STEPS centre

Future Agricultures

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

# The Politics of Agricultural Carbon Finance: The Case of the Kenya Agricultural Carbon Project

Joanes O. Atela

# Carbon Agriculture

STEPS centre

# The Politics of Agricultural Carbon Finance: The Case of the Kenya Agricultural Carbon Project

In the context of major scientific and policy concern with the causes and implications of climate change, various actors are now keen to demonstrate how agricultural carbon finance can help achieve multiple benefits or 'triple wins' for sub-Saharan African agriculture. The target areas for these demonstrations have complex socio-political histories including prior donor interventions seeking to address related problems of poverty and the environment. Agricultural carbon finance, with associated globally framed narratives and interests, arrives on the back of these interventions and intersects with existing socio-cultural contexts and local and national policy processes to reshuffle livelihoods and ecologies. This paper explores this interplay empirically, drawing on evidence from the Kenya Agricultural Carbon Project (KACP). KACP is the first World Bank supported project on agricultural carbon finance in Africa and has worked with groups of smallholders in western Kenya since 2008. Fieldwork, interviews and document analysis show how a powerful donor-science network has established a dominant narrative around 'triple wins' which does not resonate well with local circumstances. Farmers, concerned with food security through maize farming, focus on only one 'win'- increases in maize production – with little awareness of or attention to climate resilience or carbon income. The Kenyan government, on the other hand, faces an implicit dilemma as to whether to mechanize agriculture as a quick fix for looming hunger or to embrace conservation agriculture for carbon finance. As more powerful, resource and scientifically endowed global and project development institutions intersect rather messier, informal and complex local institutions, there is not a neat unfolding of a planned 'agricultural carbon project' – but a more complex situation from which various actors are nevertheless able to draw benefit, but from which certain farmers lose. This paper therefore justifies the need to go beyond top-down donor and science-driven projectization of agricultural carbon finance. Approaches and associated capacity-building need to inform farmers more fully of links between sustainable farming practices and carbon; clarify their carbon rights, and attend to wider development issues such as water access and secure land tenure which bear heavily on carbon projects. This is vital if smallholder farmers are to become more empowered to expand their opportunities and wellbeing in the context of climate change and the uncertain promise of carbon money.

## About the Author

**Joanes Atela** is a PhD candidate at the Sustainability Research Institute, University of Leeds in the UK. His PhD dissertation is on the implication of climate change institutions and adaptive capacity of local communities in sub-Sahara Africa. He holds a Master's of Science (First Class) in Agricultural Sciences and Resource Management in the Tropics and Subtropics from the University of Bonn, Germany and a Bachelor of Science (First Class Honours) degree in Environmental Science from Maseno University, Kenya. His research interests draw from his early life in the rural parts of western Kenya where his family's livelihood entirely depended on ecosystem services especially those supporting agriculture. His specific areas of research include; payment for ecosystem services, climate change policies, environmental governance, agriculture and rural development. He was a fellow with the Future Agricultures Consortium and The New Partnership for Africa's Development during which he undertook this research. He has worked with the Kenya Agricultural Research Institute in an ecosystem management project with communities around Lake Victoria region and was a research intern at the United Nations Environment Programme where he researched carbon related issues in relation to smallholder farmers around forests.

## About the STEPS Centre

Today's world is experiencing rapid social, technological and environmental change, yet poverty and inequality are growing. Linking environmental sustainability with poverty reduction and social justice, and making science and technology work for the poor, have become central challenges of our times. The STEPS Centre (Social, Technological and Environmental Pathways to Sustainability) is an interdisciplinary global research and policy engagement hub that unites development studies with science and technology studies. We are developing a new approach to understanding and action on sustainability and development in an era of unprecedented dynamic change. Our pathways approach aims to link new theory with practical solutions that create better livelihoods, health and social justice for poor and marginalised people. The STEPS Centre is based at the Institute of Development Studies and SPRU Science and Technology Policy Research at the University of Sussex, with partners in Africa, Asia and Latin America. We are funded by the ESRC, the UK's largest funding agency for research and training relating to social and economic issues.

**www.steps-centre.org.**

Follow us on Twitter **@stepscentre**

## Other titles in this series include:

| | |
|---|---|
| **Approach** | Pathways to sustainability: an overview of the STEPS Centre approach |
| **1. Dynamics** | Dynamic Systems and the Challenge of Sustainability |
| **2. Governance** | Understanding Governance: pathways to sustainability |
| **3. Designs** | Empowering Designs: towards more progressive appraisal of sustainability |
| **4. Agriculture** | Agri-Food System Dynamics: pathways to sustainability in an era of uncertainty |
| **5. Health** | Health in a Dynamic World |
| **6. Water** | Liquid Dynamics: challenges for sustainability in water and sanitation |

For more STEPS Centre publications visit:

www.steps-centre.org/publications

This is one of a series of Working Papers from the STEPS Centre

www.steps-centre.org.

ISBN: 978-1-78118-083-9

**Price £5.00**



IDS Institute of Development Studies

US University of Sussex SPRU – Science & Technology Policy Research

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

# The Politics of Agricultural Carbon Finance: The Case of the Kenya Agricultural Carbon Project

**Joanes O. Atela**

Correct citation: Atela, J.O. (2012) *The Politics of Agricultural Carbon Finance: The Case of the Kenya Agricultural Carbon Project,* STEPS Working Paper 49, Brighton: STEPS Centre

ISBN: 978-1-78118-083-9

First published in 2012


Acknowledgements:
At the Institute of Development Studies at the University of Sussex, the Future Agricultures Consortium and the 'political ecologies of carbon in Africa' project of the ESRC STEPS Centre both provided institutional and intellectual support for this study. Specifically, Professor Ian Scoones, Professor Melissa Leach and Dr Lars Otto Naess all from the IDS, mentored this fellowship. In Kenya, the NEPAD Kenya Secretariat provided institutional support for the fellowship. Particular gratitude goes to the NEPAD Kenya CEO Mrs. Lillian Omollo Mbogo and her deputy Mr. Ismail Abdirahman who supported this work as a relevant initiative to the Secretariat's programmes. The staff of the Kenya Agricultural Carbon Project assisted with access to field sites and farmers for interviews. The kindness and responsiveness of farmers working with the project is sincerely appreciated.

Design by Wave (www.wave.coop), Barney Haward and Lance Bellers.

For further information please contact: STEPS Centre, University of Sussex, Brighton BN1 9RE
Tel: +44 (0) 1273915673
Email: steps-centre@ids.ac.uk
Web: www.steps-centre.org



# LIST OF ABBREVIATIONS

| | |
|---|---|
| ASDS: | Agricultural Sector Development Strategy |
| CAADP: | Comprehensive Africa Agricultural Development Programme |
| CCAFS: | Climate Change Agriculture and Food Security Research |
| CGIAR: | Consultative Group on International Agricultural Research |
| ESIA | Environmental and Social Impact Assessment |
| ICRAF: | World Agro-forestry Centre |
| IFPRI: | International Food Policy Research Institute |
| IPCC: | Intergovernmental Panel on Climate Change |
| KACP: | Kenya Agricultural Carbon Project |
| KARI: | Kenya Agricultural Research Institute |
| MRV: | Monitoring, Reporting, and Verification |
| NAMAs: | Nationally Appropriate Mitigation Actions |
| NEMA | National Environment Management Authority |
| NEPAD: | New Partnership for Africa's Development |
| NEPAD: | The New Partnership For Africa's Development |
| PPA: | Policy Process Analytical framework |
| REDD: | Reducing Emissions from Deforestation and Forest Degradation |
| SALM: | Sustainable Agricultural Land Management |
| SBSTA: | Subsidiary Body for Scientific and Technical Advice |
| SCC-ViA: | Swedish Cooperative Centre - Vi Agro-forestry Program |
| UNDP: | United Nations Development Programme |
| UNEP: | United Nations Environment Program |
| UNFCCC: | United Nations Framework Convention on Climate Change |

# TABLE OF CONTENTS

# 1. INTRODUCTION

## Background

In the negotiations for a post Kyoto climate agreement, Sub-Saharan African countries are engaging in policy processes and demonstration projects around land-use based carbon finance (Bond et al, 2009). Agricultural mitigation and Reduced Emissions from Deforestation and Forest Degradation (REDD) are the land use initiatives that dominate international and national policies, agendas and debates, attracting disproportionate political interest and status. REDD in particular has received UNFCCC recognition, (UNFCCC, 2008b), as a cost-effective way to reduce greenhouse gases and increase forest value in developing countries (Stern, 2006; ETFRN, 2008). The recognition of REDD has since been seen by some actors as a window of opportunity to push for climate smart agriculture that embraces agricultural carbon finance (Negra and Wollenberg, 2011). Agricultural carbon finance involves payment received from international donor/aid agencies, private and public sectors and charity organizations mainly in developed countries as a compensation for Sustainable Agricultural Land Management (SALM) practices that capture and store greenhouse gases – or carbon-dioxide equivalents (see Seeberg-Elverfeldt, 2010). Policies for agricultural carbon finance are still under negotiation globally and nationally, and are subject to a number of operational hurdles and conflicting interests (cf Beddington et al, 2012).

In the context of these negotiations, agencies including the UN organizations, the World Bank and agricultural research organizations have set up a variety of programmes and funds to demonstrate how agricultural carbon finance can work and produce multiple benefits. The Kenya Agricultural Carbon Project (KACP) is among the first of such initiatives in sub-Saharan Africa (World Bank, 2008; 2010b). The project is supported under the World Bank BioCarbon Fund (BioCF) and has worked with groups of smallholders in western Kenya since 2008. KACP and related initiatives are expected to generate lessons for global and national policies for agriculture in the face of climate change. Indeed many studies have examined and supported the logics of such initiatives (e.g. Seeberg-Elverfeldt, 2010; World Bank, 2010b; 2011; Moorhead, 2009), explored their regional distributions (e.g. Jindal et al, 2008; Shames and Scherr et al, 2010) and outlined associated opportunities and challenges (Seeberg-Elverfeldt, 2010; Woelcke, 2012; Woelcke, 2011; Woelcke and Tennigkeit, 2011). However, other studies, (e.g. Stabinsky, 2011; Sharma and Suppan, 2011), have labelled the benefits of KACP and similar initiatives as elusive and uncertain.

These research efforts are important. Nevertheless, a question that bothers me as a native of sub-Saharan Africa who has spent the better part of his life in an agricultural household is: what actual policy lessons can be generated from these early projects if their interplay with significant, historical local and national realities is not addressed? And why has research been so silent on how this interplay structures decisions, so as to influence actual outcomes on the ground? These are overarching issues that remain unclear (see Corbera and Schroeder, 2011), and are often side-lined in project and policy development and evaluation because they are considered 'sensitive' - as they are conditioned by differing interests. This study attempts to tell this untold story by unpacking the policy process in a particular agricultural carbon finance project, and exploring its interplay with national and local histories, socio-cultural contexts and interventions. This evidence and analysis may prove useful for building more realistic efforts towards climate justice for agricultural communities, but may also highlight and generate controversy, exposing the extent to which agricultural finance projects are inevitably political.

This study clarifies: (1) the convergence and/or divergence of the narratives held by different actors about the initiative; (2) how these narratives inform the approach used in engaging farmers;

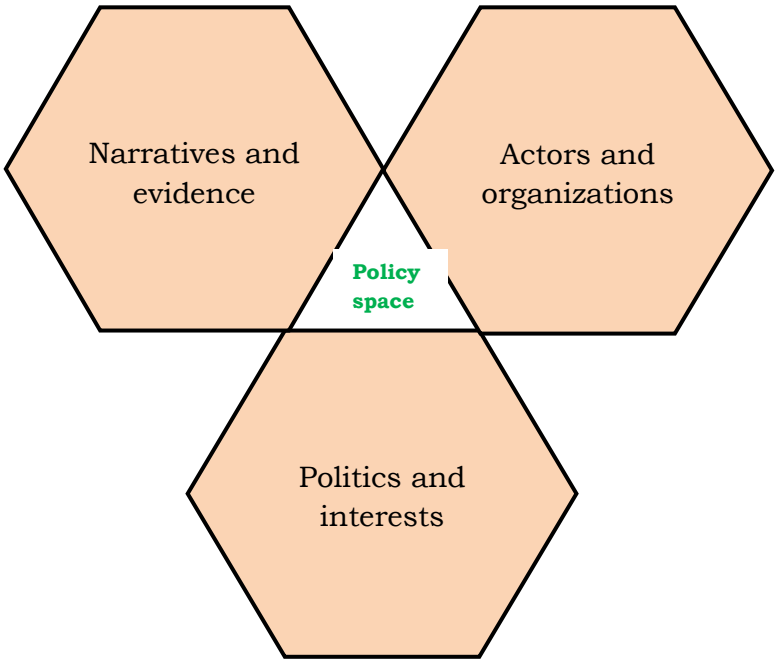
(3) how different people think about and justify the project, and (4) the interactive impacts of the project on access and ownership of associated resources, including impacts on livelihoods and ecologies. The analysis focuses on the Kenya Agricultural Carbon Project to unpack empirically the policy process in and around it. The policy process analytical framework of Keeley and Scoones (2003) guided the analysis of primary data collected through transect walks, discussions and interviews with farmers and project staff, participant observation, expert consultations and content analysis of key policy documents.

