapid increase in proposals and investment in commercial liquid biofuels for transportation) has been driven by the policies of developed countries. They have introduced subsidies and mandates to expand liquid biofuel use in transportation in their own countries in response to volatile energy prices, energy security challenges, and climate change mitigation imperatives.

Biofuel represents opportunities for developing nations to improve their own energy security, to contribute to GDP, and potentially to drive rural development through employment, enterprise development, raising incomes and increasing rural access to energy. But serious concerns have also been raised about large-scale commercial schemes based on liquid biofuels for transportation, and these concerns have drowned out the development potential of smaller scale developments and outgrower schemes. There is a lack of empirical evidence on the actual impacts of biofuel innovations and so existing analyses are necessarily speculative, with extrapolation of potential impacts from previous experience (e.g. on the social and environmental impacts of tree cash cropping, sugar cane and oil palm plantations research, contract farming, smallholder agriculture, participatory rural development and gender).

The policies of many producer countries have not as yet kept pace with new investment leading to a policy vacuum. Many developing country policies prioritise large commercially

oriented biofuel production involving transfers of land from villages to companies. In Kenya governmental policy recognises the role of women as household energy providers, for example, but focuses on commercial development of bioethanol and biodiesel (Muchiri, 2008). Consideration of gender issues is negligible within existing policy processes – but this does open up opportunities for advocacy on gender in newly opening biofuel policy spaces. In Tanzania, the government has placed a moratorium on new allocations of land to large biofuel developments until its policy is finalised and recent national guidelines are being shaped by field experiences (Sulle and Nelson, 2009) – thus, there is an opportunity to lobby for women’s participation and empowerment.

A biofuel system covers various elements including different feedstocks and conversion technologies, different stages of the value chain (e.g. production, milling, refining, distribution, end use), different business models in which the roles, rights and revenues of different actors and end uses of the energy vary, and are implemented in different contexts (agro-ecological conditions, policy contexts, patterns of land ownership, resource rights and access to education and jobs at the local level, gender relations, strength of civil society etc). The impact of a biofuel development will therefore be shaped by these factors. Environmental and social risks vary across different regions of the world (see Box 3 below) and appropriate feedstock choices and locations for biofuel production facilities are thus dependent on specific contexts and policy goals.

**Box 3** Regional concerns, opportunities and policy priorities

- **Sub-Saharan Africa:** Interest in land acquisition for liquid biofuel and solid biomass fuel production is significant. Policy priorities should be: evaluating potential impacts and planning appropriate responses; following up on work on fuel efficient stoves and fuelwood plantations; prioritisation of biofuel systems that do not create water conflicts.
- **East Asia and Pacific:** Converting forests into biofuel plantations is a major concern. Policy priorities are to identify ways to produce biofuels without clearing natural forests and peatlands, to avoid land use conflicts and use biomass wastes for bioenergy.
- **Latin America and Caribbean:** Likely to be a principal global net exporter of liquid biofuels and biofuel feedstocks, but expansion relies on crop price premiums paid by countries with biofuel mandates, but uncertainties are currently still too high for many developers to invest based on export markets and politically determined price premiums. Sustainability criteria could help avoid deforestation. Greater engagement of smallholders is needed.
- **South Asia:** Biofuel expansion often targeted on degraded land that is already in use, creating land-use conflicts, requiring land-use assessments to identify appropriate sites. Crops planted on drylands should not rely upon irrigation to increase yields as this can deplete resources and create conflicts amongst water users.

Source: Cushion et al (2010) *The World Bank*

The impacts of biofuel projects are shaped by prevailing gender relations and inequalities in society, in policy-making, in organisational cultures, (e.g. government departments, biofuel taskforces, private sector organisations and NGOs), in negotiations along the value chain and in community and household relations – as well as by the characteristics of the scheme or innovation itself (e.g. in terms of scale, underlying objectives, power and roles in the value chain model etc) (see Box 4 below).

**Box 4** Gender issues in biofuels at the local level

- How far does a new biofuel schemes change current gender relations and roles and what the outcomes will be especially for the most disadvantaged women and men?
- What are land use patterns and natural resource rights for women and men in the proposed area (not only land, but also trees, edible wild plants, fodder, medicinal plants, fuelwood, water)?
- What are commonly perceived traditional gender roles (e.g. in subsistence and domestic tasks, subsistence and cash crop agricultural production, trade, community and social activities)?
- How do overall daily workloads differ for (different groups of) women and men across the seasonal calendar?
- Do women and men have an equal say in household and community level decision-making? How does this vary between different kinds of households (e.g. female-headed households, migrant worker households, better off households, households with many young children or elderly members, etc)?
- Who controls household income for different types of expenditure? Is there any negotiation between spouses, particularly over income earned by women, for example, from biofuel activities?
- Who is at risk of resource dispossession from the proposed development?
- Who is involved in negotiations for land transfers and compensation agreements?
- What barriers do female smallholders face compared to men to participate? (e.g. relative access to financial resources such as credit, savings; agricultural inputs such as biofuel feedstock seeds, organic and conventional fertilisers, pesticides, etc; transportation; education; health facilities).

Four main types of biofuel scheme can be identified:

- a) **Large-scale commercial plantations and processing facilities:** Plantation production of feedstock and large-scale processing activities are being driven largely by export motives or securing domestic energy supply. Large companies or government are often involved as investors and local people are involved as employees primarily on the plantations or occasionally in processing plants.
- b) **Contract farming and outgrower schemes:** Such schemes involve smallholders at the production stage. Large schemes are being established based on many smallholder farmer suppliers (sometimes linked to plantation development and large processing facilities). The farmers own their own land and are brought into biofuels as contract farmers/outgrowers by companies seeking more secure supplies and offering technical assistance or access to inputs.
- c) **Smallholder involvement in value chain beyond production:** There are also other ways in which smallholders can be involved in the value chain. As well as contract farming at the production level, there are joint ventures (having a share in the business). At milling stages of the value chain smallholders could be engaged in co-operative mills, share ownership, small-scale mills for local use, supply contracts. Smallholders can also be involved in transportation and marketing roles.
- d) **Decentralised, village-based schemes in which there is local land ownership:** Smallholder farmers and rural groups, especially women's groups, are being supported to establish and run small-scale technologies to generate clean energy for local use and to support income-generating activities. These decentralised projects can be run on quite a large scale in terms of numbers of participants.

Combinations of the above are also possible, for example, with large-scale commercial plantations and processing facilities being linked to contract farming and outgrower schemes.

As a way of visually explaining the gender issues in the different biofuel value chain models, Diagram 2 shows the four types of scheme that can be distinguished and summarises how prevailing power and gender dynamics constrain rural women's participation in policy-making, limits attention to gender issues in policy-making and can create gender-differentiated impacts at the local level. Each type of scheme has differing types of socio-economic and environmental risks, opportunities and impacts – which are differentiated along gender lines.

### 3. Gender and large-scale, commercial biofuels

#### 3.1 The gender dimensions of large-scale developments

Commercial interest in liquid biofuels for transportation has driven the international biofuel boom, and despite the economic downturn, interest remains fairly high from investors. The opportunities for generating foreign investment, contributing to GDP and for possible job creation and energy access in rural areas are important considerations for developing countries. However, the extent to which these benefits will trickle down to rural areas may be variable. In Tanzania despite large-scale growth in mining over 20 years there has not been much increase in incomes in neighbouring communities or a significant contribution to the national treasury. Dispossession and enhanced land use conflicts can be the result and this is a caution for biofuel development particularly in the coastal areas where many are planned (Sulle and Nelson, 2009).

Many concerns have been raised about the potential negative social and environmental impacts of large-scale liquid biofuels for transportation, particularly where large land transfers are involved, because of the undervaluation of community lands, and indirect impacts such as deforestation and threats to food security. Large-scale schemes create a whole range of environmental and social risks, both direct and indirect (e.g. loss of biodiversity, depletion of natural resources, resource dispossession) (Rossi and Lambrou, 2008). Because of gender differentiation in access to and control of natural resources and livelihood assets many rural women are likely to have fewer resources to cope with the negative impacts and are more at risk of dispossession, because of weaker resource tenure security. Assumptions are commonly made that some areas of land are 'idle' because they may not be cultivated. Yet rural households, especially women who often have traditional household subsistence responsibilities, may rely on these resources to secure their livelihoods. In many locations, climate change is thought likely to increase pressure on ecosystem services and may further undermine resource access and food security.

Deforestation is one of the most important environmental risks associated with palm oil developments in Asia, for example, with significant numbers of reports of indigenous and rural communities being seriously affected, often involving violence and dispossession of rural community lands and natural resources (Tandon, 2009; Schott, 2009). Women and female-headed households are often disproportionately affected by deforestation, because of their weaker access to and control of key livelihood resources and their traditional gender roles in collecting wild edible plants, medicinal plants and fuelwood from the forest. At the moment large areas of South East Asia are being planted with *Jatropha Curcas* to produce biodiesel. An estimated five million hectares will have been planted worldwide by 2010, according to Schott (2009) with over 85% of this in Asia. However, if this crop is planted on fertile lands to increase yields the impacts may be more negative than is often expected compared to the more marginal lands which they are known for surviving in and which is

the reason for the attention is has received (Schott, 2009). Large-scale developments may also affect the livestock sector (e.g. by reducing access to fodder) and in some places men are traditionally responsible for the care of large ruminants and are thus likely to be disproportionately affected, but more studies are required of the gender dynamics relating to biofuels, livestock and livelihoods.

Large-scale transfers of village lands to general lands are often proposed as part of a large commercial biofuel development and these are likely to be linked to problems relating to equity, transparency, distribution of costs and benefits, increased conflicts and sometimes loss of customary land rights without compensation (e.g. when financing is not forthcoming for deals based on village lands being transferred to companies that then use them as collateral) (Sulle and Nelson, 2009, p63). Whole communities will be affected, and there may be occasions when men lose out, but women tend to have limited decision-making power at community level. In Tanzania existing biofuel guidelines say that land should only be leased for 25 years for biofuel projects, but they do not adequately guide calculation of compensation for village lands or prevent land reverting to government control after the end of biofuel leases rather than reverting to customary land. While the government guidelines say that investors should not approach local communities directly to access their land, it is more appropriate to build local community capacity to be able to better negotiate rather than being pushed aside (Sulle and Nelson, 2009). Women's land tenure security and ability to participate in negotiations with investors is usually weaker than that of men. Efforts are thus needed to support women's ability to participate in negotiations at community level and with investors so their interests and priorities are heard.

