Climate change adaptation and mitigation through improved tenure security for smallholder farmers

1. Introduction

Agriculture is both a major contributor to global greenhouse gas emissions (World Resources Institute 2013), and a sector that is highly exposed to climate change impacts. Many proven strategies are available for mitigation and adaptation (FAO 2013a & IPCC 2007), but they often require longer-term investments, such as planting trees, rotating crops, or purchasing equipment to support no-till farming. This article focuses on land tenure as a critical factor in the viability of "climate-smart" agriculture among smallholders in developing countries.

Collectively, farmers, most of whom are smallholders are by far the largest investors in agricultural production and they produce the bulk of the food consumed in many developing countries (FAO 2012a). Yet smallholders often live in poverty and have weak land rights; they may not own the land they cultivate or have legally defined and protected user rights. Farmers' own savings and on-farm investments are essential to the sustainable intensification of agriculture, but the risk of losing land and associated natural resources makes it difficult for many smallholders to predict returns on investments (CFS 2011; FAO et al. 2010). Thus, insecure land tenure is a great barrier to up-scaling of climate-smart agriculture.

There is a great heterogeneity among smallholders, and no one-size-fits-all approach to enabling and motivating them to invest in agricultural practices that lead to sustainable intensification, increased resilience and enhanced soil carbon sequestration. However, secure land tenure is one key element, along with improved access to financial capital and other inputs, infrastructure, social services, extension services and markets (FAO 2012a).

2. Land tenure and carbon finance

A largely untapped potential source of revenue for smallholders is carbon finance under the United Nations Framework Convention on Climate Change (UNFCCC). Through various UNFCCC mechanisms, including the Clean Development Mechanism (CDM) and the newer Reducing Emissions from Deforestation and forest Degradation (REDD+)

programme, smallholders can earn and sell credits for applying agricultural practices that increase carbon storage or decreasing emissions from land degradation and deforestation. Such schemes may provide cash and, perhaps more importantly, non-cash benefits such as institutional capacity development, extension services and other support measures that lead to higher total factor productivity (Shames et al. 2012).

Taken together, smallholders manage vast areas of farmland, wetlands, pastures and forests. Their potential to sequester carbon in soil and plants and reduce GHG emissions is therefore considerable. The cost-benefit ratio of such measures looks very promising, as there are often co-benefits between agricultural practices that mitigate climate change and increase resilience and total factor productivity (FAO 2011a; FAO 2011b). Co-benefits are not automatic, however, and there can be trade-offs, such as when land is taken out of productive use so it can provide long-term carbon storage (Shames et al. 2012).

Successful projects rely on training and equitable benefit-sharing schemes that improve and sustain local livelihoods. WOCAN (Women Organizing for Change in Agriculture & Natural Resource Management) recommends a number of measures to ensure CSA programmes operate in a "supportive political, economic and cultural environment" (El-Fattal 2012). Investments in supporting the local community are most effective when they are focused on both men and women equally. Facilitating women's access to land and credit, as well as training in business skills and leadership can ensure the permanence of community initiatives. However, a lack of support in CSA methods coupled with uncertain land tenure and land availability often leads to a preference for quicker returns prioritising the accumulation of credits (such as obtained through plantation-style monocultures) rather then integration with local livelihoods (Havemann, T 2012). Once the value of lands begin to be increased through carbon sequestration there is a risk that large landowners or government agencies may come to claim them, thus placing a greater emphasis on the importance of securing equitable land tenure in advance of project implementation. (Shames, S, Buck, L E, and Scherr, S J 2012). A strong institutional and management framework accompanied by a transparent and secure system of land tenure rights is therefore essential (FAO et al. 2010).

Large-scale land acquisitions in countries with weak institutional frameworks and poorly protected land rights – often made for production and export of food, animal feed, fibres, timbre and biofuels (FAO 2013; Vermeulen, Cotula, and IIED 2010; Wily 2011) but also for carbon sequestration/offsetting projects (USAID 2010) – can lead to marginalization and displacement of smallholders, who often find hard to mount a legal response (FAO 2013; Vermeulen, Cotula, and IIED 2010; Wily 2011; USAID 2010). This is a common problem with land used to produce and export food, animal feed, fibres, timber and biofuels, but can also be the case with carbon sequestration/offsetting projects. Even in cases where governments or commercial agents try to behave responsibly, rumours of forthcoming large-scale projects can create expectations of increasing land values, leading to land-speculation by local elites at the expense of vulnerable groups (Carrero & Fearnside, 2011). However, if due attention is given to land tenure issues and participation of local populations in the design and implementation of projects, it is possible to create durable shared value and avoid conflicts over productive resources (FAO et al. 2010).

3. Potential benefits for smallholders

To date, the leverage of carbon finance in the agricultural sector has been very limited, and few agricultural projects funded by mechanisms under the UNFCCC have been initiated. In order to qualify for carbon finance, farmers need secure land tenure – to ensure long-term storage of the carbon – and sufficiently large areas to be economically viable (Zomer et al, 2008). This makes it particularly challenging to involve smallholders in such programmes. Since their average land plots are small, smallholder communities or groupings such as cooperatives and farmer groups need to get organized in order to aggregate contiguous tracts of land (Shames et al. 2012).