The paper consists of six sections. Alongside this introduction, the policy process analytical framework and data collection methods are discussed as section one. Section two describes the case study project and the associated historical and socio-economic context within which it is implemented. Section three begins to explore the diverse narratives around the project. It examines how narratives at higher – global and regional - levels have developed, drawing particularly on evolving scientific knowledge generated by international research institutions working closely with donor agencies, and how these narratives compare, contrast and intersect with the narratives of Kenyan state actors and farmers. Notably, there is a divergence between current scientific-donor narratives and the narratives of farmers which focus on good farming practices for improved maize production; a divergence structured by earlier agricultural policies and the top-down projectization of recent interventions which limits informed engagements. The fourth section shows how powerful global and project narratives shape the approach used in project implementation and carbon accounting on the ground, conditioned by differing actor coalitions and interests. These interests easily override underlying limiting factors such as weak land tenure systems, water scarcity, illiteracy and gender imbalances. Section five shows how the resulting project implementation process, associated with the interplay between narratives and actor-networks, structures power relations and re-distributes resource rights and benefits. Conclusions and implications – including what opportunities and policy spaces exist for improving the conception, design and implementation of agricultural carbon finance projects are highlighted in section six.

## Analytical approach

The conceptual design and impacts of the Kenya Agricultural Carbon Project (KACP) were analysed using the policy process analytical framework, (Fig 1.1), of Keeley and Scoones (2003). This framework combines analysis of narratives/discourses, actors/networks, and politics/interests and was developed based on case studies of environmental policy-making processes in Africa (Keeley and Scoones, 2003). It has been applied in a number of climate change-related projects (see Naess et al, 2011). The framework is particularly useful in highlighting interests and power relations in environmental policy processes. Power relations, in recent times, have been proven to significantly shape policy processes and outcomes (Clement 2010). For this study, the policy process framework was preferred to alternative frameworks like Institutional Analysis and Development (IAD) (Ostrom et al, 1994). The Institutional Analysis and Development framework analyses only institutional arrangements (Koontz 2003), useful in simplifying the often messy processes involved in policy, but without detailing the interests and power relations shaping these processes. The policy process framework used here acknowledges how interests and politics shape power relations, and how these relate to the politics of resource access and use.

**Figure 1.1 The policy process analytical framework; Adapted from Keeley and Scoones (2003)**




Narratives are storylines that help identify competing ways of viewing a particular policy problem. These stories describe events, or define the world in certain ways, and so shape policy decisions, thereby providing both a diagnosis and a set of measures and interventions (Wolmer et al, 2006). Since policy problems can be defined in a number of ways, dominant narratives e.g. 'tragedy of the commons' (Hardin, 1968) have more bearing on policy decisions than others. Narratives which frame the problems in different ways from those more commonly known are referred to as alternative narratives (Keeley and Scoones, 2003).

The actor component of the framework helps to identify how different people and institutions come together to promote certain narratives and define the ways in which they are understood in society. The establishment of actor-networks subsequently establishes and legitimises certain forms of knowledge and belief (Keeley and Scoones, 2003). As such, the strength of scientific fact is determined by the strength of the actor-network that upholds it and if key actors withdraw their support for the facts, the science becomes weak (Keeley and Scoones, 2003). The actor-networks aid in understanding how key decisions find their way into the policy process. Based on the framework, the paper first analyses the broader narratives of agricultural carbon finance, then proceeds to describe processes in what I term the 'action arena' where these narratives inform various actors, institutions and resource interests. These intersect with socio-economic and cultural conditions in the project area to produce policy relevant outcomes. Overall, by examining the three attributes (narratives, actors/networks and politics/interests) emphasised in the policy process framework, it becomes possible to understand and identify policy spaces to contribute to improved conceptualization and design of agricultural carbon finance in smallholder settings.

## Methods

Table 1.1 summarises the methods used to collect primary information from different sources (also see Figures 1.2, 1.3 and 1.4). Methods combined interviews and group discussions with the use of a range of ethnographic and participatpry research methods, and document analysis. These were applied in different ways with four main groups of actors/perspectives: farmers/communities; the project; national/government, and wider global.

### Table 1.1 Methodology matrix

| | Interviews, oral histories and informal chats | Focussed group | Key informants | Document analysis |
|---|---|---|---|---|
| Farmers/local community | ✓ 43 individual farmers<br>✓ 4 community resource persons | ✓ 1 youth group 'D'<br>✓ 2 discussion with ABMS farmers<br>✓ 4 farmer groups' A' 'B' 'C'<br>✓ 1 non-project group 'E' | ✓ 3 village elders<br>✓ 2 provincial administration<br>✓ 1 community resource person | ✓ Group rules and regulations<br>✓ Group constitutions and activities<br>✓ Group membership |
| The project | ✓ 3 extension staff<br>✓ 3 management staff | - | ✓ 1 project management | ✓ Project Design document<br>✓ Progress reports<br>✓ Safeguard documents<br>✓ Farmer commitments and evaluation protocols |
| Government | ✓ 1 staff Ministry of agriculture<br>✓ 1 Kenya Agricultural research institute | - | ✓ 1 staff of the Agriculture Sector Coordination Unit | ✓ Government climate and agriculture policy documents<br>✓ The Kenyan constitution<br>✓ African Peer Review Mechanism report<br>✓ CAADP documents |
| Global | - | - | ✓ 1 consultant for the CAADP/NEPAD climate smart agriculture framework | ✓ Policy documents; world bank, FAO, UNFCCC COPs<br>✓ CGIAR's scientific reports and policy briefs<br>✓ Peer reviewed and technical series articles on political ecologies/economies of carbon finance |
| Total | **55** | **6** | **9** | **87 references** |

**Figure 1.2 Community members during focused group discussion, Wagai division, Siaya County; August 2011**

**Figure 1.3 Transect walk along the project area**

**Figure 1.4 Discussion with farmers at the site where they implement project activities**

Farmers were sampled based on age, gender, literacy, position in the community and role in the case project. Information was analysed qualitatively using grounded theory approach, excel graphics and flow charts to draw out narratives, actor-networks and interests, and locate these in historical and ongoing intervention processes.

# 2. THE KENYA AGRICULTURAL CARBON PROJECT-KACP

**Description of the project**

During the 2010 Hague Conference on agriculture, food security and climate change, the Swedish Cooperative Centre - Vi Agro-forestry Program (SCC-ViA), the Kenyan Government and the World Bank signed the Emission Reduction Purchase Agreement (ERPA) to reinforce KACP, an initiative that had begun two years earlier (World Bank, 2010a). KACP was commissioned in 2008 and is the first World Bank-supported demonstration of carbon financing for smallholders in Africa:

> 'Triple Win of Climate-Smart Agriculture put into Practice: Africa's first agricultural soil carbon project changes Kenyan lives:Tom Odhiambo and Maurice Kwadha are small-scale farmers in western Kenya, and they understand all too well the impact of climate change on their local environment and food production. On just one acre of land inherited from his father, Tom and his wife Mary practice improved agricultural practices, which have enabled them to increase yields and make more money than other smallholder farmers in this hot and dry environment' [World Bank News and Events, 8 March 2011[1]].

The Swedish International Development Agency funds 38% of the project costs while the implementing agency - SCC-ViA - contributes 32% of the costs. As part of the farmers' contribution, about 30% of the eventual carbon revenue will be used to fund the remaining costs. The World Bank's BioCF on the other hand has committed to purchase initial carbon credits generated from the project (KACP**,** 2008:15). The SCC-ViA, a Swedish nongovernmental organization (NGO) has worked with farmers in this area for more than two decades, and had identified severe land degradation harming food security and Lake Victoria's ecosystems as major challenges (KACP, 2008; KACP, 2010). The SCC-ViA therefore aimed to build on this long-term agro-forestry related work in the area to further train about 60,000 smallholders owning 45,000 ha of land in the new carbon project. The agricultural practices supported under the project include agro-forestry, residue management, cover cropping, tillage and manure management. These practices are designed in line with IPCC guidelines on agriculture (IPCC, 2006; Bird, 2012) and are expected to replenish soil organic carbon (SOC) as part of delivering multiple benefits:

> '[...] these farmers have adopted new farming techniques and as a result are benefiting from a triple win in agriculture. They are getting higher yields, improving the resilience of their crops to drought and creating stronger soils that sequester more carbon' [Andrew Steer, Special Envoy on Climate Change, The World Bank in World Bank News and Events updated on 8 March, 2011].

At the beginning of KACP, farmers signed 'farmer commitment forms' (see appendix 1) as a commitment to participate in the project. The commitments were made through existing farmer groups that signed contracts with SCC-ViA. In the forms, farmers undertake to implement project

[1] http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTSDNET/0,,contentMDK:22842518~menuPK:64885113~pagePK:7278667~piPK:64911824~theSitePK:5929282,00.html

activities in their farms. Accounting for the carbon from these activities is guided by the approved Voluntary Carbon Standard methodology. The methodology combines the Roth-C model with Activity Baseline Monitoring Survey (ABMS) to guide the accounting and monitor other practices (Bird, 2012). The project is expected to generate 1.37tons of $CO_2$ /ha per year, mainly from increased soil carbon (Woelcke and Tennigkeit, 2011).This means that about 1.23 million tons of $CO_2$ is expected from the 45,000 ha over the 20 year project period (KACP, 2010). However, 60% of the credits will be discounted as part of uncertainties (Wekesa, 2010; Woelcke, 2011)[2]. The first credits will be sold to the World Bank and extra ones could be sold to other buyers (World Bank, 2010b).

Given that farmers in the KACP area had been exposed to the farming technologies that the project currently promotes, payments for carbon captured from these activities is, to many practitioners, the unique idea of the project and of course the interest of national, regional and global research and policy processes. The project is currently informing a climate smart agriculture programme in Kenya's Agricultural Ministry[3] and the entrenchment of climate change policies in the Comprehensive Africa Agricultural Development Programme-CAADP (African Union, 2011). The African Union established CAADP in 2003 specifically to achieve at least 6% annual increase in agricultural productivity in the member countries. To achieve this, African governments including Kenya committed to invest at least 10% of national budgets in agriculture (CAADP, 2009).

**Socio-ecological context of the project area**

KACP is implemented in Kisumu, Siaya and Bungoma districts of western Kenya. However, during fieldwork for this research, the project's activities were especially active in Siaya district - currently administerd as Siaya County according to Kenya's new Constitution (Republic of Kenya, 2010a). Siaya County, arguably, had better farmer engagement structures informed by the KACP implementors and many prior projects[4]. Primary data was therefore collected from the project sites concentrated in Wagai division (Fig 2.1) of Siaya County.

Siaya County has a quasi-equatorial climate dependent upon the Lake Victoria ecosystem (Nyaoro, 2001:42). Sitting between 1400m and 1140m above sea level, mean annual rainfall in the area follows this altitudanal sequence at 2000 mm at the highest and 1000mm at the lowest elevation. The area has a minimum temperature of 17$^{o}$C and a maximum of 30$^{o}$C with significant altitudinal influence as well (Nyaoro, 2001).

The County is inhabited by the Luo ethnic group - the fourth largest in Kenya (Kenya National Bureau of Statistics, 2009), where social life revolves around predominantly male-headed households[5]. Within a household, the eldest son is entrusted to take on the family leadership and resources to extend the family lineage. Specifically, sons have the exclusive rights to inherit land from their fathers. Luo men can marry one or more wives and construct houses for them in a compound referred to as *dala* (Fig 2.2; homestead). A group of homesteads originating from a particular lineage forms a social unit called *Anyuola* (clan), while a group of *Anyuola* forms a *Gweng* (village) in which elderly men take responsibility for reinforcing community norms and rules[6].

[2]Discussion with KACP staff , Kisumu, August 2011

[3] Discussion with Ministry of Agriculture staff, Nairobi, December, 2011

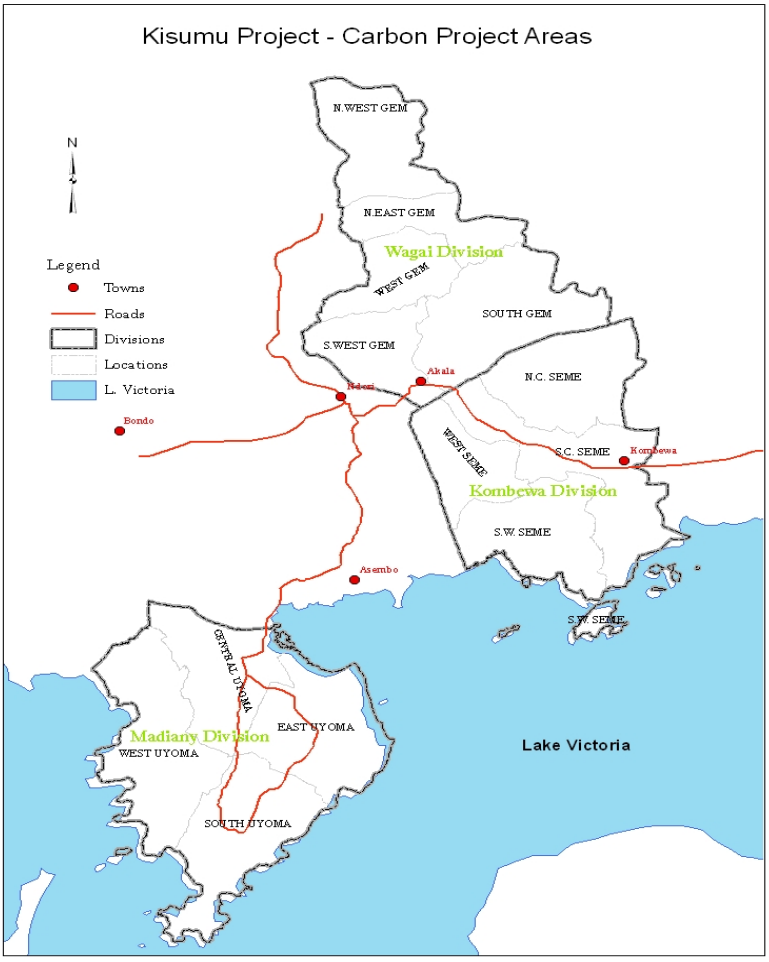
[4] Interview with extension staff, Wagai, August 2011

[5]Household interview, Wagai, July 2011 and Personal analysis

[6]Interview with a village elder in West Gem location, Wagai, August 2011

Within the village set up, formal governance units such as sub-locations and locations headed by the Chiefs or assistant Chiefs exist as a link to the central government.

