Project 3

Project Title 3: Determination of relative carbon sequestration capacities of common tree species with the view to participating in carbon trade arrangements

Duration: From 2008 To 2012

Project Leader: JS Epila-Otara

Research Team

Researcher Name	Responsibility	% time	Organisation
Mr J F O Esegu	Forest Genetic	20	NaFORRI
Dr D Hafashimana	Biodiversity	30	NaFORRI
Mr S Gwali	Sampling	30	NaFORRI
Prof J Obua	Forest Biology	20	MUK

Impact area: Improved farmers access to markets

Thematic area: Technology options responding to demands and markets

Background and Justification for Research

Climate change has now been proven to be real. Unfortunately, there is very little mankind can do to stop this phenomenon. But we can mitigate the causes of climate change (mitigation) and we can also learn how to live with the changes in climate (adaptation). Comparatively, the impacts of climate change are predicted to be more severe in the developing countries than in the developed countries: the difference derives from the disparity in wealth; the richer developed world is better prepared to cope with changes than the poor people in developing countries. Currently, the irony of climate change and its disproportionate impacts is that the bulk of the so-called greenhouse gases (GHG) emissions are from developed countries. However, because the impacts of climate change are transboundary, every nation in one way or another, is compelled to participate in its containment. Protocol for participating in the climate change was negotiated and agreed at in Kyoto, Japan. Among other things, Kyoto protocol (KP) agreed on an implementation process under the clean development mechanism (CDM) with two goals: to reduce greenhouse gas emissions; and to assist developing countries that host projects to achieve sustainable development (Orlando et al 2002). Under CDM, dealing with climate change should not curtail development in the poor countries as the rich countries implement activities that reduce their current GHG emissions to the 1990 levels. Carbon dioxide being the main gas of the GHGs (Anon. 2002) was selected as a standard yardstick to monitor the implementation of the Kyoto Protocol. Sale of carbon dioxide equivalent removed or prevented from getting into the atmosphere constitutes the emission reduction credits (Orlando et al 2002) that are traded in an innovative carbon market (Page 2003). Barring a new energy source or a technological breakthrough, carbon will continue to be scarcer and the price of carbon is expected to increase over time (Silva-Chavez 2005).

But carbon trade is very demanding and costly: technically, a trader in carbon market has to go through an elaborate documentation process of his merchandise: the carbon equivalent, by producing a project development document (PDD) that proves that he or she will produce the carbon equivalent (Cogen and Varilek 2003). Marketable carbon is produced in two ways: reduction of carbon emission at the source or sinking atmospheric carbon. This project

proposal addresses the problems of producing tradable carbon using trees to sink the atmospheric carbon dioxide.

Documentation in particular, makes carbon trade expensive for farmers in developing countries of Africa. Consequently, small scale African farmers have not benefited from the carbon trade as originally designed. Part of this problem is that no carbon sequestration data exist for the indigenous trees of Africa. Payment for tradable carbon sunk by indigenous trees is comparatively at higher premium. Such a premium will make carbon trade more lucrative than using exotic species that has been developed for tree growing in many African countries, including Uganda. Data obtained from this project will also assist directly in the on-going negotiation on averted GHG emissions from deforestation through compensated reduction arrangement (Santilli et al 2005).

Objectives: Establish the relative carbon sequestration capacities of selected tree species for carbon trade. Specific objectives are:

To document carbon sequestration potential of selected indigenous tree species
To develop local methodology for estimating baseline and monitoring carbon sequestration
To develop local models of PDD for advising farmers to engage in carbon trade

Expected outputs and impact

First, the successful implementation of this proposal will result in increased participation of tree growers in global carbon market. Secondly, this research will lead to the reduction of national emissions of GHG. Many outputs are expected from this project and are summarized thus:

- representative and cost effective carbon pool identified,
- documentation of carbon sequestration by selected indigenous trees and
- empowering farmers to participate in CDM processes.

Research Plan /Methodology

Methods that shall be used for measurement and data analysis for estimating carbon stocks in selected tree species are fully elaborated by IPCC (2003) and are reported in the Good Practice Guidance for LULUCF under the CDM of UNFCCC. Similarly, default data recommended in the same document shall be used in the PDD.

Activities	Year1				Year2				Year3				Year4				Year5			
	Quarters				Quarters				Quarters				Quarters				Quarters			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Determination of sequestered carbon in known plantation species	x	x	x	x	x	x														
Selection of test species						x	x	x	x	x	x	x	x	x	x					

from natural population and determination of sequestered carbon																			
Tracking carbon sequestration trend in selected species				x	x	x	x	x	x	x	x	X	x	x	x	x	x	X	x	x
Empowerment of tree farmers in CDM activities				x	x	x	x	x	x	x										

Performance indicators

Output 1. Representative and cost effective carbon pool identified

- Cost effective carbon pools for the known plantation species documented in the second year of the project
- Cost effective carbon pool for non-plantation from natural population documented in fourth year of the project

Output 2. Documentation of carbon sequestration by selected indigenous trees

- Below- and above-ground carbon stocks of the selected indigenous tree species documented by year five

Output 3. Empowerment of tree growers in CDM processes

- Between year one and three at least 250 tree farmers will have been trained in the writing of PDD and monitoring of carbon sequestration in CDM projects

Research Team: D Mujuni, D Hafashimana, S Gwali, P Okulo, M Mudoma and G Mukoya

Budget: Uganda shillings 648,530,000 only

LOGICAL FRAMEWORK

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Intervention logic	Objectively verifiable indicators	Sources and means of verification	Assumptions
Objective Establish the relative carbon sequestration capacities of selected tree species for carbon trade	• Increased use of high-carbon-value tree species in carbon trade • Increased number of participants in carbon trade	• Project reports • National survey and other government records	
Expected Outputs: **Output 1** Carbon sequestration by selected trees documented	• Below- and above-ground carbon stocks of the selected tree species documented by year five	• Report on carbon pools of both indigenous and exotic trees	
Output 2 Representative and cost effective carbon pool identified	• Cost effective carbon pools for the known plantation species documented in the second year of the project • Cost effective carbon pool for non-plantation selected indigenous tree species documented in the fourth year of the project	• Report to the Executive Board of the CDM of UNFCCC	• Accepted by both the UNFCCC national focal point person and Executive Board of UNFCCC
Output 3 Tree growers empowered in CDM processes	• Between year one and three at least 250 tree farmers will have been trained in the writing of PDD and monitoring of carbon sequestration in CDM projects	• Workshop reports on CDM	• Local authorities and government agencies willing to fully participate in sharing information

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