The use of independent facilitation is often promoted as means of levelling the playing field between less powerful local communities and much more powerful corporate investors, with villagers being advised on their land and resource legal rights and documentation etc. However, reliance on district officials for land allocations rather than direct negotiation between companies and investors is not always straightforward. In Tanzania large areas of land were transferred to Bioshape, an investor, from four communities in Kilda district. The compensation negotiations were facilitated by district officials, but most of the compensation payments have been captured by the district as a revenue stream, whereas villagers have lost their rights to the land and its resources (Sulle and Nelson, 2009). The authors note that conflicts of interest, information and power asymmetries and inequitable compensation are likely to be an inherent part of such land transfers, but evaluating the impacts will take many years. Compensation is unlikely to be fair because of the nature of land markets in rural Tanzania which prevent adequate valuation and because of low district capacity to support negotiations. Again, it is important that the rights and interests of women and marginalised groups are adequately represented in negotiations with appropriate facilitation and that less powerful groups are given appropriate support to participate in decision-making (Sulle and Nelson, 2009; Cotulla, 2010). More studies are required of the processes of negotiating compensation payments in biofuel schemes

and these studies should incorporate gender analysis to inform future compensation arrangements and contracting.

The implications of loss of customary land rights may not be fully understood either locally, by companies or by government. Less powerful and vocal groups are also less likely to have a say in the decision to allow land to be acquired for biofuel schemes. 'Where communities are offering over half their land to investors without any clear assurance of what they will receive in return, as in some Radii District villages, it would appear that local resource-allocation decisions have not been fully considered in terms of their implications on villagers' own livelihoods. It is evident that even with villages that have relinquished land to biofuel investors, as in some of the Kieserite District villages, community members may not know how much land has been given, and receive only verbal promises of benefits' (Sulle and Nelson, 2009, p61). It is thus essential that more effort is made to understand the value of village lands to local communities. This is particularly the case for the poorest sections of those communities and women who rely more than other households on natural resources for their livelihoods. Whilst this is not an issue which is relevant only to biofuel developments, but the rapidity of the biofuel boom and the absence of clear biofuel policies and regulation have complicated matters and it is critical that policy-makers support investment in rural areas but not at the expense of poor, rural communities and social groups. Sequencing of compensation payments requires scrutiny from NGOs and governmental parties as investors acquire land and natural resource rights and then only have to pay compensation after securing a bank loan – which does not always happen leaving the local communities in limbo (Sulle and Nelson, 2009). Biofuel policies should incorporate clear guidance to prevent local communities from having to shoulder the risk of losing their rights to land as investors acquire the land from government and then the biofuel scheme does not materialise because the investor cannot obtain the finances for implementation and as a result no compensation payments are made. In Mozambique, (Arndt, et al, undated) found that overall requests for land for production of sugarcane for ethanol and jatropha for biodiesel exceeded 20 million hectares by 2009. This represents the equivalent of two thirds of the total arable land and four times the land currently cultivated. However, they also found that many of these requests are attempts obtaining land rights where the state owns all the land. A quick search found fifteen on-going projects were identified that aim to plant 500,000 hectares (Arndt, et al, undated).

## Box 5 Comparing the impact of different production models on local land access in Tanzania

Differences exist between biofuel companies and their business models and hence their impacts on local land access.

- Some companies rely on contract and independent smallholder production for biofuel crop production (e.g. Diligent) and so have few immediate impacts on land access, although more subtle changes are possible on the longer-term. In effect this is an opportunity for agricultural diversification for rural communities, especially those on marginal lands, but this model may be less applicable where there are low population densities and low levels of local capacity for agricultural production.
- The large majority of active and prospective biofuel investors are seeking to acquire large areas of land – but still there are distinctions in type and size of land allocations. Smaller acquisitions, such as the acquisition by the company FELISA of land in Kigoma of 5,000 ha may have less impact on overall land access patterns for local communities, especially since the plantation based production of palm oil is being linked to an outgrower scheme. Other investors seek land that has already been classified as General Land, with granted or derivative rights of occupancy and not used extensively by local

communities may have fewer negative impacts on local communities and may bring production and employment opportunities.

- Where companies are seeking large areas of village land, scepticism about the relative costs and benefits of biofuel investments to the local population are most warranted – because of the inherent fundamental problems about land access. Where land is transferred from land belonging to villages to land that is classified as 'General Land' in Tanzania and leased to investors, customary rights are extinguished permanently over the natural resources in the village domain which forecloses on future development options for local communities and can have major short and long-term adverse impacts on local livelihoods. The full implications of such land transfers may not be understood by policy-makers, investors and communities themselves – informal resource use is poorly documented and understood by outsiders and removal of common property natural resources and livestock grazing land will have the most impact on vulnerable groups.

*Source: Sulle and Nelson, 2009*

Large biofuel developments can also exacerbate migration flows, which can also have mixed impacts on destination and origin locations and communities. Seasonal outmigration by men, for example to sugarcane plantations, can increase women's work at home. In South East Asia, Schott (2009) reports examples of communities being evicted from their lands in biofuel deals (largely palm oil related), and only in some cases can residents sell their land to investors. Even when the latter occurs, local people may be promised jobs on the plantations which fail to materialise or only extend to initial temporary jobs in forest clearance, for example, with positions on the established plantation then given to cheaper migrant workers who are also less likely to organise for collective action in defence of their land rights. This leaves local residents with lost livelihoods and lands, and no employment. Social tensions often arise between community elites attempting to profit from new deals, migrant workers, local farmers and community members including those without land and the plantation companies. According to Schott (2009) in many cases rural residents have to move to urban areas to seek work and end up in slums, although migration can also require access to some financial resources, social networks and information and may not be an option open to the poorest. There is limited analysis of the gender dimensions of these processes in South East Asia in Schott's study or elsewhere in the literature, but there is broader evidence from migration studies that women can be disproportionately affected because of the discrimination they face. Increased conflicts between local communities and migrant workers and in situations of community dispossession of land rights could also have gender dimensions, because women tend to have fewer resources to cope with such shocks and stresses. However, more studies are needed and it is clear that whole communities would suffer in such situations.

Job creation is important to support rural development, with potential multiplier benefits to the local economy, but there may be fewer jobs generated than is proposed in planning stages (Gordon, 2009; Clancy, 2008) and compared to subsistence agriculture (Holt-Gimenez, 2007 cited in Tandon 2009). Mechanization is also threatening existing jobs (Rossi and Lambrou, 2008; Clancy, 2008). Concerns about poor quality labour rights and conditions also exist (Gordon, 2009) and this would not be surprising given evidence about plantation agriculture beyond liquid biofuel for transportation schemes. Women are disadvantaged in labour markets because they face discrimination which leads to them having lesser access to skills and education. This means that they tend to be restricted to the informal economy or to the lowest paid positions with poor terms and conditions (Barrientos et al, 2003, Bolwig et al, 2008).

There is limited literature on working conditions on plantations that are part of biofuel value chains. A recent study by Schott (2009) does explore living and working conditions on plantations in South East Asia and finds that conditions are tough for plantation workers, landless farmers and smallholders wherever the biofuel scheme is part of larger distribution systems (i.e. biofuel export chains)<sup>1</sup>. Very low pay for endless working hours, job hazards to health and life without insurance nor safety measures, intimidation by violence and loss of livelihoods are only some of the usual consequences arising when big plantation companies enter a rural area' (Schott, 2009, p14). Because the plantations are located in remote rural areas they receive less international attention (compared to textile factories for example) and far from state enforcement of labour rights. Workers are ill-informed of their legal rights and fearful of attempting to organise (Schott, 2009). It is more difficult for farm labourers in remote locations

<sup>1</sup> Smallholders are often dependent on the supply and distribution systems of large companies or government agencies and becoming indebted when they cannot produce sufficient yields to pay for services they have used according to Schott, 2009.

and for disparate smallholders to organise or for unions to reach them compared to workers in factories, Schott's review finds that unions specifically for plantation workers are practically non-existent in the region, except possibly in Malaysia, and so workers that do manage to join a union are usually subsumed under more generic umbrella organisations. The study does not comment on how far the unions that do represent plantation workers have awareness of gender issues and adequately represent women workers, or provide data on number of women members.

The particularly difficult conditions for women workers are highlighted by Schott (2009): The working conditions are especially hard for women who are not only paid less and sometimes even sexually exploited, but who have to care for their households and children after work. They are given the "easier" jobs such as applying pesticides and fertilisers – which means splashing highly poisonous substances onto the soil without appropriate protection. These often cause long-term health problems (Schott, 2009, p15). "On those plantations, working time is not counted in hours. What counts, is the amount of the delivered yield", says Rulita of the Wood and Forestry Workers Union in Indonesia (DPP FSP Kahutindo). "If a worker doesn't bring in the required result, his wife and kids have to help no matter how so that he doesn't lose his job." (Schott, 2009, p17).

Various voluntary sustainability standards and certification schemes are emerging in response to the concerns about socio-environmental impacts. These standards often presented in the biofuel literature as one of the key measures to regulate biofuel production and assure buyers of sustainability. These standards also have support from many developed country governments with biofuel mandates. Examples of these include the Roundtable on Sustainable Palm Oil and the Roundtable on Sustainable Biofuels. However, the analysis of these sustainability standards is fairly uncritical, and there is limited evidence of the impact of such schemes – e.g. how far they are able to change practices to increase sustainability, particularly in relation to the indirect impacts of deforestation and food security. A recent Friends of the Earth report (2008) argues that there are inherent limitations in sustainability standards and that they act as a smokescreen, heralding sustainability, when in fact the most significant structural trends and impacts (e.g. land concentration, deforestation, etc) remain untouched.

In terms of labour standards for workers, sustainability standards can draw upon experiences in ethical sourcing of agrifoods, garments, textiles and the recent assessments of their effectiveness and impact (e.g. agrifood corporate code of impact assessments, Nelson, Martin and Ewert, 2006; ETI impact assessment, Barrientos and Smith, 2006) which found mixed results and reflect a widely regarded crisis in social auditing. In Kenyan cut flowers and South African wine, Nelson et al, 2006 found that whilst there was some progress on material wealth indicators, that there was less progress on empowerment indicators. Also many of the changes only benefit permanent workers, leaving temporary workers unaffected – and more women are found in temporary work usually than permanent work. Moreover, the standards are more of a means of maintaining market access with the costs borne by suppliers, rather than a mechanism by which retailers and suppliers share the costs

of labour standard transformation. For such standards to be effective requires workers to have adequate representation through unions and for a strong civil society voice supporting workers voices in negotiations and demanding improvements in labour standards. The issue of marginal lands should be tackled in all standards pertaining to biofuels, with a clear definition provided and requiring recognition of the potential value of such lands to local people (often in practice, poorer women).

The extent of changes in labour standards can be as driven by national legislative change and progressive management attitudes as anything else. Annex 1 includes a table analysing the gender coverage of different biofuel-related sustainability initiatives and standards.