**Figure 2.1 Location of the Kenya Agricultural Carbon Project sites in Nyanza province. The project works in selcted divisions within adistrict. Madiany division belongs to Bondo district, Kombewa division belongs to Kisumu district while Wagai division belongs to Siaya district. Data collection concentrated in Wagai division of Siaya district. Modified from KACP (2010 pp 24)**




Siaya County has 35% of its population living below 1.25 US$ per day and is ranked 10th among 47 Counties of Kenya in poverty levels thus is among the poorest areas in Kenya (Republic of Kenya, 2012b). The relatively high poverty level has attracted a number of donor funded agencies and charity organizations that work with the communities in the context of poverty alleviation and environmental conservation. Households in the area own an average of 1.03 ha which they almost entirely (98%) use to grow food crops - mainly maize, beans, sweet potatoes and millet - in a rain-fed system[7]. This rain-fed farming is the main source of food and a source of employment for

[7]Interview with individual household, August 2011

about 60% of the residents who provide farm based labour to their neighbours (Republic of Kenya, 2008). Water is a major problem in the County both in terms of access and quality. A large proportion of the population depends either on the wetlands and runoffs from River Yala that drain into Lake Victoria or on dams constructed by charity organizations (Republic of Kenya, 2012b; Nyaoro, 2001). For those who live far from the river, accessing water is a challenge. During dry spells, people here - mainly women - walk long distances, sometimes up to 4km, in search of potable water[8]. Some additional socio-economic features are presented in Table 2.1.

**Figure 2.2 a typical homestead (dala) in Siaya County with one or more houses belonging to one or more wives distributed in the compound. Some local livestock would be observed grazing freely and it is a common thing to find maize grains spread outside to dry by the sun. Source: Republic of Kenya, 2009**

**Table 2.1 Socio-economic features of Siaya County**

| Socioeconomic attribute | Measure |
|---|---|
| Population[1] | 842, 304 |
| Population density | 333 |
| % households with primary education | 70.3% |
| % of households with secondary education | 10.8 |
| % of household with access to improved water | 46.7 |

Source: Siaya District Development Plan for 2008-2012 (Republic of Kenya, 2008)

In the above socio-economic context, the KACP integrates smallholder farmers into a new scheme and set of activities designed to demonstrate the achievement of agricultural carbon finance. But how is the interplay evolving? The next section analyses how narratives that inform the KACP at global negotiations converge with or diverge from the narratives emerging from this socio-economic context, and broader national policies.

[8] Interview with the chief of West Gem, Wagai, August 2011

# 3. FRAMING AGRICULTURAL CARBON FINANCE

## A brief history of carbon finance

First, before presenting the narratives, it is useful to understand the broader historical context of carbon finance. This context is the emergence of concepts, opportunities and metrics for carbon finance. The origin of carbon finance is found in the Kyoto Protocol to the Climate Convention (UNFCCC). The Protocol entered into force on 16 February, 2005 and commits industrialized countries (Annex I parties) to reduce greenhouse gas emissions-carbon dioxide equivalents by 5.2% below 1990 levels during the 2008-2012 commitment period (UNFCCC, 1998). Specifically, developed countries have the option of financing Clean Development Mechanism (CDM) projects in developing countries (Annex II parties) to offset and meet part of their emission targets (Stuart et al, 2003). In the CDM, the crucial role of agriculture in climate change was not emphasised. Initially, much of the scientific evidence revolved around fossil fuels as the main source of greenhouse gases (GHG) causing climate change. Mitigation responses therefore largely occurred in the energy sector. In practice, many African countries were excluded from the CDM due to the scheme's bureaucratic, technical and resource demands (Pearson et al, 2006). These hurdles nonetheless provided lessons to trigger the emergence of alternative platforms around voluntary carbon exchange, especially in the forestry and agriculture sectors. A number of voluntary schemes exist and are now recognised within the UNFCCC process. They carry their own particular protocols and requirements. Yet their non-binding attributes mean that actors who were otherwise excluded in the CDM could be involved. Assessment of the status of carbon markets shows that there has been a great increase in the number of forestry and agriculture-related credits traded in the voluntary market since the Kyoto Protocol entered into force in 2008 (Diaz, 2011). In the search for a post Kyoto climate agreement, the role of agriculture as both cause and victim of climate change in the context of deforestation has become clearer. Demonstration projects such as the KACP are a product of this revelation and are aimed at informing a lobby for the inclusion of agriculture in the expected agreement. A number of narratives informing these interventions at global, project, national and local levels are discussed in the next sub-sections.

## Global narratives : agriculture in REDD

A lobby for the inclusion of agricultural mitigation alongside REDD started soon after the 2007 Bali Action Plan that appeared to legitimize negotiations on land use practices in the realm of REDD (UNFCCC, 2008b). This lobby takes its starting point from a recognition of climate-related agricultural issues, and a political opportunity presented in the REDD debate. Contested issues such as the rights of local communities in REDD (see Corbera and Schroeder, 2011; Schroeder, 2010; Sikor et al, 2010; UNFCCC, 2009) have been taken up by agriculture-focused actors to strengthen the narrative of agriculture in REDD. It is argued that since most local communities around forests are agriculturalists, then REDD cannot function without linkages to agriculture. The actors putting forward the narrative are drawn from the UN agencies, international aid agencies and a range of forest community alliances e.g Forest and the People, Forest Community and Livelihoods, as well as some governments in non-forested countries. International agricultural research organizations such as ICRAF and Partnership for Tropical Forest Margins are also part of this network, with their work contributing to the scientific reinforcement of the narrative. Specific research programmes such as Climate Change Agriculture and Food Security (CCAFS), a ten year CGIAR challenge programme, have been established along these lines. The programmes have produced a stream of scientific information on the synergies between agriculture and forests and drawn policy recommendations as to how to utilize the synergy in international climate policy processes. For instance CCAFS commissioned a report, (Moorhead, 2009), to highlight the

importance of agriculture in relation to climate change adaptation and mitigation and to provide input to the Agriculture and Rural Development Days and the Forest Days at the recent Conference of Parties to the Climate Convention as the report puts it:

> 'Indeed, climate change provides a massive and urgent incentive to intensify efforts to disseminate the fruits of this research and to continue developing adaptation and mitigation options' [Moorhead, 2009: 2].

A common argument in a number of articles scoped from these research programmes (see Scherr et al, 2010; Minang et al, 2011; Rodel et al, 2010; Zomer et al, 2009; van Noordwijk et al, 2010; Fischler 2009; Smukler and Palm 2009; Moorhead, 2009; Negra and Wollenberg, 2011) is that that successful REDD depends more on agricultural development strategies that retain and sustain forests than on forestry strategies themselves. These articles advocate policies that consider agroforestry as a means to curb deforestation and prevent forest degradation through increased production of on-farm timber and fuel wood in areas where access to forests is restricted, suggesting that these would enhance synergies between mitigation and adaptation (see Minang et al, 2011). A working paper from the Tropical forest margins shows about 46% of global agricultural land, especially those around forests, to have 10% tree cover. The proportion of on-farm tree cover can be argued to fall in the range of forest reference under the Kyoto protocol-threshold canopy cover of 10–30% and tree height of two to five meters (UNFCCC, 2008a). A related argument is that agriculture itself has climate change mitigation potential. Thus the IPCC (2007) argues that farming has a mitigation potential of 5.5-6 Gt $CO_2$e per year especially from soil carbon sequestration. FAO (2008) argues further that the improved agricultural management practices recommended for mitigation under the Kyoto Protocol are often the same as those needed to increase productivity, food security and adaptation. In its submission to the COP 15 in Copenhagen, FAO advocated for a political deal that would entrench agriculture as a means to cost-effective mitigation by capturing synergies with adaptation and food security (FAO, 2008).

Informed by the research and donor lobby, COP 16 in Cancun (see UNFCCC, 2012) mandated the Subsidiary Body for Scientific and Technological Advice (SBSTA)[9] to prepare a Work Programme for agriculture. In the following meeting - COP 17 in Durban - eight Aid agencies, ten international agricultural research organizations and seven farmer advocacy groups relayed a passionate version of the triple win narrative in a letter entitled 'Agriculture: A Call to Action for COP17 Climate Change Negotiators' 10. They specifically requested negotiators to recognise the important role of agriculture in addressing climate change and asked them to approve a Work Programme for agriculture under the SBSTA for early action on agriculture to meet future challenges. However, the work programme was not established in Durban and will be discussed further in the COP 18 scheduled for Qatar in December, 2012 (Beddington et al, 2012).Some of the messages relayed during the Cancun and Durban talks were as follows;

> 'The fate of forests and agriculture are bound together. Forests cannot be sustained if people are hungry or the governance of natural resources is inadequate.... The Bank will convene a high-level event on climate-smart agriculture on December 7 to make agriculture part of the solution to climate change rather than a contributor to greenhouse gas emissions and deforestation'. [Rachel Kyte, Vice President for Sustainable Development, World Bank, Forest Day 5 Plenary session, Durban, November 2011].

[9] SBSTA was formed by the COP of the UNFCCC to synthesise expert knowledge and the IPCC science, including technological and methodological matters for the negotiators ( http://unfccc.int/bodies/body/6399.php)
10 See letter at www.agriculturedday.org/openletter

> 'Ideas do not feed people but climate-smart practices in the hands of farmers can. Governments no longer have to choose between feeding people and protecting the environment. Now, it's possible to do both.' [Kanayo Nwanze, President of the International Fund for Agricultural Development (IFAD), Durban, November 2011].

To establish a common policy position, the concept of climate smart agriculture emerged (see CCAFS, 2009). Climate smart agriculture has gained more political and donor attention in the negotiations in the context of REDD, (see AU, 2011). According to the dominant narrative, it involves agricultural practices that sustainably increase productivity (food security), improve resilience to climate change (adaptation) and reduce/removes GHGs (mitigation) for payment (World Bank, 2010; 2011; FAO, 2011). This is also referred to as 'triple wins'.The World Bank BioCarbon fund (Wallenberg and Negra, 2011) and the FAO led Mitigation Climate Change Agriculture Programme, (MICCA) (FAO, 2011; Seeberg-Elverfeldt, 2010), support climate smart agricultural projects. As mentioned earlier, the World Bank BioCF currently supports the Kenya Agricultural Carbon Project.

> 'BioCF wants to buy "green carbon" with a human face… i.e improves livelihoods' [Presentation at the BioCF Project Training Seminar, slide No 5, Washington, DC; July 13 2005].

**Project narratives : climate smart agriculture and triple wins**

The Kenya Agricultural Carbon Project (KACP) draws its core narrative from the global narrative that established climate smart agriculture as a lobby tool. The KACP design document and staff emphasise 'triple wins' as both a justification for and as the expected outputs of the project. The narrative argues that land in western Kenya, in the absence of the project, will continue to suffer pressure from agriculture resulting in degradation and poor crop yields. This degradation will further affect the Lake Victoria ecosystems which serve many people:
'The most likely scenario in the absence of the project will be driven by two dependent issues: The traditional fallowing or shifting cultivation system which is heavily based on nutrient and carbon cycling has declined and will further decline due to rapid depletion of per capita arable land (population density in the project region: approx. 400 pers./sqkm)……As a consequence of this, the soils will further degrade leading to stagnating yield production and critical food insecurities respectively' [KACP Project Design Document, 2008: 10].

> 'Based on the fact that Lake Victoria ecosystem is an important wetland which supports many people in the region, the project site is appropriate for this project. Therefore the project will not only achieve its objectives of climate change mitigation, and increase farm productivity but also restore degraded areas of Lake Victoria catchment' [KACP Environmental and Social Impact Assessment Report 2010:16].

> 'Most farmers in the project area are smallholders. Their farming systems are vulnerable thus needs to be climate resilient for increased production of staple food mainly maize and bean. This carbon project has the potential to assist this situation' [KACP staff, Kisumu, August 2011].

But what are the specific relationships between this narrative and the global narrative? Firstly the above concerns are echoed in the World Bank's (2011) document which emphasises that agriculture, especially in sub-Saharan Africa, must undergo a significant transformation in order to

meet the related challenges of food security and climate change. This transformation is represented in the supposed triple win agenda of climate smart agriculture (World Bank, 2011).

Secondly, land management technologies for western Kenya are largely a product of international science. In more than two decades, ICRAF has supported land management technologies in western Kenya (see Place et al, 2006). It is these technologies which are currently being re-packaged and pursued by the KACP as part of 'triple wins'. Thirdly, in the context of international influence, the project donor reinforced the 'triple wins' narrative through the assignment of roles in project design and implementation. The project sponsor appointed consultants who were technically responsible for the project design and monitoring procedures[11], which was therefore expected to conform to the global narratives associated with the project sponsor's networks. The project's activities are therefore technically designed and monitored in line with the global push for agriculture in REDD. The procedures largely borrow from the UNFCCC's documented guidelines[12]. The application of these protocols is a requirement for project approval under the Voluntary Carbon Standard but could also be aimed at demonstrating for UNFCCC negotiators the possibility of standardised operational approaches in agriculture. In the recent UNFCCC talks, REDD proponents were reportedly concerned about the technical challenges and transaction costs associated with monitoring peasants' plots (see Beddington et al, 2012).

