



MAKERERE UNIVERSITY

# **THE COST ESTIMATES FOR EMISSION REDUCTIONS (*THE WESTERN REGION OF UGANDA*)**

**Dr. Justine Namaalwa  
Assoc.Prof. Gorettie Nabanoga  
Edward Ssenyonjo**

**Makerere University**

# Presentation Outline



MAKERERE UNIVERSITY

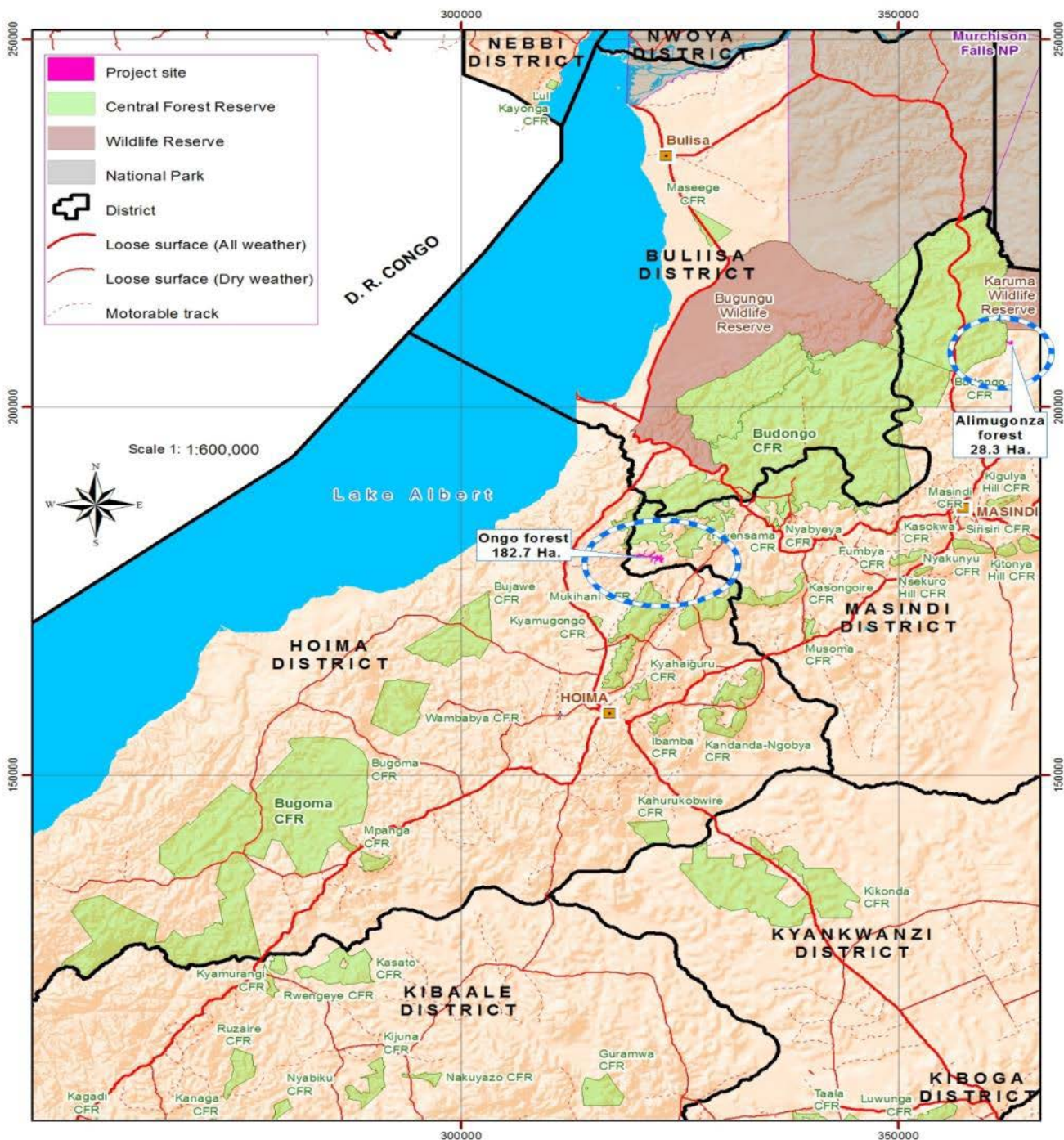
- **The Study Area**
- **Types of REDD models**
  - Payment for Ecosystem Services (PES) Scheme
  - Community-Based REDD Pilot Scheme
- **Estimation of Opportunity Costs**
  - The Focus
  - The process
  - Key considerations
  - Key results
- **Deforestation trends and the carbon stock estimates**
- **Cost Estimates for Carbon emission reductions**



# The Study Area

*(Landscape level)*

- 2 big CFRs
- 81 small FRs
- 3 wildlife reserves
- Communal forests
- Private forests
- Agricultural land