Second-generation biofuels are likely to be based on technologies which use cellulose-containing plant material such as recycled waste oils, rice husks, wheat straw, wood chips or those using algae. However, these technologies are not yet commercially available and may not be for some time to come. Given the types of materials they use they are less likely to compete with food production and to have fewer negative environmental impacts. However, the socio-economic and gender impacts are as yet unknown. There are also questions about whether future market demand can soak up both first generation biofuel production, as well as new second-generation sources once they become available. If not, what will happen to the workers and smallholders who rely on first generation biofuel value chains and schemes? (Schott, 2009).

### **3.2 Increasing gender sensitivity and women's empowerment in large-scale biofuel schemes**

Generally speaking caution should be exercised where large scale proposals involve the transfer of large areas of land from village control because of the land access implications particularly for vulnerable groups, such as the rural poor of which women constitute a significant part. Clearly biofuel decision-making involves a number of trade-offs for policy-makers and planners – but it is important that the outcomes for the rural poor, especially women, are taken seriously (Sulle and Nelson, 2009).

Key steps for increasing gender sensitivity in such schemes where they are being implemented are:

#### **Research**

Learn more about the gender impacts of the transfer of large areas of land from customary to corporate control (e.g. What are existing patterns of land ownership and resource use and how do these vary along gender lines? What are the gender differentiated use rights of common property resources such as grazing rights, collection of fuelwood, wild edible plants, etc; How are livelihoods and resource access being affected along gender and diversity lines by the project?)

#### **Alternative models**

Ensure that biofuel policies take full account of alternative biofuel value chain models – rather than just the more common, but more contentious large-scale commercial developments based on land transfers. Compare different biofuel models to identify what their strengths and weaknesses are, including analysis of the gender and social

difference impacts. Share this information more widely with biofuel companies and where possible create financial mechanisms and support innovations to encourage uptake of *alternative* models which are more likely to empower women and avoid negative impacts upon them.

## **Evaluation**

In assessing a new large biofuel commercial investment proposal and in policy formulation, account should be taken of the true value of land (social, spiritual, livelihoods, ecosystem services and resilience to climate change) to local communities and over the long-term, not just short-term economic benefits which may not reach the poorest and most vulnerable. The national scale benefits of export revenues, energy security, and local economic development, has to also be weighed up against the quality of jobs and who has access to them, and the potential damage to food security, livelihoods and environments of the rural poor – especially women and female-headed households. Integrate gender criteria in the evaluation of new biofuel investor proposals (e.g. in socio-environmental impact assessment processes).

## **Consultations**

Support is needed so that women and female heads of household are able to participate in public consultations as well as men and male heads of household. This requires attention to: timings of meeting so that women are most likely to be able to attend: choosing appropriate languages and communication media (e.g. visual participatory methods, community radio, participatory video for communication); holding separate male and female discussions and skilled facilitation to enable women to speak up in meetings; targets for numbers of women attending meetings could be introduced and communicated to community leaders prior to meetings; receptivity is required amongst those conducting the consultations to hear the voices of women as well as men.

## **Compensation and resettlement payments**

Explore the gender dimensions of compensation and resettlement mechanisms (e.g. who is receiving compensation benefits, who has a say in compensation negotiations?) and identify steps that could be taken to ensure that resource allocation is more accountable, transparent and equitable, especially for women (e.g. training for community members including women; Support oversight from other stakeholders or government bodies beyond the district; Assess the pros and cons of independent facilitation versus local government mediation in relation to vulnerable groups sharing benefits and having a voice). Attention should also be paid to who in the household is given compensation payments and has control of the payments – otherwise there could be risks that women may be further marginalised as they rely on cash income through compensation payments to buy food and essentials, rather than having access to common property resources.

## **Community capacity building**

Build the capacity of women and disadvantaged groups to participate in community-investor consultations and provide adequate legal advice and information targeted to women (e.g. through legal caravans). Build up legal

literacy of women and disadvantaged groups to enable them to claim their land rights and obtain documentation of secure tenure. Ensure that compensation negotiations have independent facilitation, but where this role is taken on by local government guidelines need to ensure that the funds are not diverted in large part for district revenue streams.

## **Policy reforms**

Land policy reforms are needed to strengthen women's land tenure security (e.g. recognition of land rights of spouses). Biofuel policies should be informed by local experiences and evidence which should include the interests and priorities of local communities, particularly the most vulnerable or least powerful.

## **Awareness raising**

Raise awareness of the importance of tackling gender discrimination in rural planning and investment processes. Conduct gender audits of relevant bodies (e.g. energy departments or biofuel governmental bodies, land ministries and cadastral units), training, appoint gender champions, devise gender strategies and targets.

## **Access to employment**

Promote women's access to employment through education and skills training programmes and by tackling gender discrimination in the workplace. Set targets for recruitment of women on plantations and in factories to counter discrimination and require companies seeking new land areas for biofuel investments to develop gender policies with clear targets and strategies. NGOs can play a role here in capacity building activities, as can government in providing training programmes and education services.

## **Labour rights**

The government has to ensure that the national legal framework protects women worker's rights, supports decent working conditions and prevents discrimination in recruitment. Enforcement of national laws must also be a priority to protect worker's rights. Governments should promote women's labour rights. Ratify ILO labour standards and integrate gender issues in governmental regulation of biofuel, i.e. ensuring that laws regulating biofuel labour standards do not discriminate against women and provide a living wage. Learn from best practice in promoting decent work, particularly for women workers, in other global agricultural value chains and support alliances of women workers and civil society organisations to demand improvements in labour rights and to undertake collective action.

## **Assess sustainability standard impacts and recognise limitations**

More in-depth impact assessment of sustainability standards to identify if they can lead to improvements for women workers by changing on-site labour terms and conditions. Conduct research into women's and men's access to biofuel waged labour and the changing terms of inclusion. Identify particular areas of concern (e.g. health and safety issues particularly affecting women, child labour and childcare, lack of written contracts, sexual harassment, equal pay or permanent positions for women or promotion opportunities). It is also important to assess how effective the standards are in preventing on- and off-site negative

social, environmental and livelihood impacts in practice – without financial and capacity building incentives from buyers and more powerful actors further downstream. Developed country governments should take account of this evidence in reviewing their energy strategies and mandates.

### **Implementing sustainability standards**

Where large-scale schemes are being planned, include gender criteria in the voluntary standards by standard bodies and in government regulation. For example, ensure that women workers receive equal pay for equal work, have equal access to promotion, are free from discrimination and harassment, are free to organise, have access to childcare facilities etc. The development of national southern standards devised by multi-stakeholder initiatives and monitored through participatory social auditing can be a mechanism for involving key stakeholders (e.g. from NGOs, trade unions and the private sector), increasing local ownership of standards and achieving greater applicability to a particular context. However, value chain power relations will still play a role in shaping the room for manoeuvre of local actors. Governments can take a more active role in labour standards and environmental regulation to ensure minimum standards are in place but enforcement has been a weakness in the past and must improve. Recognition is needed of the limits of voluntary schemes in regulating the off-site impacts of large-scale developments, such as deforestation, and the gendered socio-economic impacts of such processes. New innovations in payments for ecosystem services and carbon sequestration may play a role in protecting forests and supporting local livelihoods, but impact assessment and gender analysis is required to see if sustainability standards themselves and financial incentives of payments for ecosystem services can tackle on and off site socio-environmental impacts.

### **Worker capacity building**

Provide space and support for civil society organisations active on labour rights issues, particularly women worker rights, and encourage them to consider labour rights issues and negotiations in biofuel developments.

### **Responding to climate change**

Appraisals of biofuel schemes should take into account climate science and local climate knowledge to assess sustainability in future years of the particular feedstock involved in future climatic conditions and taking into account the other inter-acting multiple stresses on rural communities that could change the balance of (gender-disaggregated) benefits, costs and impacts. The gender dimensions of climate change have been identified in the literature (for an annotated bibliography see Nelson, forthcoming).

## **4. Gender issues and outgrower schemes**

### **4.1 Gender dimensions of biofuel outgrower schemes**

There are different steps in the value chain in which smallholders could participate more fully. The most common role for smallholders in biofuel schemes that reach beyond local use is in biofuel production. Biofuel outgrower schemes are sometimes associated with larger scale plantations and processing plants with all their socio-environmental risks, but sometimes they are set up without this linkage. Outgrower schemes themselves do at least offer greater potential for smallholders to benefit from biofuel schemes that link to local, regional and international markets. Examples are found in the literature of smallholders being contracted by companies to grow sugar cane, palm oil and *Jatropha curcas* for use in biofuel which is then used elsewhere, often exported to other countries.

Smallholders face the similar barriers to participation in biofuel value chains as they do in other kinds of agricultural value chain (Rossi and Lambrou, 2009) and women smallholders and female-headed households face disproportionate obstacles to participation as they do in rural markets. In biofuels, as with other crops, they are likely to have lesser access to key inputs, and skills and are thus less likely to benefit compared to male counterparts. Gender discrimination means that women usually have lesser access to education, inputs (e.g. feedstock seeds) credit and technical advice - the latter being particularly important in relation to new biofuel cultivation and technologies, etc – and are sometimes under pressure within the household to concentrate on domestic and subsistence tasks. There is thus a critically important role for governments and civil society organisations, as well as the private sector, to support women's participation through targeted support (e.g. in credit programmes, agricultural extension, advocacy, land policy reforms, etc).

Farmers participating as contract farmers or outgrowers may benefit because they gain increased access to technical advice, credit and inputs from companies leading to possible higher yields, and increases in incomes. However, there are also challenges in relation to production and in the distribution of benefits and costs, participation by women and men in decision-making and benefit sharing and longer-term opportunities for empowerment beyond a relationship of dependency, etc.