The early experiences of the KACP are indicative of a well-established donor-science network dominating the project's design and monitoring. Project staff - at management level - are also drawn into this nexus. In discussing the project's justification, the staff reinforced their argument by drawing specifically on the World Development Report of 2008 that argues that smallholders and pastoralists will feed the world, justifying their need for climate resilient interventions such as the KACP:

> 'If you read the World Development Report of 2008 and the World Bank Biocarbon fund documents, you will find that the future of food security lies on small-scale farmers and the pastoralists. With climate change, they need climate resilient agriculture and this is what the project intends to address'. [KACP staff, Kisumu, August 2011].

The World Development Report is a World Bank commissioned public report on development issues. The 2008 report focused on 'Agriculture for Development' (World Bank, 2008). The KACP management trains extension staff on the triple wins idea during seminars which sometimes draws in collaborating institutions. The extension staff have thus become part of the network promoting the 'triple wins' narrative, but probably with less ownership as reflected in the following statement: 'we work with community resource persons to implement what the officers have developed'[13] . Nonetheless these extensionists are expected to carry the narrative along to farmers.

**Farmers' narratives: good farming practice for increased maize production**

It is important to understand how the donor-science driven narrative interplays with farmers' understandings and aspirations. In general, farmers' understanding of the KACP is fairly narrow. They are primarily interested in boosting production and achieving food security.[14] The first 'win' for them is therefore the most important. As such, most farmers working under the KACP

[11] Discussion with KACP staff, Kisumu, August 2011

[12] See appendix 4 of project design document (KACP, 2010:23)

[13] Interview with KACP extension staff, Wagai, August 2011

[14] Interview and informal discussions with individual farmers, Wagai, August 2011

understand the project as providing a solution to low yields of food crops, especially maize and beans:

> 'I was in my group, and then we got a resource person who informed us about the project. They said the project will help us with farming and so I engaged in the project because it will help me with new ways of farming that will give me good yield. The project officers also came later and told us that some money could be given to us and so I think it is good for us. [Female farmer, Wagai, August 2011].

A male farmer in Siaya County had just begun engaging in the project activities. When asked why he was interested in the project, he stated:

> 'I have been following up the project through community resource persons. I want to engage with the project because it provides skills for new land use practices and be able to get the 5 bags of maize I used to get from my land when I moved to this area years ago' [Male farmer , Wagai, August 2011].

When asked why he was not part of the project from the beginning, he explained:

> 'The communication was not clear at first and information was only shared to those who were willing. Most people in my area did not understand the project well…but since I have seen that other farmers are given tree seedlings, I now want to be involved and plant a lot of trees from the seedlings they provide so that I can sell later and get money even if the project doesn't give me anything'.

However, this narrative of good farming practice does not link well to farmers' experience of reduced yields due to unreliable rainfall. Unreliable rainfall due to climate change is reportedly a result of wider global actions in the energy and forest sector, (IPCC, 2007), and cannot be addressed explicitly through soil fertility replenishment in a small scale setting. Yet when asked about the actual problems they face with farming and why they justify the KACP as a solution, most farmers talk about the influence of changing rainfall on their cropping patterns:

> 'Climate change is lack of rainfall because people have cut down forests. We can no-longer plant in February or March. The rains only come in May and even after waiting, the rains come in huge amounts and sweep away our crops. The agroforestry project trained us on best ways to do farming and we hope it will help us with this problem' [Female farmer working with KACP, August 2011]

> 'Our teacher (community resource person) told us that because maize yields have dropped we should continue planting more trees under agroforestry people. We were then given tree seedlings which she showed us how to plant in our farms. She also told us that the world is bad due to climate change and if we plant many trees, we shall get rainfall' [Female farmer during focused group discussion, Wagai, August 2011].

> 'Many people planted maize in these fields but it did not do well. If you came earlier, you would have seen how short the plants looked because of poor rains. When the rains come in good time, the crops do well and I am able to get enough to feed my family for a longer time. Also when the rain is there, many people plant two times in a year first in February and then in August after the first harvest. However, now we only plant when rains fall but you can't know when'. [Community resource person during a transect walk, Wagai, August 2011].

The statements above indicate that most rain-fed farmers in the KACP area are well aware that variable rainfall can dramatically affect productivity and food security. Any project that purports to address such issues, however obliquely, is regarded positively. Farmers seem to have interpreted project communications around climate change to suggest that tree-planting will solve rainfall problems. However for the most part, farmers' narratives focus on 'good farming practices for increased production of staple food'.

**Figure 3.1 a recently released maize seed from the Kenya Agricultural Research Institute (KARI). The seed is said to be tolerant to drought and weeds.**


This is a new incarnation of a historically-embedded narrative. With maize being the dominant crop, farmers have long been exposed to new technologies that improve production, whether new seeds or improved fertilizers (see Fig 3.1). Through numerous interventions from government, aid projects and NGOs, farmers in this area have been made to understand that a 'good farmer' is one who implements 'good' farming practices (ie. those introduced by external interventions) and gets high crop yields with stores always full of maize. In recent years, a range of externally-funded projects have promoted a variety of additional practices for improving production. In this area, ICRAF and NGOs such as SCC-ViA have promoted improved fallows, biomass transfer and alley cropping disseminated through contact farmer[15] and demonstration approaches. During public gatherings, such as Chief's barazas, 'good farmers' are conferred prestige by being highlighted as examples[16]. Since these 'good farmers' grow a lot of maize through adopting 'good' farming practices, the rest follow. In this established set of narratives and practices, there is little or no consideration of other elements such as the carbon stocks and payments associated with a project such as the KACP. The KACP has thus found it daunting to create a view that brings into account the element of carbon finance. In any case, the KACP promotes the same sustainable land management practices that were championed by others, and farmers see little difference:

> 'The project came from the umbrella CBO (WIFAP) which is well connected and have been working with previous projects. I am a member of WIFAP and have worked with most projects coming into this area to help farmers. I was selected to work under the KACP because my groups worked with projects such as ICRAF, KARI-WKIEMP, and SCC-ViA to plant trees. However, I am getting difficulties in training farmers under KACP because ICRAF paid

[15] See next section for the dissemination approaches the project uses

[16] Focus group discussion with farmer group 'A', Wagai, August 2011

some farmers to be part of demonstration of biomass transfer and agroforestry practices. They also provided farmers with food for work at the beginning which KACP has not done'. [Community resource person, Wagai, August 2011].

The KACP is thus seen by most farmers as another project in a long line, offering a solution to boosting maize productivity. Ideas of 'triple wins' and 'climate smart agriculture' operate at the project level to perhaps justify the flow of resources but have limited resonance at the local level. A few farmers – mainly local leaders, group leaders and those with some level of education - appreciate the possibility of co-benefits other than just crop productivity, but of these, only one mentioned carbon. For instance:

> 'The community resource persons explained to us the project. Initially our group was involved in farming and beekeeping. So she did not find difficulties in training us. Since we have experienced a lot of drought and low yields, the activities we do with the project will change our environment and improve the productivity of our farms in addition to other benefits'[Male farmer with secondary education, Wagai] We expect to benefit from the teachings we get from ViA. Carbon money will only benefit those who work hard. We don't know how much the money is' [Chairman Ngare Youth Development Group; August, 2011].
>
> 'We attended a workshop for three days in the project offices together with some group leaders and we were told how the project will work. The project will assist farmers in planting trees to control soil erosion and build their capacity on the new farming techniques [Chief West Gem Location, Wagai, August 2011].

**State-based narratives: agriculture for economic growth**

Given these divergent narratives between the project and farmers, how do they articulate with the wider state-led narrative about agricultural development in Kenya? Kenya's Agricultural Sector Development Strategy (ASDS) for 2010 – 2020 (Republic of Kenya, 2010b) focuses on enhancing economic development via agriculture. It draws lessons from earlier strategies such as the Economic Recovery Strategy (ERS) and the Strategy for Revitalizing Agriculture (SRA). The ASDS is administered by the Agricultural Sector Coordination Unit (ASCU).

However, the strategy has no explicit provisions for addressing climate change in agriculture. It mentions the National Climate Change Response Strategy (NCCRS)[17] prepared under the Ministry of Environment as a means to address climate change in agricultural development, but does not expand on this theme. The ASDS focuses instead on making agriculture one of Kenya's economic pillars and there is minimal attention to ecological issues, simply recognising climate change as a threat. As a result, the ASDS document has no mention of climate smart agriculture or agricultural carbon finance as a strategy to address climate challenges in agriculture.

> 'The vision of the ASDS is: A food-secure and prosperous nation. Since the agricultural Sector is still the backbone of Kenya's economy—and the means of livelihood for most of the rural population—it is inevitably the key to food security and poverty reduction' [Republic of Kenya, 2010b: xiii].

It is in the context of this national policy agenda that the KACP is attempting to implement agricultural carbon finance. First, it was difficult for the KACP to get adequate national policy back-

[17] The climate strategy has no mention of climate smart agriculture but instead provides broader cross-sectoral policy roadmap on climate change.

up because the Kenyan government has not institutionalized carbon finance and currently lacks a distinct functional Designated National Authority (DNA) that links its institutions and farmers to carbon markets[18]. In promoting a quick fix to solve the food crisis of the last five years (see Republic of Kenya, 2010c), the strategy emphasises agricultural intensification, fertilizer use and agricultural mechanization: all known to be agents of carbon emission. Moreover the carbon accounting methodology for the KACP considers key pillars of the national agricultural strategy as major emitters of carbon. Divergent narratives thus exist between the project and state led policies.

Despite these diverging policy agendas, 'triple wins' is currently informing the Readiness for Climate-Smart Agriculture (RCSA) programme in Kenya supported by the Danish Ministry of Foreign Affairs[19]. This is indicative of how narratives promoted by powerful actors – and particularly those backed by external funds - find their way into policy frameworks despite their lack of harmony with existing state policies.

# 4. THE INSTITUTIONALIZATION OF AGRICULTURAL CARBON FINANCE

In this section I explore how the foregoing narratives have informed institutional arrangements around agricultural carbon finance in the KACP, as it operates in Siaya. The ways in which farmers are engaged in project activities from the design, dissemination and implementation phases through to monitoring are of particular interest. As the discussion shows, communities' historical engagements with external institutions - specifically ICRAF and government agencies - act to inform people's choices and perceptions in relation to agricultural carbon finance projects.

### Engaging farmers in an agricultural carbon finance project

Standard guidelines for engaging farmers in agricultural carbon finance are informed by the triple win narrative (see Campbell et al 2011; World Bank 2005). In these standards, carbon projects are expected to develop, disseminate and support agricultural practices that achieve the 'triple wins' in a participatory way (World Bank, 2011). How has this played out in the KACP?

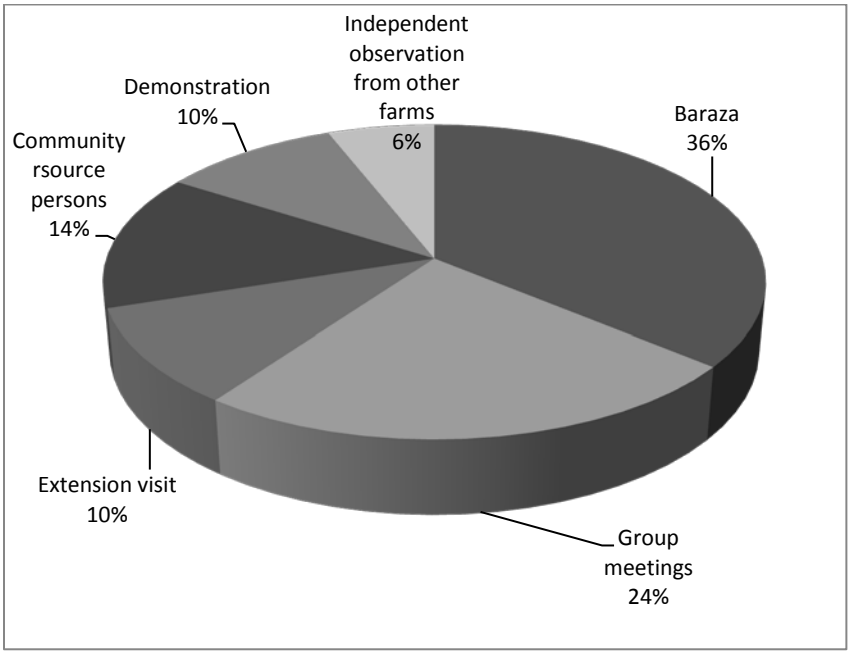
When the KACP laid out its intentions, the provincial administration, including area Chiefs and their Assistants, village elders and leaders of existing CBOs were the entry points into the community. Local contact persons then organized a series of meetings that brought together all farmers and KACP staff in the project area. In these meetings, farmers were told about the project activities and what was expected of them. At the same time, community contact persons were given the opportunity to explain further details of the project and its benefits, based on the training sessions and seminars they had attended[20]. Most farmers indicated that they heard about the KACP through meetings organized at the Chief's barazas (Fig 4.1). Other fora such as umbrella CBOs, community resource persons, farmer visits, trainings and group meeting were also used.

[18] Interview with KACP staff, Kisumu, August 2011

[19] Interview with thw Ministry of Agriculture staff, Nairobi, February 2011

[20] Focus group discussion with farmer group 'B', Wagai, August 2011

**Figure 4.1: Fora through which farmers under KACP learnt about the project and its activities**




Chiefs' barazas are a decentralized local administrative forum where governance issues affecting local people are discussed and new development initiatives from the government and NGOs are announced. They were established by colonial officers as fora for local political bureaucracies who could thus exercise external authority over their clientele (Fleming, 1966). Discussions with farmers revealed that the news of incoming 'development' projects associated with the barazas attract enormous interest from local opinion makers - including leaders of community based groups, community resource persons and elders representing different interest groups within the community. Barazas are public although some community members go there only to hear rather than participate in the deliberations[21].