A successful example is a programme run by the NGO Vi Agroforestry in the countries around Lake Victoria in Africa. The NGO works with over 1.2 million rural inhabitants, many of them women, to adopt sustainable farming practices such as agroforestry – planting trees with crops – and thereby improve livelihoods, increase resilience and reduce pressure on ecosystems. This is the first soil organic and biomass carbon sequestration project in Africa. The main objective is to improve the livelihoods of the communities; carbon sequestration is a positive side-effect, but over the years, it has been integrated more explicitly in the programme, through farmer-based monitoring

(via the 26,535 farmers involved in the project) and selling credits on the voluntary market using the Verified Carbon Standard. This increased revenue has amounted to monetary savings of 3-5 USD per month for 73% of the participating farmers, as well as significant maize yield increases compared with the control (non-project sites) (Öborn et al., 2014; Vi Agroforestry 2012; Tennigkeit et al., 2013; World Bank, 2014). The NGO is aware of the importance of land rights for the success of the project. The same is true in the case of the Assisted Natural Regeneration Project in Ethiopia – in which carbon credits is supplied through the Clean Development Mechanism. Securing land rights is one of the primary objectives of this projects, and involved community members have the right to all products produced from the land, including credits paid for sequestered carbon (Cf USAID 2010; Shames et al. 2012).

4. Considerations for securing tenure rights in the context of large-scale land based projects

It is now well established that land tenure systems are key determinants of the outcomes of any land based investments (FAO 2013b).

Efforts to secure land tenure for smallholders should recognize a wide array of ownership and user rights and consider proper ways to involve already existing informal and formal institutions. Award of registered title for individuals or households has increased the propensity to invest in some situations. However, fragile institutions and limited enforcement capacity beset many countries, and many interventions to formalize individual rights to land have failed (Deininger 2011).

Customary and communal tenure arrangements can provide sufficient tenure security in places where customary institutions are strong and perceived as legitimate by different groups of land users. However, the flexibility of customary systems and large array of different user rights over the same lineage, village or communal land plot can make it challenging to determine equitable benefit sharing of carbon finance schemes without the participation of elders and local leaders, and a basing on constitutional provisions, legislations and policies (Farnworth et al., 2013). Notwithstanding, in theory, communal tenure systems managed by representative customary and/or elected decision making bodies may also allow the aggregation of sufficiently large areas for large-scale land based investment, including carbon sequestration/offsetting schemes (Cf Deininger 2011). In places where customary tenure patterns are absent or have collapsed,

identification, recognition and protection of individual or household user and/or ownership rights may be the most viable option. Examples of this include newly settled areas and areas with dense populations and high land values (Cf. Platteu, J P 2000).

Carbon finance in landed resources can lead to introduction of land markets in areas where land tenure rights were previously not transferable. This must be done with caution and can be inappropriate in some contexts. In land-scarce and poor areas, smallholders are likelier to sell their land to be able to buy food and other necessities or to pay debts rather than out of free will (Carrero & Fearnside, 2011). To ensure fairness and avoid land concentration as a result of distress sales, capacity development and support of smallholders to reinvest cash and resources received in exchange for land are needed. (Gerstter, C et al. 2011).

Because tenure reform is a political and highly sensitive process that involves a wide array of stakeholders and diverging interests, it must rely on participatory and transparent processes. Participatory land-use planning with a focus on identifying rights holders and legitimate mechanisms to resolve disputes are needed prior to any large-scale projects. Further, local communities and individuals that would be affected by a proposed project should have the right to contribute to the approval or rejection process of the proposed project in accordance with the principle of free, prior and informed consent. (cf. FAO et al. 2010). Innovative methods and new technologies offers less expensive and more efficient possibilities for participatory land use planning and demarcation and registration of different types of rights to own or use land and natural resources (cf. Deininger 2011; Wehrmann, B 2011).

Underprivileged groups such as informal tenants, landless people, or those who rely on the commons must be central in these initiatives. Women are often seriously disadvantaged in both statutory and customary land tenure systems, yet it is widely recognized that they play a key role in agriculture and often provide the bulk of food for household consumption (FAO 2010). Special attention to women's land rights can increase the likelihood of sustainable and equitable outcomes (Cf. Behrman et al. 2011; El-Fattal 2012; FAO 2010).

A number of major international, regional and national initiatives to improve tenure governance and secure the land rights of the poor – including the Voluntary Guidelines

on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (FAO 2012b) – are under way. There appears to be a big potential for coordination of land policy reforms and land-based climate change adaptation and mitigation.

5. Conclusions

A focus on sustainable smallholder agriculture is necessary to address the challenges of food security while at the same time increase adaptation to and mitigation of climate change. The costs of emissions reduction through sustainable farming methods can be low, and since changes in agricultural practices to increase carbon in soils are often conducive to agricultural productivity in the long term, they would also support the resilience of the agricultural sector to climate change (FAO 2011a; Tennigkeit et al., 2013).

Diminishing supplies and increased demand for land and land-derived goods and services place tenure issues at the centre of viable land-based responses to climate change. Tenure insecurity is a huge obstacle for smallholders. Thus, governments and NGOs wishing to facilitate climate change mitigation and adaptation among smallholders should make it a priority to understand the land tenure situation in the target area, and work to strengthen land tenure where it is weak. In many countries, significant legal reforms may be needed; in places where customary law and informal arrangements still play a major role, these will also have to be taken into account, to ensure that one does not undermine the other. Strong formal and informal institutions are also needed to enforce laws and protect smallholders' land rights. Community organizations may play an important role in supporting these efforts (Farnworth et al. 2013).

Functioning land tenure systems that consider a broad array of rights and responsibilities can enable and motivate smallholders to invest in climate-smart agricultural practices and participate effectively in carbon finance. A "landscape approach" that considers how land is being used in the broader area, not just by the targeted smallholders, can also help projects be more successful, by providing a full picture of the economic, social and environmental factors driving land use and demand for land and enabling the design of more sustainable interventions.

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