**Table 1** Potential pros and cons of biofuel smallholder contract farming

Positive dimensions for companies and smallholders	Potential challenges for companies and smallholders	Particular gender issues
<p>Greater security of supply (more reliable production and quality) for companies. Companies get access to land (without having to acquire it in a land transfer) and political capital from working with smallholders rather than just plantation production.</p> <p>Smallholders gain increased access to technical advice, 'modern' technologies, inputs, credits, quality control, new markets and marketing support (Kudadjie-Freeman, 2008).</p> <p>This can lead to higher smallholder incomes, and potentially reduced price risk if prices are specified in advance (FAO, 2001 in Dubois, 2008).</p>	<p>Concerns that large companies take over land, water or seed supplies over time where successful projects emerge and where there is weak resource tenure security. This can affect local communities and undermine local biofuel initiatives.</p> <p>Risks of market failure.</p> <p>Where smallholders lose access to land, for whatever reason, this can also undermine the sustainability of company operations.</p> <p>Production problems of new crops. Farmers may not be able to meet a company's specifications because of climate variability (Banda, in Karlsson and Banda, 2009) or because of socio-cultural constraints. Indebtedness can arise in South East Asia palm oil schemes when yields are too low to enable farmers to pay for company services already used (e.g. in provision of seeds or fertilisers etc).</p> <p>Companies may manipulate quotas and fail to buy all contracted production when facing management or marketing problems and some companies may be unreliable or exploit their monopsony. Corruption in the allocation of quotas can occur (FAO, 2001 in Dubois, 2008).</p> <p>Lack of consultation and poor management can lead to discontent amongst farmers. Farmers may then sell to others thus undermining processing by the factory and inputs (supplied on company credit) may be diverted to other uses, affecting yields).</p> <p>Smallholders may not be given written contracts - they may be ambiguous. Communities may not be adequately consulted in the design of the project or in specific contracts.</p> <p>Increasingly stringent sustainability standards can exclude smallholder farmers.</p>	<p>Opportunities for women to benefit from participation in successful schemes. Some outgrower schemes target women's groups specifically.</p> <p>Women tend to experience weaker resource tenure security than men and so are more at risk of dispossession.</p> <p>Women usually have lesser influence in household/ community decision-making than men and may not be fully consulted in project designs and in the drawing up of contracts.</p> <p>Where there are production problems and market failures, it is possible that women have less material resources to fall back upon.</p> <p>Women farmers may not be given the same access to credit, technical advice, and inputs, etc as their male counterparts.</p>

Women are already benefiting from participation in such schemes and more research should be done to identify how female farmers can be supported further (e.g. in gender training for men and women, farmer field schools and community radio, etc). In Sri Lanka, a small-scale pilot project to support smallholders to supply jatropha to a large biodiesel production plant has been established. Commercial fuel crop production is being combined with local energy applications and a local NGO provides technical support and a local community organisation links farmers, external agencies and the processing company. Farmers are paid per plant they grow and maintain. Women are participating and benefiting because the project is focused on smallholders and the growing of jatropha in home gardens, although they are not the specific target (Wickramasinghe, in Karlsson and Banda, 2009). There is also evidence from contract farming in agri-food chains that women can benefit. For example in tomato growing in the Dominican Republic, contract farming has been successful and has increased demand for women's unpaid farm labour, but women are challenging this and claiming payment for their work (Raynolds, 2002).

However, traditional gender norms present significant barriers to women's participation in the design and implementation of such schemes, and to sharing equally in the benefits. In some cases smallholders are not the target and it is therefore extremely difficult for smallholders, especially female farmers, to participate. In Zimbabwe, a national jatropha project, managed by the National Oil company, is working through contracts mainly with large farmers who have the resources to participate. Smallholder farmers, including female farmers, are not given any support to participate and inequalities in the resource tenure systems constrain both women's and men's participation – but particularly that of women and female-headed households. Many smallholders lack access to tractors for use in tillage (Gandure, in Karlsson and Banda, 2009). Socio-cultural constraints exist which can limit the ability of smallholders to meet production targets set in contract farming and some of these are gender related. A non-biofuel value chain example: In Kericho, Kenya, a third of all tea plots in an outgrower scheme were neglected due to conflicts between husbands and wives (von D von Bülow and A. Sørensen, 1993).

Women farmers may also not have much say in how biofuel income is used, as with other cash crops, yet participation of the household in the scheme could increase their work burden and affect subsistence food production, with potential implications for food security. Although this shift could be offset through increased income security the issue is what influence different women in a household have in deciding on the use of that income. Previous experience with plantation crops, such as oil palm, and timber, provide insights into possible outcomes in contract farming in biofuels. Intercropping of young oil palms with food crops and mixed forest gardens in Indonesia has been shown to have positive environmental benefits and can improve food availability, but there are also negative effects for labour and aspects of food security (Vermeulen and Goad, 2006 cited by Dubois, 2008).

Over time there are also risks of resource dispossession by larger investors drawn to successful initiatives and suitable land and newly emerging sources of seed supplies. The contracts agreed between producers and smallholders are not always written down or may be ambiguous. Women are also less likely to be adequately involved in community consultations, or included in the design of these contracts. Compared to large-scale schemes where investors seek large areas of land and rights of occupancy over and above customary tenure, in contract farming or with independent smallholder suppliers there is no immediate undermining of local land access and tenure (Sulle and Nelson, 2009). However, over time increasing agricultural commercialisation and land values and more successful farmers taking advantage of new biofuel opportunities can lead to exacerbation of existing inequalities along lines of social differentiation (e.g. gender, age, income, status) (Sulle and Nelson, 2009). In Southeast Asia, Schott (2009) finds that smallholders may become indebted to large companies which provide them with services which they cannot then pay for when their palm oil yields are not sufficient. These farmers cannot produce enough of their own food and struggle to buy enough to cover household needs. The gender dimensions of these processes are not teased out in the report, but women commonly have less access to food in households in times of food shortages, eating fewer meals or taking smaller portions so that other household members have enough.

Outgrower schemes and contract farming can also have environmental impacts. The actions of many individual smallholders can cumulatively lead to large-scale environmental change in a landscape (Dubois, 2008). Where there is a shift from more agro-ecological methods of food farming to monoculture cropping for energy this presents environmental risks for local communities, with potential effects on ecosystem resilience. The risks are greatest for the poorest households and for marginalised groups including women, because of their reliance on climate-sensitive resources. Women are responsible usually for water collection for domestic purposes, for example, and this task may become harder to fulfil each day in areas of increasing water scarcity. Similarly other traditional roles in household subsistence which women tend to have responsibility for (gathering and growing food, obtaining fuel) will also be affected by the changing climate.

There is limited information on biofuel contract farming and outgrower schemes to date, and even less on the gender implications. A recent study (Arndt, et al, undated) models the different gender employment intensities in feedstock production and downstream processing in smallholder outgrower schemes, involving jatropha feedstock for biodiesel are investigated in a low income, land abundant country (Mozambique) and finds that there are positive opportunities for poverty reduction – particularly if female workers gain access to better education and policies support increases in agricultural productivity to avoid food shortages as cash cropping takes up labour (see Box 6 opposite).

**Box 6** Modelling of scenarios of gender employment intensity in biofuel expansion in Mozambique

Different gender employment intensities in feedstock production and downstream processing in smallholder outgrower schemes, involving jatropha feedstock for biodiesel are investigated in a recent study focusing on Mozambique. Different scenarios are modelled of the expansion of biofuels production and processing using a gendered dynamic computable general equilibrium or CGE model in Mozambique – a low income and land abundant African economy – to examine the macro and micro level implications.

Requests for land for the growing of sugarcane for ethanol and jatropha for biodiesel exceeded 20 million hectares by 2009, the equivalent of two thirds of the total arable land and four times the land currently cultivated. Although many requests are attempts obtaining land rights, fifteen on-going projects were identified that aim to plant 500,000 hectares. The modelling integrates a gender optic because biofuel growth implies cash/export crop production increases, in which men predominate and food crop production, in which women predominate, will be indirectly affected by resource competition and exchange rate effects that are likely to increase the relative attractiveness of imported foods. A fifth of the total population reside in female headed households, with the majority earning their income from female labour and relying on unskilled workers' earnings (i.e. there is a lack of higher skilled female labour). Levels of poverty and food consumption shares are significantly higher for female-headed households because they work more in lower-paying farm employment. A lack of skills, access to technology and resources present barriers to women moving into cash cropping.

Women, who are predominantly involved in subsistence agriculture, could gain from increased incomes through growing biofuels in outgrower schemes. Additional incomes generated could also have knock-on effects in reducing household vulnerability and poverty levels. But significant constraints exist – namely the need to increase years of schooling for unskilled female workers to gain from biofuels and other skill intensive agricultural jobs. The study concludes that biofuels investments represent a pathway for poverty reduction, but this depends partly on female workers having better education and there is a caveat: policy has to support increased agricultural productivity to make up for possible shortfalls in food production through increased technical assistance and other policy measures. This approach could enable Mozambique to both boost GDP, but also to produce locally grown crops for household consumption.

Source: Arndt, C., R. Benfica, and J.Thurlow (undated) 'Gender implications of biofuels expansion in Africa: The Case of Mozambique'. World Bank: Washington.

A recent study of contracting and farmer relationships, but not in biofuel schemes also provides important insights for biofuel situations. An analysis of sorghum production in Ghana (Kudadjie *et al*, 2009) identifies how technical and institutional problems can be avoided through improvements in coordination and engagement around technological issues between farmers and the processing company but also with scientists and NGOs (see Box 7 below).

**Box 7** Sorghum contract production in Ghana – key lessons relevant for biofuel schemes

- Stakeholders should come together to negotiate technological adaptations and support for active involvement of farmers is needed. Scientific knowledge should be applied to establish specific production problems that farmers may face in growing the crop. Objective interpretations of these production problems should be agreed and used as the basis for negotiating contractual terms. Contracts should help farmers to minimise their production risks and also help reduce the marketing risks for the company.
- The actual contents of a contract should be clear – risks and uncertainties should be included.
- Space must be created for negotiation between parties: For negotiation to be fair and open, growers and companies need to interact as partners, not as clients and patrons, especially where most growers are small-scale operators with little power.
- Capacity building support is needed to create strong, effective farmer organisations that can maintain a business link and relationship with companies. Support direct and open lines of communication between growers and the company.
- All stakeholders need to be committed to seeking a better application of resources, skills, knowledge. Incorporating technological improvements into the contracting process serves to make initially poor bargains better.

Source: Kudadjie *et al* (2009)

Lessons can also be learned from the Fairtrade system of contract farming. To facilitate smallholder participation in agricultural export trading where production, processing and marketing costs and complexities are high and to regulate the behaviour of producers and processors, the Fairtrade Labelling Organisation has developed a contract production (CP) standard. Smallholders enter contracts with companies that then undertake to support smallholder engagement. A recent evaluation of CP projects in South Asia found that some economic and environmental benefits have been achieved but more needs to be done on empowerment issues. In the Fairtrade model, the contracting companies are called 'promoting bodies' and they are responsible for building the capacity of smallholder producer organisations (PO) over time, with the eventual aim of the farmer organisation achieving independence. Some of the findings provide useful insights for improving biofuel contact schemes for all concerned (Sambrani and Ellman, 2009):

- Ensure that farmers and companies have adequate capacity and resources, that the scheme is economically viable and that production and marketing risks are manageable.
- The company should have a reputation for ethics and reliability.
- The capacity of farmer organisations to take on new roles and negotiate deals within the value chain is important.
- Independent facilitation is preferable, where this is available.
- A clear empowerment strategy should be set out from the start.
- Clear, codified roles are should be agreed in written contracts with appropriate incentives and sanctions.
- In Fairtrade a mechanism for establishing fair prices, ideally linked to end-market-price of the finished product is required.
- Effective support should be provided to growers for accessing inputs and support services, collecting and storing crops, monitoring and recording the activities of all parties to improve future performance.
- More substantive auditing with greater sensitivity to local conditions.