Practices of introducing initiatives to farmers through local elites in fora such as the Chief's barazas have evolved over time, but have commonly been deployed by new projects as an effective way to gain farmer acceptance of external projects and technological solutions. Farmers perceive barazas as conduits for legitimizing information provided by the state and external actors. Consequently, farmers perceive 'participation' in barazas as a top-down process whereby local elites and contact farmers are the only entry points into the community, and they shape the nature and content of the engagement. As one Chief emphasised:

> 'I represent an authority in this area and without my permission; no project can be approved by the community. The community has trust in me and believes I understand all aspects of governance and development. Therefore any project coming into this area has to go through my office' [Chief West Gem Location, Wagai].

Such relationships and perceptions have built up through a long line of projectized interventions. A case in point is ICRAF which has operated in this area for many years, promoting approaches to on-farm soil fertility management[22]. Indeed the package of interventions under the new label

[21]Interview with the Assistant Chief, Nguge Sub-location, Wagai, August 2011

[22]Focused group discussion with farmer group 'B', Wagai, August 2011

'climate smart agriculture' are by and large a product of ICRAF work (see Place et al, 2006), now supported through the CGIAR led Climate Change Agriculture and Food Security research initiative (CCAFS, 2009). These tightly connected actor networks have had a major influence not just on the technological components but also on the approaches to engagement in the project area.

A brief history of the approaches used in these prior projects illustrates this influence[23]. In the 1980s, at the start of ICRAF work on soil fertility in western Kenya, the village approach to farmer engagement was initiated. This involves initial contact with the area Chief and village elders, who would then defer to an entity described as a village committee with which ICRAF officers would discuss soil fertility problems in the area. The village Chief and headmen would then convene a meeting for all farmers and train them on in the use of new technologies and practices, such as agro-forestry. In the 1990s structural adjustment programmes created inequalities in farmer access to farm inputs and extension services, bringing socio-economic challenges to the for[24]. Approaches such as the catchment area extension approach, the training of resource persons/agents, and participatory learning and action research were adopted by ICRAF and partner institutions including KARI and the Ministry of Agriculture. These approaches attempted to incorporate farmers' socio-economic needs and situations into biophysical and technical research. Ideas of farmer participation became a major pillar in the trial and dissemination of new soil fertility practices such as biomass transfer and fallow systems for increased crop yields. However, the 'purported' participation in practice simply reinforced earlier approaches of using community contact persons to disseminate information to other farmers. It has not proved straightforward to address communities' long-term socio-economic concerns within institutions that are largely evaluated on the basis of technical research outputs, rather than their implementation on the ground. Projects such as the Western Kenya Integrated Ecosystem Management Project (WKIEMP) had to grapple with the competing interests of generating scientific outputs versus community participation.[25]

This history has meant farmers in this area are the recipients only of farming technologies, and have to depend on external contact persons for training and news of new technologies or projects. The KACP is repeating this engagement pattern in its attempts to promote carbon capture and storage as a solution to declining crop yields and income in the forms of 'triple wins'. The prior approaches directly affect how 'triple wins' messages are disseminated to and perceived by farmers. The KACP has provided motorcycles for extension staff and deployed them within the local areas, in an attempt to engage farmers closely. However, the extension staff only interact with selected farmer groups especially in meetings where many farmers can be reached at the same. At the time of this field visit, three extension workers were stationed in Wagai and were assigned to work with a number of farmers.[26] As one put it:

> 'Some of us were just brought into this area the other day we also still do not understand very well the issues of carbon. We need time to get used to the situation. For instance under the carbon project one has to work with so many farmers to meet the target hectares of land for the project' [KACP extension staff, Wagai, August 2011].

As a consequence it is common for community resource persons who frequently interact with farmers to assume the role of contact farmers and mediate between extension staff and farmers. Through this advantage position, it is likely that the contact farmer gets first priority in access to

[23]The history was scoped from three elderly farmers and a chief in Wagai, August 2011. Also see Place et al (2006)

[24]See Rono (2002)

[25] KARI staff, Nairobi, January 2012

[26]Interview with KACP extension staff, Wagai, August 2011

project resources and opportunities to initiate demonstrations in their farms (Fig 4.2). Other farmers are expected to observe and replicate the activities in their own farms. The decision of a farmer to be part of the KACP relies on him/her being part of a group. However, not all group members embrace project activities. Interviews with a number of farmers indicate that whether or not they engage depends on their understanding of the project and its impacts on their livelihoods – impacts that, in line with farmers' narratives, are perceived to revolve around the immediate benefits of food security and income.

**Figure 4.2: a demonstration plot belonging to a community resource person**

I observed that group meetings that had evolved around a 'saving and lending' initiative, attracted high attendance compared to KACP specific meetings. The perceived economic benefit of engaging in an initiative is often paramount, not because these farmers are business actors but because they need money for pressing food purchases:

> 'Sometimes you visit a farmer and you find malnourished children desperately looking at their mother and so you wonder whether to start the training on carbon work or sort this social problem first, and in such a circumstance, the farmer normally presents his/her urgent need for food in a way that easily overrides the aim of the visit'. [KACP extension staff, Wagai, August 2011].

Some projects have managed to establish farmer participation through such an economic line of approach, but often at the expense of the sustainability of interventions.[27]A farmer who worked under ICRAF noted that he got paid for providing a plot for demonstrating soil fertility techniques. The practice of paying famers some money to secure participation bears on KACP. KACP avoided disclosing issues of carbon payment and benefit sharing to farmers to moderate expectations and encourage participation not based on payments.[28]However, the approach potentially weakens farmers' commitments and subsequent understanding of the project. Discussion with an official of

[27]Interview with an Assistant chief, Wagai, August 2011

[28] Interview, KACP staff, Kisumu, August 2011

the umbrella CBO, West Gem Integrated Farmer Association Prgramme (WIFAP) revealed that farmers from one of the administrative areas (Sinaga) were reluctctant to work with the project due to lack of direct and clear promises of carbon money. Farmers feared that the project was not giving any tangible reward at the beginning, unlike previous projects.

> 'The Luo people have a big challenge. They only expect money from projects. The carbon project has not given even a single cent. Farmers in Sinaga location in Yala division pulled out of the project because no money was being given'. [Chairman, Umbrella CBO (WIFAP) , Wagai, August 2011].

Similarly in the KACP, a community resource person noted that the lack of any immediate benefit acted as a disincentive to farmers' involvement:

> '[…] I am getting difficulties in training farmers under KACP because ICRAF paid some farmers to be part of demonstration of biomass transfer and agroforestry practices. They also provided farmers with food for work at the beginning which KACP has not done'. [Community resource person, Wagai, August 2011].

Such non-commitment also played into clan differences and inter-clan competition for project resources[29]. For example, on my way to interview the Chief of West Gem location in the project area, I saw a group of farmers ploughing a farm next to the road - a bare farm with no single tree. As the farm fell within the project area, it caught my attention. I decided to get off the motorcycle and chat with them. Amongst other questions, I asked why they had not planted any trees on that farm and they responded:

> '[…] we are ICRAF people and we have demonstrations in other plots. This is a group plot and that is why we are working together here. The agroforestry people work more with the people of Nguge and they have many trees there' [Female famer, Wagai, August 2011][30].

The above discussion indicates that implementing agricultural carbon finance in smallholder farms is highly contested and subject to complex negotiations, affected significantly by past interventions in an area. New projects must respond to this context, and so it is no surprise that a carbon intervention mimics prior interventions that have shaped community understandings in particular ways. However, the level to which these efforts promote farmer capacity for informed engagement in a carbon project is questionable. Many farmers have no idea that the new project is being implemented under 'a triple win', climate smart agriculture banner, and they assume simple continuity with past interventions. This may be a pragmatic response, but should farmers have the right to know the context for such interventions and be allowed to share in the information about potential carbon revenues being developed through the practices on their land? A wider political and ethical issue about disclosure, accountability and transparency is raised. With shifts in rights (over land, trees and carbon) resulting from the project, new vulnerabilities may be created. Such new vulnerabilities may shape and exacerbate social differences and inequalities. In the next sub-section, the gender and age implications, in particular, of these approaches are discussed.

[29] Discussion with a community resource person, Wagai, August 2011

[30] Informal discussion with farmer group 'E'

**Gender dimensions and generational issues in carbon projects**

Farmer participation in a carbon project shapes and is of course shaped by social issues related to gender. In the KACP, farmer groups link the contact persons and the individual farmers. Notably, women largely initiate the formation and running of these groups and in most cases, dominate in terms of numbers. On average, women constitute about 80% of groups' membership while men and youth share the remaining 20% membership.[31] This numerical gender disparity in farmer groups largely reflects gender roles.[32] Women in this area are the primary food producers engaged in farming activities to meet their role of managing the household (Fig 4.3). As one puts it:

> 'I felt that coming together provides a collective power to face the daily challenges that we face in this community' [Female farmer and a member of Kanyamanga Women Group in Wagai of Siaya County; August, 2011].

**Figure 4.3: a women group in Siaya County during a collective land cultivation session**

While women are the farmers in these areas and take the lead in the communal groups, most resources - especially land - are traditionally controlled by men. Men have greater authority in deciding which farming methods, agroforestry systems and even crops to plant in the farm. With the women dominating the groups through which carbon related land uses are disseminated, it is nevertheless men who are expected to approve their implementation. This contests the extent to which project activities disseminated through trainings in groups or demonstrations take place in practice.

Young people are also postulated as a major labour force that could drive development in Africa (see Republic of Kenya, 2012a), but their participation in agriculture, let alone projects related to carbon, is very low. In the KACP, youth participation is as low as 5%. The poor involvement of young people in group-based rural farming is partly conditioned by cultural norms which prescribe keeping away from elders' affairs as a sign of respect.33 If this norm is strongly enforced

[31] Derived from farmer groups 'A' 'B' and 'C' working under KACP, August 2011.

[32] Interview with a community resource person, Wagai, August 2011

33 Discussion with the representative of group 'D' working under KACP, August 2011

early in a young person's life, he or she later finds it difficult to associate with the elderly women and men in the groups. Youths are also reportedly impatient and prefer quick money which in most cases is not forthcoming from environmental initiatives such as carbon projects. Indeed the majority of young men in the project area prefer operating motorbikes which generates immediate income. According to village elders, there is even a trend for youth to sell local resources such as land and then migrate to urban areas to look for formal employment. This form of age-related gender disparity potentially bears negatively on the KACP in the context of the 20 year implementation period. At the moment, the life expectancy in Siaya County is averagely 50 years (Republic of Kenya, 2012b). This implies that in the 20 years, most farmers would be 70 years of age - way above the life expectancy level.[34] In reality, most farmers currently in the groups may only be active in the next five years. It is the youths who are expected to continue the good farming practices promoted under the KACP. Their thin presence in the groups may therefore affect the project's sustainability.

The preference to be part of the project for as long as 20 years is also complicated by other social differences. The ownership of activities such as trees planted for carbon, by for example marrying women and career-changing youths may not be guaranteed, further affecting commitment of some social groups to the project.

The above discussions show that many actors and institutions, differentiated by place and position across international, national and local settings, and by resources, knowledge/science and gender and age, are involved with the KACP in different ways. These actors have varying interests in what the project might offer, and varying kinds of authority. As the next section explores, the power relations amongst these actors both shape, and are shaped by, their intersection with agricultural carbon finance – and carbon accounting procedures in particular.

**Actors networks: power in carbon finance**

As indicated above, a number of powerful actors influence the global narratives which frame local interventions like the KACP. In brief, the World Bank BioCF has mobilized funds from six public institutions and twelve private companies in developed countries to develop and purchase carbon captured in forests and agro-ecosystems (World Bank, 2011).The fund purchases carbon credits from the KACP in the form of commercial transactions rather than development grants (World Bank, 2011). The World Bank BioCF contracted external consultants to give technical support to the KACP design and monitoring procedures which the project staff/management have been assigned to administer. The CGIARs, especially the ICRAF-led soil fertility research in western Kenya and the CGIAR-led Climate Change and Food Security research programme (CCAFS) also influence the technological packaging of the 'triple wins'.

The donor-science network therefore influences the global conceptualization of agricultural carbon finance, and hence project implementation processes, including carbon accounting and payments. Yet these procedures often remain opaque to many local staff, let alone farmers. In one instance, KACP extension staff noted that they can easily advise farmers on farming practices and record the number of trees or fallows established on what area of land. However, how these activities translate into carbon credits is not clear to them. This carbon finance aspect of the project is of course crucial to its novelty and 'triple wins', if we consider that farmers had prior exposure to the sustainable land management activities. Due to their very limited input into developing the accounting procedures, extension staff experienced difficulties in clarifying key aspects to a

[34] Source: Farmer group membership records, August 2011

sample of farmers selected for monitoring purposes.[35] Consequently, farmers who implement farming practices may not even be aware that they are producing this commodity of carbon at all. Instead they interpret promises of finance in other terms. For instance one farmer commented: '[…] we were told we will be given something as an appreciation for working with the project'.

Locally, as we have seen, elites act as conduits to people becoming involved in a project. This acts to exclude many people. The local elites benefit from their positions as contact farmers with demonstration plots by being able to access project resources more easily. Projects in turn present their claims of success – levels of participation, impacts - through 'eloquent' and 'well informed' local elites in a bid to bargain for stronger positions in the donor network. Even within farmer groups, exclusion exists. Many groups have a secrecy code that prohibits sharing of meeting deliberations to non-group members.[36] Through this, they are able to confine new farming techniques only to group members, out-compete other groups and be recognized by the project. State departments and other agencies enlisted as implementing partners are motivated to work within resource-endowed networks to compensate for their lack of funds. In such ways, power relations in agricultural carbon finance transect through various levels of governance. This is illustrated visually in Figure 4.4.

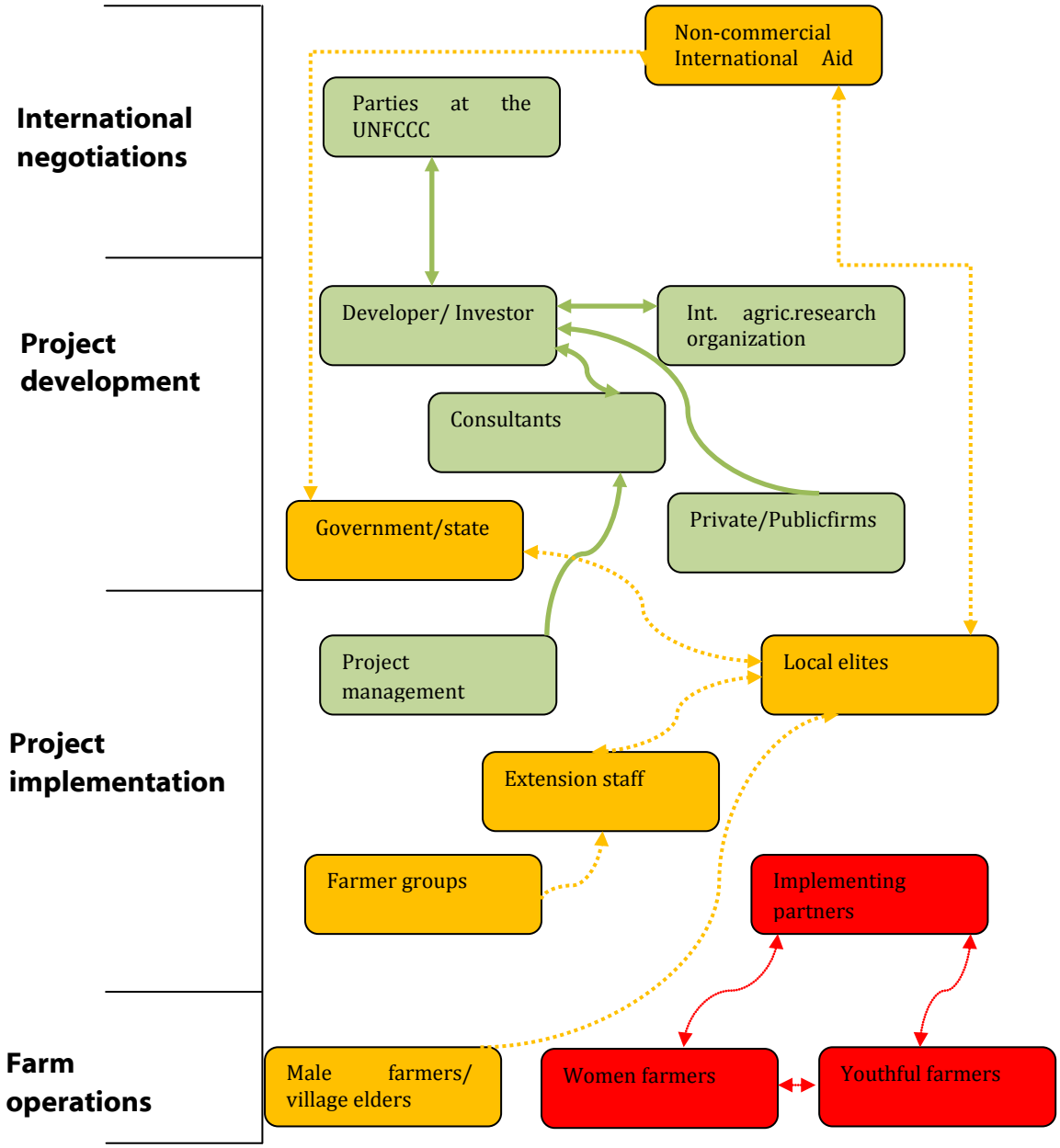
The diagram uses a traffic light system to represent power relations among actors. Green represents the most powerful network that enjoys control of project design and benefits and understands the three 'wins'. Yellow represents the second place network of actors who have some idea about what is happening but are kept out of the most powerful network by not being part of certain procedures. The weakest network is red, including poorer farmers, mainly women and youth, who generally understand only the single potential 'win' to do with food security and immediate livelihoods. The partner organizations in the red network are either not motivated to know what is going on because there is no carbon money yet available, or are simply kept away from project information in the context of bargaining for stronger positions in the donor network. The youthful farmers tend to prioritise shorter-term concerns, rather than carbon money which takes a long time to be realised. The more the arrows leading to an actor, the more powerful that actor is in a given network and the fewer the arrows leading to an actor, the less powerful that actor is within the network. The nature of the lines represents the strength of actor connections within a network. The more powerful the network is, the tighter the connection between actors in that network (thick continuous lines).Similarly, the less powerful the network is, the weaker the connections between actors in that network (thin dotted line).

Given this pattern of power relations, who gains what in financial terms? The next section explores the carbon accounting system and the flows of funds.

[35] Meeting with the Activity Baseline Monitoring Survey sample farmers, Wagai, August 2011

[36] Discussion with farmer group C, Wagai, August 2011

**Figure 4.4: Schematic presentation of actor networks and power relations in agricultural carbon finace. The networks trasect across levels of govenance**



# 5. IMPLICATIONS OF CARBON FINANCE FOR SMALLHOLDERS: WHO BENEFITS?

**Carbon accounting: applying the approved methodology in KACP**

The recently approved methodology for accounting carbon from sustainable agricultural land management practices (SALM) is applied in the KACP. The methodology was developed based on early lessons from the KACP. It was technically designed by Unique Forestry Consultants and Johanneum Research Consulting Firm through World Bank support. The method is claimed to be the first in the field and a milestone in efforts to streamline agricultural carbon finance:

> 'The Verified Carbon Standard approved this first methodology on soil carbon, a new approach for sustainable agricultural land management (SALM) practices. The methodology was developed by the World Bank for the Smallholder Agriculture Carbon Finance Project run by the non-governmental organization Vi Agroforestry in western Kenya. The pilot, involving more than 60,000 smallholders who are farming 45,000 hectares of land, is run together with smallholder farmers and supported by the World Bank's BioCarbon Fund' [World Bank News and Broadcast; Press Release No:2012/252/SDN. January 30, 2012[37] ].

Peculiar to the method is that it combines computer-based Roth C models with a field-based Activity Based Monitoring System (ABMS) to avoid high costs associated with soil sampling. The full methodology is complex and detailed; crucial is understanding how it works on the ground[38].

Farmers in the KACP take part in implementing the methodology. Their participation in the procedure, according to project staff, raises awareness on carbon issues and reduces costs. A sample of 15 farmers referred to as 'ABMS farmers' was selected to structure the participatory monitoring process. This implies that information presented from other farmers can be monitored closely through this sample. Farmers provide information about their farming practices (see Table 5.1) in a 'self-evaluation form'. The forms are filled regularly and submitted to extension staffs through groups or community resource persons. The forms are then passed to the project offices from where data on carbon credits is processed.

[37] http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,,contentMDK:23100745~pagePK:64257043~piPK:437376~theSitePK:4607,00.html

[38] For the full methodology: http://www.v-c-s.org/methodologies/VM0017

**Table 5.1: Details of SALM practices to be recorded and used in the Roth C model for determining Soil Organic Carbon**

| SALM Activity | Details recorded by the ABMS |
|---|---|
| **Manure management** | ▪ Area of grazing (ha)<br>▪ Number of livestock per animal type<br>▪ Amount of manure produced (kg/ha or kg/an)[39]<br>▪ Existing manure management practices and their frequency |
| **Residue incorporation** | ▪ Productivity of each crop (kg/ha)<br>▪ Area of each crop (ha)<br>▪ Amount of crop residues (kg/ha)[8]<br>▪ Existing crop residue management practices and their frequency<br>▪ Future crop residue management practices that will be implemented with the project |
| **Reduced tillage** | ▪ Area under tillage (ha)<br>▪ Type and depth of tillage<br>▪ Existing tilling practices and their frequency<br>▪ Future tilling practices that will be implemented with the project |
| **Agro forestry among others.** | ▪ Area of Agro-forestry (ha)<br>▪ Number and species of trees used<br>▪ Diameter at breast height (DBH) of trees<br>▪ Future numbers of trees that will be implemented with the project |

The ABMS farmers take the lead in showcasing practices to guide validation of carbon credits.[40] Validation is scheduled to take place three times (2011, 2014, and 2017) during the 20 year project period and is done by the Verified Carbon Standard Board (KACP, 2008). Given their central role, the project may give the ABMS farmers more attention than other farmers:

> 'You know you represent the face of the project and if you are not implementing project activities in a good way, then the project will fail' [KACP extension staff Wagai, August 2011].

This carbon accounting methodology can be credited for its participatory approach. However, the quality of this participation is debatable in several ways. First, it involves a science driven selection of the ABMS farmers. In principle, a farmer's willingness to be part of the sample should be sought prior to his/her inclusion in the scheme. Instead the ABMS farmers were selected based on a random computer simulation system and located using GPS coordinates.[41] The computer based random selection is justified in the context of reducing biases associated with local interests. However, it did not embrace the principle of informed consent prior to engagement. Most ABMS farmers noted that their willingness to be part of this system was not sought and they only found out that they were part of the sample when extension staffs and project surveyors appeared on their farms to record land uses. So it is no surprise that some selected plots fell on areas where the farmer was an immigrant who is only a land tenant.[42] Land under short term lease arrangements is not eligible for carbon related activities according to the rules and regulations of the BioCF (KACP, 2008). The project also targets a wide geographical coverage and is in its early stages, so again unsurprisingly the science-driven selection included some farmers who had not heard of the project:

[39] Amount of crop residues need not be measured directly. It can also be estimated from the crop production using equations listed in Table 11.2 in Volume 4 of the 2006 IPCC Guidelines

[40] Focussed group discussion with the ABMS farmers, Wagai, August 2011

[41] Interview with extension staff, Wagai, August 2011

[42] Discussion with extension staff, Wagai, August 2011

> 'One day someone came and told me that my name appeared in a machine to be part of selected farmers for the project and that is how I came to know of the project' [ABMS farmer, Wagai, August 2011] .

Secondly, the credibility of information provided in the self-assessment forms is a contested area. The KACP is the first project subjected to the methodology and so most farmers still do not understand the contents of the 'self-evaluation form'. The forms are written in English while most farmers in the area are elderly and illiterate; an issue that one KACP field manager highlighted as an overwhelming limitation in instituting carbon accounting schemes locally.[43] The extension staff regret their inability to assist farmers adequately to understand the procedure because their input to its design was minimal. In the context of self-assessment, farmers may deliberately provide false information for reasons related to fear or expectations. Some farmers at the beginning of the project, for instance, gave false figures of land acreage at their disposal for fear that the project would take away their land. Extension staff further noted that farmers sometimes understate yields from their farms in expectation of food aid from the project. Similarly, well informed farmers tend to overestimate yields and activities in expectation of being valued as 'good farmers' eligible for prestige during public gatherings - or more shares of carbon money. Such expectations of external assistance, and established behaviours to ensure external benefits, are informed by long histories of intervention in the area as discussed earlier.

These sampling and transparency issues add to the uncertainty around agricultural carbon finance. Uncertainties are accepted as part of the project design. This is why the project discounts 60% of the accounted carbon. However, this discounting assumes uncertainty in one direction (under-estimation) while field experience shows that farmers can either overestimate values or underestimate them. Also consider that the KACP works in an area where several other NGOs and government organizations exist with the aims of reducing poverty and conserving the environment. KARI for example, through the Western Kenya Integrated Ecosystem Management Project (WKIEMP), until 2010 worked with the same farmers to establish several community tree nurseries and undertake participatory reforestation in the same area as the KACP.[44] Some of these activities are still on-going and the KARI do not value any carbon resulting from the activities they promote. During monitoring under the KACP, farmers are likely to record all activities in their farms regardless of which project supported them. This means that some carbon is added into the KACP basket by default. Taking away a massive 60% of carbon credit allocation to farmers is therefore not adequately justified. Carbon accounting drives the process of who benefits and who loses, yet it is clearly contested in practice. Such flaws may benefit other actors and networks more than farmers, reflecting the power relations discussed earlier.

**Access and ownership of carbon related resources**

The issues raised in the monitoring procedures indicate that carbon rights could be reshuffled. Under the KACP, farmers own their land but have to adhere to the principles of sustainable land management practices to which they signed 'commitment forms'. While signing these forms, farmers were informed in rather vague terms that they could get some benefits as an appreciation for engaging in the project activities.[45] Expected carbon revenues are, however, explicitly laid out in the project documents (KACP, 2008; Wekesa, 2010) as discussed earlier. In brief, the documents

[43] KACP staff, Wagai, August 2011

[44] KARI-WKIEMP staff, Kisumu, September, 2011

[45] Several iinterviews with individual farmers, Wagai, August 2011

stipulate that 490,500 tCO2e will be generated after discounting 60% to cover uncertainty during the 20 year project period. These figures may change slightly depending on global carbon prices, but were indicative at the time of the project preparation in 2008. Neither these amounts, nor the proposed system of carbon payment, were clarified to farmers as project managers did not want to raise expectations. Instead, the project keeps carbon payments off the agenda and only highlights them as 'a bonus' or token of 'appreciation' to farmers, while keeping increases in crop yields as the main rationale. As the KACP coordinator highlighted: 'the project's aim is to improve production of staple food, carbon payment only comes in as a co-benefit'. Carbon finance with some elements of trade as in the KACP is considered a sensitive issue in the context of a development project, and it is reasonable to seek to avoid false expectations. However, later contestations may arise if farmers - as the producers of carbon - argue that they had no input into designing the sharing procedures.