The gender dimensions are generally neglected in studies on contract farming, but ensuring women's participation in contract development and re-negotiations would clearly be a major step in the right direction. By ensuring agreements are based on scientific information about production risks, this might also help to overcome some of the barriers for women smallholders to participate and the risks that they would face. However, much will depend upon the organizational culture of the company or government bodies involved as to whether they take specific steps to promote women's empowerment or conduct gender analysis. NGOs and governments can play a role in encouraging more targeted support to female smallholders in outgrower schemes and to organisational capacity building for women's groups.

The Brazil 'Social Fuel Seal' is a governmental initiative which provides tax and financial incentives for biodiesel producers to buy feedstock from smallholders in disadvantaged regions. It is therefore a promising initiative to enable smallholders to participate in and benefit from biofuel production, but no systematic impact assessment has been found or information on the extent to which buyers are purchasing biofuels from female smallholders.

#### Box 8 The Brazil 'Social Fuel Seal'

- An initiative of the Brazilian Government and part of the National Program of Bio-diesel Production and Use (NPPB). Launched in 2005–06 it aims to extend biofuel production and its benefits beyond the large farms and companies that dominate the industry to smallholders. Feedstocks covered by the scheme include soy, castor seed, palm and sunflower.
- The scheme provides tax and other financial incentives for biodiesel producers to purchase feedstocks from smaller farms in poorer regions of the country. The seal is only awarded to national fuel producing companies (both state owned and private) who commit to purchasing a certain percentage of their feedstock from small producers, and to providing fair contracts and support to these farmers. Contracts between companies and farmers have to be negotiated with involvement of intermediaries (unions or farmer reps).
- By the end of 2007, 21 companies were signed up but estimates of participating smallholders range from 90,000 (local news) to 400,000 (FAO). The scheme is expanding rapidly, with state-owned oil company Petrobras investing heavily in bio-diesel - it opened three bio-diesel production plants in late 2008 and contracted 55,000 small-scale farmers to produce feedstock for these plants alone.
- Farming methods and environmental standards are not specified by the Social Seal, but the emphasis on smallholder farms (typically 1–4 hectares) may avoid some of the environmental risks of large-scale, monoculture plantations.

Some recent studies found that NPPB has been operating far below its capacity and the planned degree of feedstock diversity – more than 70% comes from soybean. They have highlighted important weaknesses in the programme, including (Wilkinson and Herrera, 2008; Amaral, 2008):

- High production costs which limit the market (current production only fulfils legislation).
- Uncertainties on the availability and price of feedstock (some such as castor oil, compete with the food and chemicals market).
- Need for improvement of production processes at industrial plants to meet national quality standards.
- Need for more structural measures to reinforce access to primary assets, fundamentally land, especially in some regions such as the North East.
- Insufficient provision of technical assistance regarding some feedstock such as castor oil and sunflower.

Various sources: [www.brasilecodiesel.com.br](http://www.brasilecodiesel.com.br); [www.biofuelreview.com/content/view/full/1664/1/](http://www.biofuelreview.com/content/view/full/1664/1/); <http://news.mongabay.com/bioenergy/2007/03/in-depth-look-at-brazils-social-fuel.html>

There are no explicit gender criteria in the Social Fuel Seal and it does not cover on-site issues such as environmental and workers' rights at farm level. No gender-disaggregated data was found on the composition of participating smallholders (in terms of female and male farmers). However, the Social Fuel Seal does provide a mechanism for smallholders to participate in biofuel production for export and it is possible that this mechanism could integrate incentives for producer companies to buy from women farmers. It is not clear if and how far the Social Fuel Seal can substitute smallholder buyers for large-scale monocrop plantations. If it has this effect it might prevent some of the off-site socio-economic and environmental risks associated with the latter which particularly disadvantage women. The (socially-differentiated) impacts of the Brazil Social Fuel Seal appear as yet to be un-assessed and more research might be fruitful to identify the potential to support women's empowerment in biofuel production.

## 4.2 Exploring approaches for increasing gender sensitivity and women's empowerment in outgrower schemes and contract farming

### Research

Conduct more in-depth research on the relative benefits of biofuel outgrower and contract schemes compared to other value chain models, particularly from a gender perspective – i.e. how are women and men differently affected by and able to participate in such schemes and in different crops. What are the issues specific to sugar cane, for example, as opposed to *Jatropha Curcas*? In different parts of the world the gender impacts will vary according to different cultural norms, political-economic contexts and across diverse agro-ecosystems. Establishing whether outgrower schemes can support women's empowerment (and that of poor male farmers) or whether they lead to indebtedness and increased labour for farmers, especially female farmers is of great importance as biofuel investments proceed. Specialised studies are required to provide detailed analysis of gender impacts, but monitoring and evaluation of impact should be integrated into on-going schemes as well to track change along gender lines.

### Local energy use

Build in local use of the energy generated not only export, including provision of access to women farmers.

### Gender awareness in private companies

Generally speaking, companies with a good ethos relating to corporate social and environmental responsibility should be encouraged and supported over and above more less progressive ones. Because companies provide much of the extension in outgrower schemes it is important to encourage them to consider the gender issues in extension (Martin and Nelson, 2008). Gender awareness training of their staff to enable them to work with women farmers and to understand their interests and to tailor information and advice accordingly. Training should be extended to female smallholders as well as male farmers with appropriate messages, locations and timing of extension to fit with women's needs and interests. Encourage companies to employ women extension workers.

### Access to resources

Improve access to credit, support for women's group formation, and skills training through government programmes and extension workers.

### Establish incentives

Support the establishment of schemes such as the Brazil Social Fuel Seal which encourage buyers to purchase biofuels from smallholders. It is important that targets are set to ensure that purchases from female smallholders are made, not only from male smallholders. Collect gender-disaggregated data in monitoring of the scheme.

### Contracting process

Contracting processes should be improved to the benefit of smallholders generally, and specifically tailoring activities to meet the needs and interests of women smallholder groups. Support for independent facilitation (e.g. through NGO representatives) to all smallholders in their contract negotiations with private companies is needed – but with especial support for female smallholders – where appropriate, but also be aware of institutional roles (e.g. of districts) in determining compensation payments.

### Science and contracts

Contract negotiations should be based on a fairly objective, scientifically derived measure of potential production problems – including different challenges that how women and men might face in meeting contract stipulations and quantities. Reduce ambiguity in the contract and clarify the risks carried by different parties from the outset.

### On-going negotiation capabilities and facilitation

Build in flexibility for on-going renegotiation of contracts as circumstances change, to identify possible improvements and to seek fairer arrangements. This is not common practice and governments and NGOs should pressure private companies to agree to continual re-negotiation opportunities and for women to maintain a voice throughout.

### Sustainable practices

Encourage more sustainable farming practices, because these are likely to help prevent food shortages. Where food security is undermined this can have disproportionate impacts upon rural women, because of their traditional subsistence responsibilities and because they are often first affected by food shortages. Encouragement of more agro-ecological farming methods, such as inter-cropping and rotations, could have a range of environmental and social benefits. However, sustainable farming methods can require more labour – if women are required to carry out more tasks without greater influence in decision-making and without more resources to carry out such tasks there is a risk that gender inequalities will be exacerbated. There is no easy solution, but ensuring that agricultural innovation research engages with women farmers in biofuel development will help to define both problems and solutions.

## **Sustainability standards for smallholders**

It is important that sustainability standards for smallholders in biofuel value chains are devised – covering production, but also other functions in the value chain. It is not easy for governments to enforce practices within private sector value chains, but clear guidance, incentives and regulations should be explored and set in place to encourage good practice in smallholder biofuel production. In particular, there is an opportunity to integrate gender issues in these standards outline above (e.g. supporting women's participation in contracting processes, ensuring consultations are in appropriate languages and use media that reach women such as community radio, female focus groups; setting targets in financial incentives such as the Brazil Social Fuel seal for numbers of women included, etc). It is important that all sustainability standards require fair and transparent contracts and it should be stipulated that this extends to the participation of women and to women farmer's interests as well as that of male community members.

### **4.3 Improving gender-sensitivity of biofuel agricultural innovation and extension**

#### **Identify production and marketing constraints**

Scientific and participatory research is urgently needed into biofuel feedstock production and the marketing constraints faced by smallholders – female as well as male.

#### **Improving gender sensitivity in extension services**

It is also well known that agricultural extension services often suffer from 'gender blindness', with more male extension workers than female ones, and information provision tailored to male smallholders interests. Often the timings of events that are organised better support male participation more than women's participation. However, there is also extensive guidance literature on how to improve agricultural extension services and more broadly agricultural innovation (engaging all key actors, not only researchers/extension workers, in more participatory research and action) in ways that reach out more to women farmers (Martin and Nelson, 2008). Improvements can be made through the following measures: adoption of gender sensitive participatory research and extension good practice; recruitment of more female extension workers; increased focus on women farmers' priorities and crops; ensuring appropriate timing, methods and materials in communicating messages; encouraging extension workers to support farmer learning, including that by women innovators, rather than expecting only to impart messages. In particular, programmatic support for women's entrepreneurial activities is important, helping them to share risk or have increased access to inputs (e.g. credit schemes). This is because gender roles and socialisation can mean women have less confidence and experience in acting as entrepreneurs and face greater barriers in establishing and maintaining income generating activities, such as sale of electricity from multi-functional platforms.

## **Impact assessment**

The gender impacts of new biofuel technologies should be assessed before widespread implementation. For example, a key issue for consideration is how a new technology changes the division of labour and work burden between male and female household members and how it changes rural employment intensities, food security levels and climate resilience. It is important to consider who is benefiting and who bears the costs of a new technology in terms of work burden, but also in terms of controlling any cash generated. Female and male farmer participation in piloting and technology generation processes is urgently needed to ensure the interests and priorities of women as well as men are heard and so that the new tools, equipment or plants are appropriate for both male and female producers.