The carbon accounting procedure in the KACP is based on individual land holdings, as is the concept of 'carbon rights' and associated payments. However, more than 50% of land in the project area is held customarily and legitimised by traditional passage of use rights from one generation to the other (KACP, 2010). The customary land rights are held by individual families but communal use of the land is a common practice in this area. Given that residue incorporation and vegetation retention in these farms are some of the carbon-generating activities, should farmers allow free grazing of land during the dry season or instead conserve residues for sequestration, and individual benefit? Such conflicting land and resource tenure arrangements may create significant conflicts as the commoditisation of carbon creates incentives to privatise and individualise resources. This potentially aggravates local injustices in terms of access and ownership of land and resources, potentially excluding tenant farmers, landless people, women and youth who traditionally have no ownership rights over land – in this part of Kenya as in many African societies. Appendix 4 of the project design document, (KACP, 2008), attempts to address these rights in line with BioCF rules of engagement. In this appendix, the project recognizes customary land rights but ignores the informal yet very important communal land uses common in the area. Claims to carbon rights by farmers owning land under such customary arrangements may not be legitimate in Kenya's court of law. The transfer of land ownership is normally based on oral commitments made by fathers to their sons. This implies that disputes over carbon may only be resolved by local authorities,[46] reinforcing biases and power dynamics at the local level. Also, such informally enforced land tenure may not create the necessary incentives for land-related investments such as those that generate carbon credits (see IFPRI, 2002; Swallow et al, 2002).

Within farmer groups, commitments to implement the project's activities are re-inforced. Such measures include reducing a farmer's shares to compensate for absenteeism during a joint farming session, and reporting a non-complying farmer to the extension staff through the community resource persons. The extension staff can then technically exclude certain farmers from the project activities and possible benefits. These rules are also enforced by the local authorities, including chiefs and village elders in the context of dispute resolution. But do farmers have the entire rights to carbon from their farms? Based on the sharing out procedures of the carbon credits, farmers will end up receiving 28% of the carbon revenues (see calculations in table 5.2. The bulk of the original credits (60%) are discounted as uncertainty and about 12% of the credits are used to finance extension. Whether or not farmers are willing to take part in the sharing out of carbon revenues on such terms may yet add more contestation to the question of carbon rights.

[46]See appendix 4 of the project design document (KACP, 2008)

**Carbon benefits: impacts on local livelihoods**

For farmers, a carbon payment could be a catalyst to improved livelihoods. During this study it was not possible clearly to delineate the impact of the KACP on farmers' livelihoods because the project is only in its early stages. However, three elements were emerging as potential impacts of the project on farmers' livelihoods. These are hypothetical carbon revenues, capacity building and land use change.

The hypothetical impact of carbon revenues to farmers is greatly reduced by uncertainty discounting and other sharing out procedures (Table 5.2).

**Table 5.2: Benefits sharing from the carbon revenues generated from farmers working with KACP**[47]

| Item | Value in $ (at US$4 per ton $CO_2e$) | % share of the initial credits |
|---|---|---|
| Total revenue from carbon sequestered over 20 year period | 4,920,000 | 100 |
| Total revenue after discounting 60% as uncertainty | 1,968,000 | 40 |
| Farmer contribution to the project | 590,400 | 12 |
| Direct share to farmers | 1,377,600 | 28 |
| Direct share to each farmer based on discounted credits | 22.96 | 0.000466667 |
| Direct share to each farmer based on initial credits | 82 | 0.004166667 |

Table 5.2 shows that uncertainty and contributions to extension reduce farmers' benefits four times. The implication is that over a period of 20 years, a farmer will receive about US$23 as part of carbon revenue. This effectively translates into about US$1 per year. Such figures were tagged as 'illusive promises' of carbon money in Sharma and Suppan (2011). Ideally, US$1 is only sufficient to purchase 1 kg of grain and a tin of *dagaa* (small fish), sufficient for a day's food for an average household of five persons in Siaya County. This clearly cannot make a significant impact on the welfare of an individual household. Project managers argue that if invested collectively in a communal initiative, the impacts may have broader significance bringing positive resonance at household level. Even so the total benefits remain insignificant to farmers' livelihoods.

Most farmers admit that they have been taught about sustainable land management practices and highlight this as the main impact of the project. The link between these activities and climate change was however not clear for many farmers. The project's extensionists justify their focus on sustainable land management activities – essentially carrying on work that was done before – as a way of contributing to farmers' key needs for increased maize yields.

In terms of land use change, farmers agree that before the KACP, they knew about soil erosion control activities but were not committed to practice them. The training they have received from the KACP, however little, has enhanced their commitment to practice the activities. Prior to the project, a larger share of land was allocated to maize and beans for food, followed by sweet potatoes for cash. Farms have since benefited from the introduction of agro-forestry tree species. Some species introduced through the project are multipurpose and mature fast to provide feed to

[47]Table derived from author's calculations based on the accounting procedures contained in the project document (KACP, 2008) and information from project staff regarding uncertainty to be considered by the project.

livestock and firewood for farmers' energy needs. However, it is not clear if these activities have improved yields of the staple crop. Moreover the growth of the trees is affected severely by drought conditions. Farmers here practice rain-fed agriculture and report access to water as their greatest challenge. This is in line with their narratives around rainfall unreliability as the cause of poor crop yields. According to one of the area's chiefs, during drought periods, several households depend on a single common well. As such, crops, planted trees and fallows frequently dry up – more so in recent times than a few decades ago. This also means that women have to spend more time fetching water for domestic use at the expense of implementing sustainable land use activities for carbon. Although outside the arena of farmers' knowledge, it is the case that lack of water in the farms also affects carbon formation which requires adequate moisture in the soils to decompose the cell walls of crop residues and tree roots, and to promote a transformation into carbon stored in the soils. Similarly, the process of photosynthesis which results in the formation of complex carbon in the cell wall of plants and roots require moisture. However, during discussions with farmers and a review of project documents, it was not clear if there are efforts in place by KACP to address this underlying threat:

> 'I have only 2 local cows which might not supply enough farm yard manure to increase farm productivity whereas the project is not supporting us with any input other than trainings' [ Farmer working under KACP, August, 2011).

Even this brief discussion of impacts indicates that land tenure, gender imbalances, illiteracy and water scarcity are wider development problems that undermine the potential impacts of the KACP. Addressing such underlying critical and sometimes non-climatic factors is an important strategy to enhance farmers' abilities to cope with climate change, particularly in a resource-constrained smallholder farming context. Overall, the KACP project clearly operates in a fragile and vulnerable socio-ecological environment, where carbon sequestration and climate mitigation is necessary but may not be people's most pressing priorities.

# 6. CONCLUSIONS

Depending on how it is designed, agricultural carbon finance presents an opportunity for climate justice for smallholder farmers who are most vulnerable to climate change, while addressing the mitigation challenge. The triple win – of higher yields, climate-resilient farming and carbon sequestration - is theoretically possible. However, these wins are subject to complex socio-economic, political and cultural conditions that have strong bearing on their achievements, as the KACP case highlights.

Even though at the higher levels policies are clear as to what is expected from the Post Kyoto negotiations on REDD, most national policies have not yet institutionalised the provisions of climate smart agriculture. In the absence of these policies, agricultural carbon finance objectives are likely to be overshadowed by national agendas of commercialization of agriculture and farmers' agendas of meeting their immediate livelihood needs – here through increased maize yields. Further, if farmers are not involved in the design of the projects, their conceptualization of agricultural carbon finance may be very weak, resulting in uninformed engagement. Uninformed engagement in turn affects the allocation of carbon rights.

While it may be covenient and cost effective to implement agricultural carbon finance using approaches established by prior projects, the extent to which these approaches may promote farmer capacity for informed engagement in a carbon project is debatable. The basic principles of

agricultural carbon finance are new not only to many farmers but also to many researchers and govenment technocrats. In any case, farmers have a right to informed engagement in such mitigative and adaptation programmes. Exclusion, marginalisation and dependency may result from uninformed engagement and create new vulnerabilities. In other words, a more informed farmer could be more empowered and confident to explore diverse opportunities and cope with climatic stress.

Powerful donor and commercial interests at the centre of agricultural carbon finance projects structure power relations and influence both implementation and the sharing of benefits. Project developers become especially powerful by virtue of their resource endowments and their privileged access to the scientific information that informs project design and carbon accounting procedures. By contrast, farmers, conditioned by lack of adequate capacity on carbon issues, are made to focus on maize yields, while carbon revenue potentials are kept 'grey'. Local institutions, norms and gender and generational imbalances also exacerbate local power dynamics in the implementation of agricultural carbon finance projects.

As the KACP case illustrates, all the above issues ultimately affect the impact of agricultural carbon finance projects – and who gains or loses from them. This analysis suggests five critical policy challenges which will need to be addressed if agricultural carbon finance projects are to acheive their potential – and especially if they are to benefit smallholder farmers. These involve: capacity building; participatory design of projects; additional investment in underlying contraints; grant based funding/compensation as opposed to trade, and strengthening carbon rights.

Capacity building about agricultural carbon finance for national policy makers and farmers is critical. At the national level, policies and programmes should be initiated to train staff in both governmental and non-governmental agencies in the design of agricultural carbon finance projects and technical aspects of carbon sequestration and monitoring. This should target specific individuals and institutions with relevance to agricultural and environmental sectors. Similarly, at farmer level, capacity building must not only focus on sustainable land use practices but should be concerned with improving farmers' understanding of the links between the activities and carbon, and associated opportunities these present to them. Farmer-based capacity building should also aim at establishing and strengthening decentralized agricultural carbon finance institutions, in order to streamline engagements and avoid working through local elites. Increased awareness and education may help farmers pursue new opportunities both within carbon projects, and in the face of uncertain project outcomes.

Participatory design and implementation of agricultural carbon finance projects and associated policies is the second and equally critical challenge. Specifically, farmers' input has to be sought in the design of these initiatives using inclusive participatory approaches. Farmers' knowledge more often than not is side-lined and their input in project design, monitoring and benefit sharing is minimal. Democratization of expertise that recognizes farmers' knowledge and input should substitute top-down, science driven approaches and promote local ownership of agricultural carbon finance projects. As it stands, KACP intent of establishing a climate smart farmer is steered by several external interests. These interests see carbon valuation as a globally recognized scientific or resource opportunity but overlook necessary investment in farmers' aspirations.

Additional investment in underlying factors such as water scarcity, alternative farm and non-farm enterprises to reduce dependence on maize (see Brooks et al, 2009), strengthening land tenure systems and addressing gender imbalances is essential to achieve wider impacts. Carbon projects should include a line on costs to support at least some if not all such broader development issues.

Budgeting for the projects should particularly incorporate provisions for gender related affirmative action.

The financing mechanisms for agricultural carbon projects must also be rethought. The ideal scenario would be for projects to get support as development grants or compensation, not as commercial entities or loans. Climate science shows that smallholders are not a 'significant' cause of climate change. Therefore social justice calls for compensation, rather than making them bear the cost of mitigation programmes. Commercialization of agricultural carbon finance potentially makes issues of carbon rights a grey area. Such financing mechanisms may consider investment in in-depth capacity building on carbon issues as additional costs.

As such, the issue of contested carbon rights and power relations needs to be addressed. Given that the carbon credits are generated by farmers, accounting ought to be transparent. Transparency in deals enhances farmers' trust despite the magnitude of impacts. Strengthening farmers' carbon rights is central to a pathway for farmers to embrace and own agriculture which is climate smart.

It is however worth noting that the politics of carbon finance in agriculture - from an empirical perspective - can be complex, contested and sometimes controversial but real lessons such as the one presented here, may prove useful in saving sub-Sahara Africa from the 'heat'. It is advisable to note that different scenarios may emerge with the continued implementation of the KACP. Continued analysis of such emerging scenarios during the project's life time is a useful research area.

# REFERENCES


African Union (2011) The Johannesburg Communiqué - *Africa: A Call to Action,* African Ministerial Conference on Climate-Smart Agriculture, Johannesburg, South Africa, 13 to 14 September, 2011

Beddington, J. R., Asaduzzaman, M., Clark, M., Fernández Bremauntz, E., Guillou, M. D., Howlett, D. B., Jahn, M., Lin, E., Mamo, T., Negra, C., Nobre, C. A., Scholes, R. J., Van Bo, N. and Wakhungu, J. (2012) 'What Next for Agriculture', *Science,* Vol 335

Bird, N. (2012) 'Approved methodology for the Adoption of Sustainable Agricultural Land Management', *Verified Carbon Standard Methodology,* VM0017 Version 1.0 Sectoral Scope 14. VM0017

Bond, I., Grieg-Gran, M., Wertz-Kanounnikoff, S., Hazlewood, P., Wunder S. and Angelsen A. (2009) 'Incentives to sustain forest ecosystem services: A review and lessons for REDD', Natural Resource Issues No. 16. International Institute for Environment and Development, London, UK, with CIFOR, Bogor, Indonesia, and World Resources Institute, Washington D.C., USA.