## 5. Gender issues and smallholder roles in biofuel value chains beyond production

### 5.1 Gender dimensions of social upgrading of smallholders in biofuel value chains

Beyond contract farming, there may be other options for improving smallholder participation in biofuel production, especially that of women, by setting up alternative land holding structures and production models such as village land trusts or equity-based joint ventures which could link private, public, local and civil society groups in biofuel innovations (Sulle and Nelson, 2009). For example, joint ventures in tour operator-village tourism initiatives have been in operation in Tanzania from almost 20 years governing tourism company access to village lands. Given legal and market support, villagers have conducted their own negotiations, although such alternative models are not well known by financiers, government and other actors (Sulle and Nelson, 2009). However, from a gender perspective, it is instructive to note, that there is also evidence that such joint ventures can suffer from elite capture of benefits – with marginalised groups and women being less likely to benefit or participate in decision-making. A study of a tour operator–local community partnership in Robanda village, adjacent to the Serengeti National Park has brought in revenues but the large majority of villagers were not sharing in these benefits (Campbell and Nelson, 2001). Thus attention needs to be paid to how a more equitable distribution of benefits and participation can be facilitated and by whom. Other models include community land inputs being exchanged for company shares. A sugarcane scheme in Mauritius provides an interesting example of equity sharing, with smallholders given an equity share in electricity sales (Deepchand, 2004, cited by Dubois, 2008).

Few women are involved beyond the production stage of biofuel value chains, i.e. in processing, distribution and marketing. In South Africa, for example, female and male smallholders are involved in a government supported sunflower and soya bean project for biodiesel production. Women who were interviewed stated that they would like to be involved beyond seed production as stipulated in their contracts (see Box 9 right).

It is important for policy-makers to identify opportunities to enable social upgrading of smallholders in global value chains – especially female smallholders – so that they have greater understanding and power in the value chain and increase their economic returns to support their livelihoods. Upgrading could mean greater capture of added value in processing through shared ownership or co-operative mills, giving smallholders shared equity in schemes, as in Mauritius, or greater smallholder engagement in distribution roles and end-uses. The high costs and complexity of biorefineries means that smallholder involvement is unlikely to be facilitated any time soon (Vermeulen et al, 2009 – Diagram 1 overleaf).

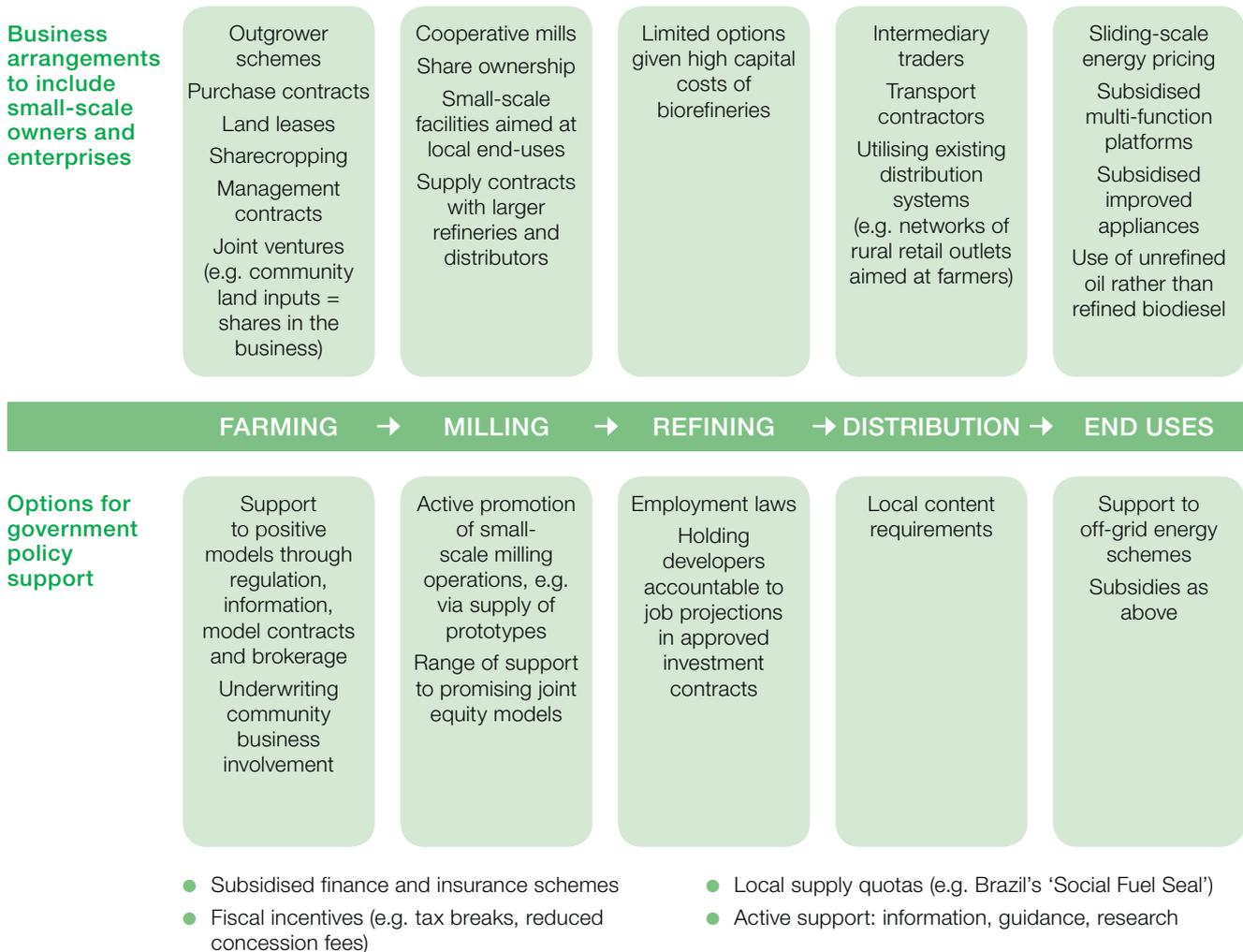
#### Box 9 South Africa government smallholder biodiesel project

A government project in marginal Limpopo Province was set up in 2006 and has supported smallholders to intensively produce sunflowers and soya bean as feedstock for a biodiesel plant.

- The project provides technical extension, strategic business support services and free seeds for a three year period to male and female outgrowers. Jobs may be created and multiplier effects on rural economies are possible. Women participants were positive about the income generated by the sale of jatropha seeds, bringing them greater influence in the household.
- Some women also noted, however, the added work burden involved in threshing and seed selection. They also said that meeting the contract targets for sunflower seed production can be difficult in situations of climate variability (especially in the driest parts of the river valley).
- Concerns about about the water-intensity of energy cropping in a water-scarce country, and the possible risks of exacerbating hierarchical land and labour relations and effectively trapping farm workers, especially women, in continuing subordinate relationships without gaining benefits from the crops they grow.
- Some women said they would like a greater role in project management.
- They would also like to move beyond seed production. ‘Women farmers said they did not know how seeds are converted into biodiesel, how much the biodiesel could be sold for, or where it is sold as an end product. They were convinced that others in the value chain are benefiting more than them’ (p32).
- Non-participating female farmers identified poor access to land as a key barrier to participation and argued for more land and water rights for women, as well as greater access to information through community radio and church meetings.
- Reform processes in the extension service have also limited farmers’ access generally to information and support services on biofuels. The article does not state whether this specifically affects women farmers, but male bias in extension services is a well known issue.

Source: Banda in Karlsson and Banda, 2009

**Diagram 1** Biofuel business models (from Vermeulen et al, 2009, p4)



## 5.2 Identifying value chain opportunities for female smallholders beyond production

### Evaluate alternative models

Evaluate the potential of promising initiatives in biofuel development that enable smallholder participation. Different value chain models are emerging but are less well understood than the large-scale land transfer commercial initiatives. The potential for replication of such approaches in which social upgrading for smallholders – especially women farmers – in the value chain should be assessed and the information shared with key actors, including the private sector and should be given greater attention in biofuel policy formulation.

### Identify and find solutions for upgrading obstacles

Identify the gender-related obstacles and opportunities that are specific to biofuel upgrading (e.g. more limited access to formal education can disadvantage women in their accessing of employment further downstream). Sometimes women farmers also have less access to information about commercial value chains and their operations than male farmers. Representation of women along the value chain is likely to decrease particularly where skilled labour is required, e.g. in biorefinery management.

### Capacity building

Provide funding for capacity building of (especially female) smallholders including participatory analysis of the structure and functioning of the value chain to increase transparency and understanding and support for farmer organisation.

### Seed funding

Provide seed funding for trialling new 'business models' which specifically target or support the involvement of women and socially marginalised groups in more downstream activities or in sharing of benefits (e.g. equity sharing, financial incentives such as the social fuel seal) to enable them to have greater power in biofuel value chains and the ability to capture more added value. Agricultural innovation system actors (government policy-makers, private sector investors, input suppliers, NGO representatives, community leaders and farmers, etc) may all need to be involved in the operation of such schemes, but changes of attitude, incentives and leadership from government is likely to be required – as well as better access to technical advice, technologies, skills, farmer organisation etc to achieve women's empowerment through social upgrading.

## Research

Research is needed to assess the environmental impacts of outgrower schemes involving many smallholders – as the activities of many smallholders can cumulatively have a large impact on the local environment, potentially undermining the resilience of ecosystem services and livelihoods – with women being disproportionately affected.

## 6. Gender and decentralised, community-based biofuel programmes

### 6.1 Gender dimensions of small-scale, community programmes

Decentralised, small-scale schemes appear to be the most likely to have positive rural development impacts for local communities, especially for rural women and marginalised groups (Rossi and Lambrou, 2009; Dubois, 2008; UNDESA, 2007; ENERGIA 2009; UN, 2007; Karlsson and Banda, 2009; Practical Action Consulting, 2009; Vanwey, 2009). They can provide improved access to clean energy, releasing women from the burden of finding and using energy for domestic and agricultural subsistence tasks. This can sometimes lead to in turn to educational and health improvements. Some projects target women's groups specifically, promoting their empowerment and livelihoods. Positive impacts include the generation of income from the sale of feedstock seeds, diversified livelihood activities and increased entrepreneurship amongst women through the sale of electricity.

Conclusions from a whole series of case studies on biofuels, sustainable development and gender were that rural communities tend to be most interested in the income generation potential of feedstock cultivation, producing pure plant oil or biodiesel, and generating electricity or motorised power services, or providing other services powered by biofuels energy (Karlsson and Banda, 2009). Food security and work burden benefits could be obtained through increased energy enabling longer-term storage, refrigeration and transport of food (especially when public transport is being relied upon, as is the case often by women) (Clancy, 2008, Practical Action Consulting, 2009).

An analysis of a jatropha project in Gbimisi, northern Ghana found that there were a range of benefits being obtained by the women's group, who have received training in accounting, production, etc. The project is based on using energy from Jatropha for shea butter processing and to substitute kerosene in lanterns. The benefits include: extended availability of electricity; more children enrolled in school, because families can afford the school fees; reduced drudgery for women in shea butter processing and higher productivity; access to the grinding mill and alternative methods for kernel crushing and pressing for oil extraction, saving time for the users; new seed capital from local community bank for shea kernel purchasing; participation in meetings and workshops in the village broadening the horizons of women encouraging greater self-esteem and negotiating skills; increased opportunities for women to generate income for the household; women have full control of the agro-processing equipment and profits; gender sensitivity training which has helped other household members, especially men, to accept and support the women in their activities and chores (Anokye Mensah in Karlsson and Banda, 2009).