Brooks, S., Thompson, J., Odame, H., Kibaara, B., Nderitu, S., Karin, F. and Millstone, E. (2009) *Environmental Change and Maize Innovation in Kenya: Exploring Pathways In and Out of Maize,* STEPS Working Paper 36, Brighton: STEPS Centre

CAADP (2009) *The Comprehensive Africa Agricultural Programme. Progress Report*. NEPAD Secretariat, South Africa

Campbell, B., Mann, W., Meléndez-Ortiz R., Streck, C. and Tennigkeit, T. (2011) *Addressing Agriculture in Climate Change Negotiations. A Scoping Report;* ISBN: 978-0-615-49585-9. Meridian Institute

CCAFS (2009) *Climate Change, Agriculture and Food Security. A CGIAR Challenge Program*. The Alliance of the CGIAR Centres and ESSP, Copenhagen, Denmark; available online at: www.ccafs.cgiar.org

Clement, F. (2010) 'Analysing decentralized natural resource governance: proposition for a "politicized" institutional analysis and development framework'. *Policy Sci* 43:129–56

Corbera, E. and Schroeder, H. (2011) 'Governing and implementing REDD'. *Environmental Science and Policy* 14:89–99

Diaz, D., Hamilton, K. and Johnson, E. (2011) *Status of Forest Carbon Markets 2011,* Ecosystem Market Place

European Tropical Forests Research Networks-ETEFN (2008) *Financing Sustainable Forest Management. Holopainen, Jani and Marieke Wit (eds)*. ETFRN issue no. 49, PP 176

FAO (2011) *Enhancing cost-effectiveness and promoting mitigation actions: the case of agriculture.* Submission by the FAO on various approaches to enhance the cost-effectiveness of and promote mitigation actions, as outlined in paragraphs 79, 80 and 81 of the Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention. http://unfccc.int/resource/docs/2012/smsn/igo/64.pdf

FAO (2008) *The Carbon Sequestration Potential in Agricultural Soils Submission by FAO to the 3rd Session of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention (AWG-LCA3),* Accra, 21-27 August 2008

Fischler, F. (2009) *Agriculture and Climate Change: An Agenda for Negotiation in Copenhagen - The Constructive Role of International Trade*, ASB Partnership for the Tropical Forest Margins. Nairobi, Kenya

Fleming, G. (1966) 'Authority, Efficiency, and Role Stress: Problems in the Development of East African Bureaucracies', *Administrative Science Quarterly* 11: 386-404

Hardin, G. (1968) 'The Tragedy of the Commons', *Science,* 162:1243-48

IFPRI (2002) *Agricultural Intensification by Smallholders in Western Brazilian Amazon: From Deforestation to Sustainable Land Use*; Stephen A. Julie W. and Chantal L. (eds). Technical report No: 130 pp 40-60, IFPRI

IPCC (2007) *Land Use Change Forestry Practices - Fourth Assessment Report, Working Group 3,* Cambridge University Press, Cambridge UK and New York USA

IPCC (2006) *Guidelines on National Green House Gas Inventories Programme;* by Egglestone H., Buendia L., Miwa K., Ngara T., and Tanabe K. (eds)., ISBN 4-88788-032. IGES Japan

Jindal R., Swallow B. and Kerr J. (2008) 'Forestry-based carbon sequestration projects in Africa: Potential benefits and challenges' *Natural Resources Forum* 32:116–130

KACP (2010) *Environmental and Social Assessment for the Kenya Agricultural Carbon Project; prepared by ECF Consultants,* KACP Technical series; Kisumu, Kenya

KACP (2008) *Project Design Document for the World Bank Carbon Finance Business,* The World Bank Carbon Finance Unit. Washington DC

Keeley, J. and Scoones I. (2003) 'Understanding Environmental Policy Processes; Cases from Africa' London; Earthscan/James and James

Kenya National Bureau of Statistics (2009) *Highlights for the 2009 Population census,* Government Printer, Nairobi Kenya

Koontz, T. (2003) *An Introduction to the Institutional Analysis and Development (IAD) Framework for Forest Management Research,* Paper prepared for First Nations and Sustainable Forestry: Institutional Conditions for Success, Environmental and Natural Resources Policy

Minang, P. A., Bernard, F., van Noordwijk, M. and Kahurani, E. (2011) *Agroforestry in REDD+: Opportunities and Challenges*, ASB Policy Brief N

Moorhead, A. (2009) *Climate, Agriculture and Food Security: A Strategy for Change. CCAFS Report,* CGIAR, Denmark

Naess, L., Polack, E. and Chinsinga B. (2011) 'Bridging research and policy processes for climate change adaptation', *IDS Bulletin* 42(3), 97-103

Negra, C. and Wollenberg, E. (2011) *Lessons from REDD+ for Agriculture. CCAFS Report no. 4*, The CGIAR Research Program, Climate Change, Agriculture and Food Security (CCAFS). Copenhagen, Denmark. Available online at: www.ccafs.cgiar.org

Nyaoro, W. (2001) 'Choice and Use of Rural Water Supply Systems: Environmental and Socio-Cultural Dimenssions' chapter 4 In a Mohamed Salih M.A. (ed). *Local Environmental change and society in Africa. Kluwer Academic Publishers , The Netherlands pp 42.*

Ostrom, E., Gardner, R. and Walker, J. (1994) *Rules, Games and Common-Pool Resources. Ann Arbor*, The University of Michigan Press

Pearson, T., Walker S., and Brown S. (2006) *Afforestation and Reforestation Under the Clean Development Mechanism: Project Formulation Manual.* International Tropical Timber Organization. Technical Series, 25. Pp. 53

Place, F., Andato, M., Hebinck, P. and Omosa, M. (2006*) Impacts of Agro-based Soil Fertility Replenishment Practices on the Poor in Western Kenya,* IFPRI Research Report no 142

Republic of Kenya (2012a) *Report on the 2nd Africa Peer Review Mechanism for Kenya*. Ministry of Planning, National Development and Vision 2030, Government Printer, Nairobi, Kenya

Republic of Kenya (2012b) *Kenya County Fact Sheets: Siaya County,* Government Printer, Nairobi, Kenya

Republic of Kenya (2010a) *The Constitution of Kenya, Section 5 Land and Environment,* Government Printer, Nairobi, Kenya

Republic of Kenya (2010b) *Agricultural Sector Development Strategy for 2010-2020,* Government Printer, Nairobi, Kenya

Republic of Kenya (2010c) *Kenya National Climate Change Response Strategy,* Government Printer, Nairobi, Kenya

Republic of Kenya, (2008) *Siaya District Development Plan for 2008-2012*. Government Printer, Nairobi, Kenya

Rodel, D. L., Remedios, S.E. and Florencia, B. P. (2010) 'Potential of Community-Based Forest Management to Mitigate Climate Change in the Philippines', *Small scale Forestry* 9:429-443

Rono, K. (2002) 'The impact of the structural adjustment programmes on Kenyan society' *Journal of Social Development in Africa* 17 (1): 81-98

Scherr, S., Shames S, Wallace C., Hatcher J., White A. and Making REAL (U) Right (2010) *Harmonizing Agriculture, Forests and Rights in the Design of REDD+*. World Agroforestry Centre

Schroeder, H. (2010) 'Agency in international climate negotiations: the case of indigenous peoples and avoided deforestation', *Int Environ Agreements* 10:317–332

Seeberg-Elverfeldt, C. (2010) *Carbon Finance Possibilities for Agriculture, Forestry and Other Land Use Projects in a Smallholder Context*, FAO, Rome, Italy

Shames, S. and Scherr S. (2010) *Institutional Models for Carbon Finance to Mobilize Sustainable Agricultural Development in Africa.* EcoAgriculture Partners on behalf of the United States Agency for International Development (USAID)

Sharma, S. and Suppan, S. (2011) *Elusive Promises of the Kenya Agricultural Carbon Project,* Institute for Agriculture and Trade Policy, South Minneapolis, Minnesota, USA

Sikor, T., Stahl, J., Enters T., Ribot J., Singh N., Sunderlin, W. and Wollenberg L. (2010) 'REDD-plus, forest people's rights and nested climate governance', *Global Environmental Change* 20: 423–25

Smukler, S. and Palm, C. (2009) *Agriculture and Climate Change: An Agenda for Negotiation in Copenhagen - Monitoring, Reporting, and Verification Methodologies for Agriculture, Forestry, and Other Land Use,* ASB Partnership for the Tropical Forest Margins. Nairobi, Kenya

Stabinsky, D. (2011) *Fiddling with Soil Carbon Markets while Africa Burns…!* Action Aid, USA

Stern, N. (2006) *The Economics of Climate Change: The Stern Review,* Cambridge, UK

Stuart, M., Lundgren, A. and Morozova, S. (2003) *Clean Development Mechanism, A User Guide,* United Nations Development Programme

Swallow B., Noordwijk M. and Garrity, D. (2002) 'The effects of scales, flows and filters on property rights and collective action in watershed management', *Water Policy* 6: 457-474.

UNFCCC (2012) *Report of the Conference of the Parties on its Seventeenth Session* held in Durban, 28 November - 11 December 2011. FCCC/CP/2011/9/Add.1

UNFCCC (2009) *The Copenhagen Accord: Report of the Conference of the Parties on its Fifteenth Session* held in Copenhagen, 7-18 December 2009,FCCC/CP/2009/L.7

UNFCCC (2008a) *Kyoto Protocol Reference Manual on accounting emissions and assigned amount*. UNFFCCC Secretariat, Bonn, Germany.

UNFCCC, (2008b) *The Bali Action Plan. Report of the Conference of the Parties on its thirteenth session, held in Bali from 3 to 15 December 2007,* FCCC/CP/2007/6/Add.1

UNFCCC (1998) *The Kyoto Protocol to the United Nations Framework Convention on Climate Change,* UNFCCC Secretariat, Bonn, Germany

Van Noordwijk, M., Agus, F., Dewi, S., Ekadinata, A., Tata, H. L., Suyanto, S., Galudra, G. and Pradhan, U.P. (2010) *Opportunities for Reducing Emissions from All Land Uses in Indonesia: Policy Analysis and Case Studies,* Partnership for the Tropical Forest Margins, Kenya

Wekesa, A. W. (2010) 'Kenya Agriculture Carbon Finance Project', PowerPoint presentation, 2010

Woelcke, J. (2012) *Smart Lessons, Real Experiences, Real Development. More Than Just Hot Air: Carbon Market Access and Climate-Smart Agriculture for Smallholder Farmers*. The World Bank Washington DC

Woelcke, J. and Tennigkeit, T. (2011) *Operationalizing Agricultural Carbon Projects: experiences from Kenya,* PowerPoint presentation, 2011

Woelcke, J. (2011) *Operationalizing Agricultural Carbon Projects –Experiences from Kenya,* The World Bank and Unique Forestry

Wollenberg, E. and Negra C. (2011) *Next Steps for CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)*, the H. John Heinz III Center for Science, Economics and the Environment Policy Brief

Wolmer, W., Keeley, J., Leach, M., Mehta, L., Scoones, I. and Waldman, L. (2006) *Understanding Policy Processes. A Review of IDS Research on the Environment, June 2006*, Institute of Development Studies, University of Sussex

World Bank (2011) *BioCarbon Fund Experience; Insights from Afforestation and Reforestation Clean Development Mechanism Projects,* Carbon Finance Unit, The World Bank, Washington DC

World Bank (2010a) *The Hague Conference on Agriculture, Food Security and Climate Change: Opportunities and Challenges for a Converging Agenda: Country Examples,* The World Bank, Washington DC

World Bank (2010b) *Project Information Document, Project number 53088,* The World Bank, Washington DC

World Bank (2008) *World Development Report 2008: Agriculture for Development,* The World Bank, Washington DC

World Bank (2005) *The BioCarbon Fund Overview,* BioCF Project Training Seminar, The World Bank, Washington DC

Zomer, R. J., Trabucco, A., Coe, R. and Place, F. (2009) *Trees on Farm: Analysis of Global Extent and Geographical Patterns of Agroforestry,* Working Paper no. 89, World Agroforestry Centre, Nairobi, Kenya

# APPENDIX

## Farmer commitment form

**FARMER COMMITMENT AND ACTIVITY MONITORING FORM**

This form allows the farmer freely to promise and commit to undertake the Sustainable Agricultural Land Management (SALM) practices that improve soil fertility, increase farm productivity or crop yields, contribute to carbon emission reduction and enhance environmental conservation for the period of _____ years starting from year 2010 to 2017. The farmer will annually undertake self assessment and report the progress to his/her group. This form will guide the farmer to plan, commit, implement SALM practices and monitor land productivity.

**FARMER DETAILS**

Name of the farmer ..... Sex.....Age.....

Occupation.....Group Name.....Village.....

Sub-location.....Location.....Division.....District.....Year.....

Legal land tenure status (tick): Own ☐ Lease ☐ Family☐

Land use acres: Total land ☐ ultural land ☐ t land grazing ☐ other land ☐ ☐

**Current Sustainable Agriculture Land Management practices on the farm**

| Field ID | Field Acreage | Crop/Tree species | | SALM practice (based on the list) | | 1st season | | 2nd Season | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | No. of units produced | No of trees in crop land | No. of units produced | No. of trees in crop land |
| | | 1st Season | 2nd Season | 1st Season | 2nd Season | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

**Current Sustainable Agriculture Land Management practices on the farm**

| Livestock type | Total number | No. under improved management |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

| HH cooking and heating in hours | |
|---|---|
| Firewood | |
| Charcoal | |
| Kerosene | |
| Manure | |
| Grasses | |

**Current SLM practices continued**

**Sustainable Land Management Practices to be undertaken (next season/year)**

| Field ID | Acreage | Crop (Variety) Tree (Number) | | SLM practices to be undertaken (based on the list) | | Livestock | | | HH cooking and heating (hours/day) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 1st season | 2nd season | 1st season | 2nd season | Type | NO. | No. Under improved management | | hrs per day |
| | | | | | | | | | Firewood | |
| | | | | | | | | | Charcoal | |
| | | | | | | | | | Kerosene | |
| | | | | | | | | | Manure | |
| | | | | | | | | | | |
| | | | | | | | | | | |

**COMMITMENT**

FARMER SIGNATURE.....DATE.....

GROUP'S AUTHORISED SIGNATORY..... DATE.....

**NOTE: REFERENCES ON SPECIFICATION ON LOCAL UNITS AND SALM PRACTICES GUIDE AT GROUP LEVEL**