However, there are also challenges for the project: illiteracy is limiting women's full participation in community development and political processes; women have had to overcome difficulties in learning to manage the equipment,

but the process has built their self-confidence; it is not clear if there are sufficient markets for the increased production of shea butter; and more agronomic information is needed on jatropha, including ecological risks for arable land production (Anokye Mensah in Karlsson and Banda, 2009).

There is thus no guarantee that different groups of women and marginalised groups will benefit from development projects, or be equally affected by more negative outcomes, and as with all rural development interventions, gender analysis should be embedded at each stage of the project or programme cycle. Access to energy can help reduce women's workload and drudgery, but extra work can also be created by new tasks. New technologies are not introduced into a vacuum, but are inserted into existing power dynamics. Whilst individual women and social actors can exert agency, it is also the case that where gender norms are deeply embedded these can be difficult (though not impossible) to challenge.

Over time there are risks that women in a household or community could be dispossessed of key resources as they generate cash or be denied a share in new income from sale of feedstock or electricity. Successful schemes – whilst providing significant benefits such as those outlined above – may increase land values, competition over tree and water resources and create contestation over new sources of household income. Attempts to develop decentralised, local systems could be undermined by global pressures that absorb the trade. Concern is expressed in an Indian case study that if local seed supplies are bought up by moneylenders and large-scale processors or oil mills undermine attempts to add value this could challenge the sustainability of the project (Vaidyanathan and Sankaranarayanan in Karlsson and Banda, 2009). Therefore the sustainability of small-scale, decentralised schemes may be undermined if large investors buy up seeds and land.

Beyond the distribution of impacts, it is also clear that male and female participation in decision-making is relatively unequal. There is also the potential for cumulative environmental impacts, where many smallholders are involved. Agro-ecological methods can be employed to reduce loss of resilience in agro ecosystems – although again this can require more labour which may disproportionately affect women.

There are also risks associated with pilot or experimental activities and there are outstanding technical and scaling-up challenges – producing biodiesel from Jatropha involves hazardous chemicals, poses organisational and investment challenges and requires reliable input supplies (Karlsson and Banda, 2009). Female smallholders may have fewer resources with which to take risks and to cope with failures in Jatropha and other biofuel schemes. Some concerns have been expressed that donor projects might also prove unsustainable once funding dries up.

One of the most promising approaches is the Multi-Functional Platform (MFP) technology, which was initiated in Mali but is now being piloted in other developing countries, such as Uganda and Tanzania, with biodiesel and pure plant oil production being obtained from Jatropha.

#### **Box 10** Multi-Functional Platforms (MFPs)

A small diesel engine, mounted on a chassis, it can be adapted to run on Jatropha oil, to generate electricity or for attachment of diverse end-use equipment to enable various activities (e.g. oil pressing, electricity generation for water pumping, lighting, workshop tools, milling of cereals, inflation of tyres, etc). Early West African experiments using biodiesel or pure plant oil from Jatropha Curcas L. have shown positive impacts, especially for members of women's groups (sunflowers are also being used in Uganda). Before rapid scaling up, more detailed impact assessment is needed, plus technical capacity building for running the platforms and improving yields. One study (Henning, undated) suggests that Jatropha use in Tanzania has expanded more rapidly than in Mali, with the full potential of jatropha oil use in Mali not being realised because of gender relations. Although women traditionally collect the seeds to make soap, the jatropha hedges are seen to belong to men. The new oil extraction technology has raised the quality of women's soap enabling them to obtain higher prices, but control of the income has been contested between women and men, with men refusing use of the hedges unless they are given part of the returns. In Tanzania, whilst there are similarities in hedge tenure (traditionally male) there has been much less contention over control of the returns and so more women are collecting the seeds, extracting the oil to make soap and having greater control over the income. Thus it is critical to consider gender relations, control of income and assets, and workloads in evaluating potential bioenergy projects and to work with women's groups to challenge constrictive gender norms, build capacity and increase access to inputs.

A UNDP and Uganda government MFP project in Uganda is prioritising women's involvement, with women mainly owning and managing the platforms and being given training and technical support. A milk chiller, bore-hole pump and maize mill is being powered in one village, in another village a rice huller and maize mill are being powered, energy services are being provided for local entrepreneurs, and there are plans to establish a mini grid. The study authors state that because the agricultural workforce is largely female in Uganda, (80%), women's work burdens should be cut, and more women should be able to engage in other more profitable activities and more girls should be able to attend school regularly. The authors also outline concerns that rising land values will lead to loss of land rights for poor people and women raised concerns that male villagers will start to grab the land (Babagura, in Karlsson and Banda, 2009). However, there is limited evidence on actual impact – proposed benefits and concerns abound but in-depth study would help to provide insights and lessons for best practice in scaling up and replication.

Few studies or projects seem to analyse the gender aspects of participation and impact distribution. For example, a monitoring visit report to a 'community generated power programme' involving jatropha production for local biofuel use in Zambia by Annecke (2008) identifies a range of positive benefits flowing from the project (e.g. 40 jatropha nurseries established, 800 farmers trained in cultivation, biodiesel processing plant installed etc. Although a baseline study has been conducted and monitoring is being set up, there were no plans to collect gender disaggregated data (Annecke, 2008).

A recent study commissioned by FAO and PISCES (Practical Action Consulting, 2009) analyses the livelihood impacts of a range of small-scale biofuel initiatives, identifying livelihood impacts, but not the gendered nature of these. Five out of the fifteen FAO-PISCES case studies<sup>2</sup> target women's groups to deliver aspects of the project, with the groups mainly having roles as traders or processors at the village level. A number of projects reported that jobs have been created at factories or at a professional level, but figures are not disaggregated by male and female employment and the associated terms and conditions. A number of the studies report specific benefits for women: e.g. the Vietnam Farm Biogas project reported that the biogas fuel reduced the amount of hazardous smoke that women are exposed to from wood fires (a practical gender need), which helped to improve women's health and quality of life (a strategic gender need). The Ethiopia Ethanol Stoves case study was shown to be reducing women's workload by substituting fuelwood. A Senegal Chardust Briquette project is based on women's groups, which have reportedly strengthened social relations in the community by building partnerships between women and other stakeholders. These case studies represent an important resource for understanding the potential of different biofuel technologies in promoting rural development, but more systematic gender analysis in such studies would reveal important information about how the projects are challenging existing inequalities or possibly reinforcing them.

## 6.2 Increasing gender sensitivity and women's empowerment in community-based, decentralised biofuel programmes

### Support women's groups and local community biofuel schemes

Support for decentralised, community based biofuel schemes is critical and lessons should be learned from new initiatives beginning across the world. Technical and institutional support is needed to get such programmes running, and to take steps to ensure sustainability of schemes (e.g. helping to ensure smallholder access to feedstock seeds). Women need access to and control over land, labour and resources (e.g. water, seeds, and fertilisers).

### Resources

Provide resources for community-based biofuel schemes, such as multi-functional platforms. It is important to target funds to women's groups or at minimum to support smallholder participation in biofuel schemes generally, but particularly women and female-headed households. Ensure that implementation is participatory and appropriate to/owned by local communities, especially women. New sources of climate change funding (mitigation and adaptation) should also be explored.

### Gender sensitive project cycles

Follow good practice in ensuring gender-sensitivity in projects: involve women as well as men throughout the project cycle; take account of intersecting social differences such as age, class, ethnicity as well as gender; understand the different roles, relations, constraints, opportunities and aspirations that women and men experience which shape their potential involvement in biofuel. Gender-disaggregated monitoring and evaluation of impact should be integral to community based programmes to improve impact on an on-going basis.

### Safeguards and increasing access to natural resources and land

Safeguards are needed to prevent dispossession of women and local communities and also efforts to increase their access to natural resources (land, trees, water, etc) through community based management, access to public lands, etc.

### Specific feedstock and country studies

More case study analysis is needed of the issues relating to each different possible feedstock (e.g. oil palm, sunflowers and jatropha) and associated practices. Proper impact monitoring is needed to ensure that biofuel projects do not mean women end up with more work without extra resources to cope and greater decision-making power (e.g. over extra income generated). Identify successful examples of women's involvement in production, but also in processing and marketing of energy services. More lessons are needed on the elements and conditions for success and failure. Do not include feedstocks for biofuel programmes where their use will undermine food security.

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<sup>2</sup> These case studies are: Senegal Chardust Briquettes to sell briquettes; Senegal Typha Charcoal to promote and sell charcoal; Kenya Afforestation Charcoal to produce seedlings; India Jatropha Electrification for procurement, collection of seeds and food crops; Biodiesel based Water Pumping Programme for procurement, collection of seeds and construction of washrooms and maintenance (PAC, 2009).

## 7. Biofuel policy and gender

### 7.1 Engendering biofuel policy

There are many challenges in making biofuel developments more gender sensitive and ensuring equity in process and in outcome. However, there are also opportunities particularly in community based schemes and potentially in outgrower/contract farming although the latter in particular requires more research in different countries to be sure of positive outcomes. As many developing country governments are also still in the process of developing their policies in this field, this means there is a new biofuel policy space opening up – and the opportunity to engender biofuel policies by promoting women's interests and those of other marginalised groups to ensure that they are adequately articulated and their participation in policy processes facilitated, and to advocate for 'smallholder-friendly' and 'women-friendly' options.

It is thus important that women's active participation in policy making is promoted to help bring their priorities and interests to the fore, given that at the moment this is rarely the case. Governmental policy-makers in (bio)energy as well as land, forestry and agriculture departments can play a key role in increasing the gender sensitivity of biofuel innovations – but should learn from new evidence emerging from the field on best practice especially with attention to gender and social impacts. Finally NGOs, academics and private sector actors could take up the recommendations below on building awareness of and commitment to gender equality amongst their professional staff and in their biofuel activities, including lobbying, applied and action-research and project implementation.

It is important to remember that women are not passive victims. Even though they often suffer discrimination and are likely to be disproportionately affected, they also have capabilities and specialised knowledge of relevance to biofuel developments (e.g. in the cultivation of *Jatropha Curcas*). Women can be active agents in shaping biofuel policies and rural pathways, and in some locations are already taking independent, collective action. There are also ample opportunities for governments, civil society organisations, donors and the private sector to support their voices to achieve more equitable rural futures.

### 7.2 Raising gender issues up the agenda in biofuel policy-making

#### Leadership, strategies, focal points and champions

Leadership is needed from top management in companies, government, NGOs and local communities to illustrate what can be done to change entrenched gender discrimination and support women's agency. High-level support is needed for change in organisational cultures to achieve more gender equality, with comprehensive gender sensitivity training a priority for biofuel professionals across government, civil society and private sector organisations. Gender champions and focal staff (supportive of gender equality, but not necessarily female) can be appointed in key organisations, such as energy or forestry departments, but it is important that they are given strategic responsibility to mobilise resources, to lobby for higher prioritisation of decentralised, small-scale biofuel in energy planning,

etc. Provision of scholarships, clear gender policies and enforcement of specific targets (not lower than 30%) of women in key decision-making positions are needed to promote women's leadership and positive role models – including in biofuel arenas.

#### Use of gender specialists

Gender specialists can be used to improve gender analysis in policy development and in policy impact assessment. Gender budgeting and gender-specific monitoring and evaluation in sectors that affect biofuel is critical.

#### Appraisals

It should be part of government policy to ensure that in-depth appraisals are conducted prior to the awarding of any large biofuel concessions or leases of the potential social and environmental impacts. Analysis of potential gender impacts should be a clear and important element of any such appraisal and the voices of women, as well as male community members, should be heard via the facilitation of participatory processes.

#### Monitoring and evaluation of biofuel schemes

Monitoring and evaluation should be integrated at the start of any initiative, with disaggregation of data along lines of gender and social difference.

#### Civil society roles

Support for civil society capacity building can be important to ensure that women's groups and representatives have the support they require so that they can raise awareness of the gender dimensions of biofuel, and forge alliances to promote learning about biofuel possibilities, and to increase their ability to lobby against and prevent more negative developments. Networking and cross-scale alliance building are important for learning and advocacy to engender biofuel policies and participation of women in policy processes.

#### Legal and policy reform

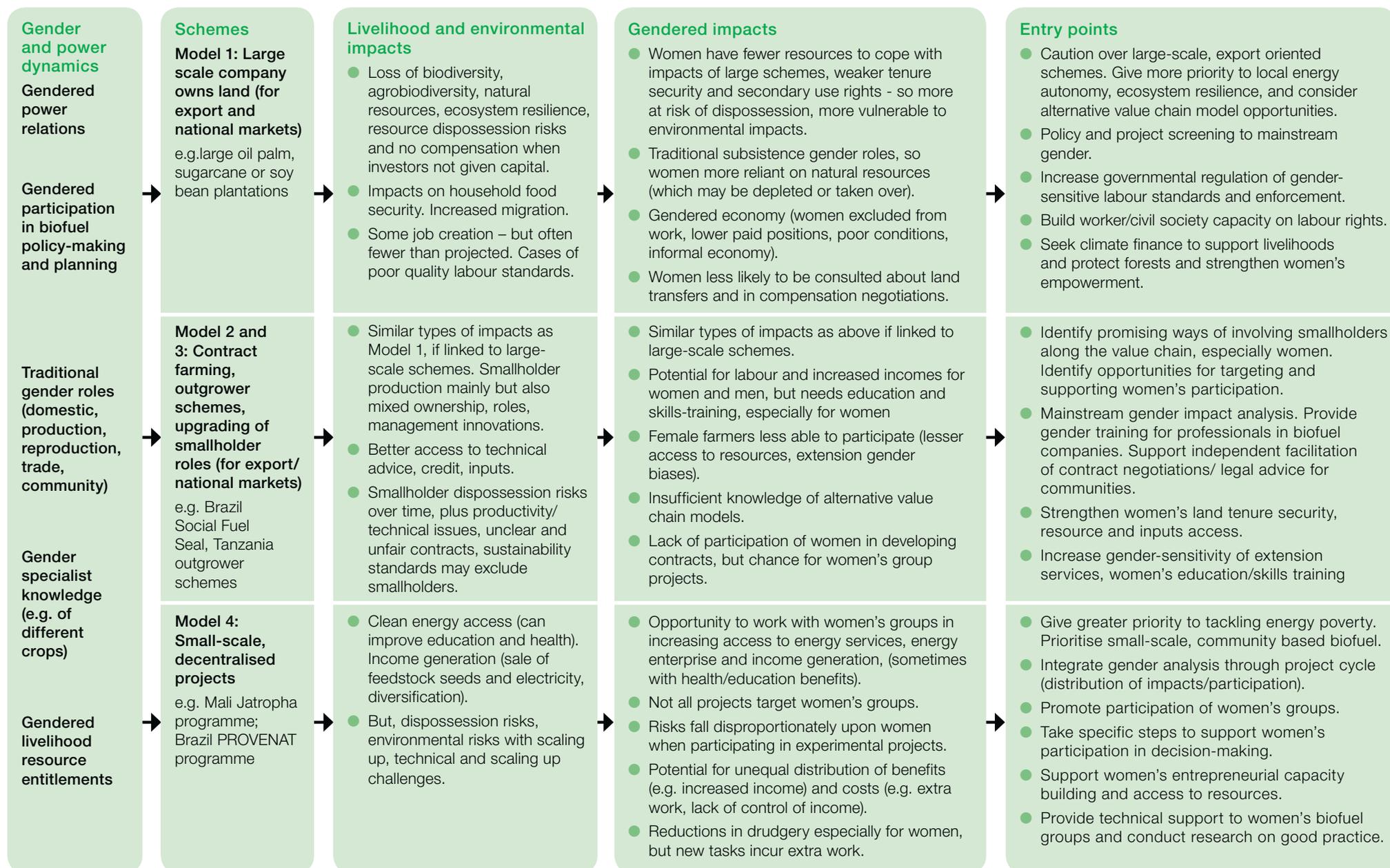
To create a favourable environment for gender equality, in which biofuel schemes can be developed, it may be necessary to identify specific changes in laws where there is gender discrimination. Similarly, policies, guidelines and incentives should be made more gender sensitive. Financial mechanisms such as the Brazil Social Fuel Seal could play an important role in supporting smallholder participation in value chains – but should include specific targets for women's participation.

#### Explore the potential of second generation biofuels

Second-generation biofuels, using recycled waste oils or cellulose containing plant residues such as rice husks, wheat straw or wood chips may have fewer negative environmental and social impacts than first generation biofuels, such as sugar cane, and palm oil, etc. The socio-economic and gender dimensions of second-generation biofuels require attention as they become commercially available.

**Diagram 2** Biofuel and rural livelihoods – vulnerability and policy context

International (e.g. globalisation, rising/volatile energy prices, oil geopolitics, climate change, increased democracy and decentralisation processes) and national diverse energy policy aims and lack of biofuel policy guidance, rapid private sector investment, diverse land tenure and ownership patterns, gender equality trends, economic growth and social inequality trends, value chain stakeholders of varying power and roles.



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## Annex

**Annex 1** Coverage of gender issues in various biofuel related sustainability standards and initiatives

Certification scheme	Explicit mention of gender issues in scheme's aims, scope or standards	Implicit gender implications of existing standards
Roundtable on Sustainable Biofuels (RSB)	<ul style="list-style-type: none"> <li>Includes criteria on freedom from discrimination (workers).</li> <li>“Special measures that benefit <b>women</b>, youth, indigenous communities and the vulnerable in the affected and interested communities shall be designed and implemented, where applicable”. Large producers/processors required to work with local government/NGOs to implement these.</li> </ul>	<ul style="list-style-type: none"> <li>Food security and rural development criteria, if implemented, could help protect and improve livelihoods for local women as well as men.</li> <li>Addresses issue of “marginal lands”, i.e., that these could actually be source of livelihood for local people (in practice, often poor women).</li> <li>Addresses water rights and access issues – which if implemented could also help protect women in particular (time spent collecting water).</li> <li>Workers’ rights criteria – explicit that these apply to all types of workers.</li> </ul>
Renewable Transport Fuel Obligation (RTFO) Sustainability Standards	<ul style="list-style-type: none"> <li>Includes criteria on freedom from discrimination (workers).</li> </ul>	<ul style="list-style-type: none"> <li>Legal contracts to be provided to all types of workers including temporary workers.</li> <li>With respect to land rights, producer is required to respect “important areas for local people”. This is vague, but could be used to defend, e.g. common property resources relied on by poor women for livelihoods.</li> <li>Recommended good practice re: fair contractual relationships with smallholders could benefit female smallholders.</li> </ul>
Better Sugarcane Initiative (BSI)	<ul style="list-style-type: none"> <li>Includes criteria on freedom from discrimination (workers).</li> </ul>	<ul style="list-style-type: none"> <li>All labour criteria explicitly applicable to all types of workers including migrant, seasonal and contract labour.</li> </ul>
International Sustainability and Carbon Certification (ISCC) Project	<ul style="list-style-type: none"> <li>Includes criteria on freedom from discrimination (workers).</li> </ul>	<ul style="list-style-type: none"> <li>Coverage of respect for water rights and ensuring water usage doesn’t conflict with daily water needs of local communities – which if implemented could also help protect women in particular (time spent collecting water).</li> <li>Respect for land and resource <i>usufruct</i> rights – helpful for women, who typically do not have formal land/resource rights.</li> <li>Criteria for fair and transparent contractual relationships with smallholders could benefit female smallholders.</li> </ul>
Brazil ‘Social Fuel Seal’		<p>No explicit gender criteria, but:</p> <ul style="list-style-type: none"> <li>Promotion of small-scale farming of feedstocks increases likelihood that women (who do not tend to own large amounts of land) can participate and benefit from feedstock production.</li> <li>The avoidance/reduction of large-scale monoculture farming of feedstocks in itself prevents or at least reduces many of the negative impacts/risks for poor women arising from feedstock production.</li> </ul>
Basel Criteria (via ProTerra certification)	Includes criteria on freedom from discrimination (workers).	All labour criteria explicitly applicable to ‘contractors’ – not clear what this means, but could be relevant to contract workers and/or smallholders contracted by grower – both of which could potentially benefit women.

Certification scheme	Explicit mention of gender issues in scheme's aims, scope or standards	Implicit gender implications of existing standards
<p>Roundtable on Responsible Palm Oil (RSPO)</p>	<ul style="list-style-type: none"> <li>● Includes criteria on freedom from discrimination (workers).</li> <li>● Includes criteria requiring policy on sexual harassment and protection of women's reproductive rights at work. Includes consideration of setting up gender committee and ensuring women have access to training, given specific breaks for breast-feeding, provision of child care facilities.</li> <li>● In conducting social impact assessment for new plantations, requires consideration of differential impacts on women and men in local communities.</li> </ul>	<ul style="list-style-type: none"> <li>● Recommends separate policy to ensure migrant and temporary workers are treated equally.</li> <li>● Respect for/protection of customary rights to land.</li> <li>● Recommends that water management plan should ensure water use does not have adverse impact on other water users.</li> </ul>



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