# The REDD models

1. Experimental Payment of Ecosystem Services (PES) scheme for the PFOs (*Private Forest Owners*)
2. REDD pilot for Ongo Community Forest to be implemented by Ecotrust

## **Similarities between these models**

- Both aim at making payments in exchange for undertaking mitigation activities
- Activities: Avoiding deforestation & Forest restoration

## **Differences**

- The PES scheme will pay individual farmers while the Ecotrust pilot is focused on payment to the community surrounding the forest

# Estimation of Opportunity Costs



MAKERERE UNIVERSITY

## The Focus

- The alternative uses for the forest(s)
  - Agricultural production activities



# Estimation of Opportunity Costs



MAKERERE UNIVERSITY

## The process

- Review of district level reports
- Field-based Rapid Appraisals



– Focus group discussions

– Key informants

- PFOs, Forest management committee members, Farmers (6per crop)

# Estimation of Opportunity Costs



MAKERERE UNIVERSITY

## Key considerations

- Land use trajectories = 20 years
  - Start with high return crops; change to lower value crops after 4-6 year
  - following a piece of land that has been under continuous cultivations (6-8 years)
    - depending on availability of alternative land for cultivation
- Yields
  - 2010 values considered as the base values for future projections
  - Declining yields- *a constant reduction factor of 10% was assumed (less Tobacco & Sugarcane)*
- Prices - Farm gate prices
- Labour- both hired and family
- Discount rate-
  - 25% reflects the average lending rate (2009/2010)
  - Alternative discount rates of 10% and 15% were applied for sensitivity analyses and to also reflect possible lending rates for rural savings schemes.

# Estimation of Opportunity Costs-

## Key results



MAKERERE UNIVERSITY

### Main Crop Rotations

Option 1	Option 2	Option 3	Option 4
<b>Tobacco</b>	<b>Rice</b>	<b>Tobacco</b>	<b>Maize</b>
Beans	<b>Rice</b>	Beans	Beans
<b>Tobacco</b>	<b>Rice</b>	Tobacco	<b>Maize</b>
Beans	Maize	Maize	Groundnuts
Maize	Beans	Ground nuts	<b>Maize</b>
Ground nuts	Ground nuts	Maize	Beans
Maize	Maize	Beans	Potatoes
Ground nuts	Cassava	<b>Sugarcane</b>	Beans
Cassava	Cassava	Sugarcane	Cassava
Cassava	Cassava	Sugarcane	Cassava
Cassava	Cassava	Sugarcane	Cassava
<b>Fallow</b>	<b>Fallow</b>	<b>Fallow</b>	<b>Fallow</b>





# Estimation of Opportunity Costs-Key results

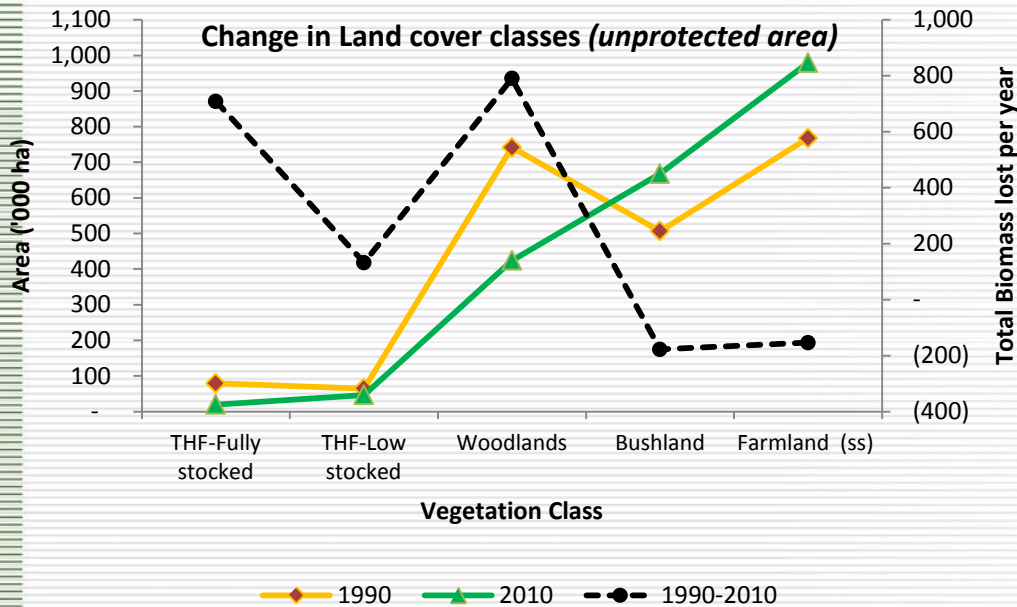
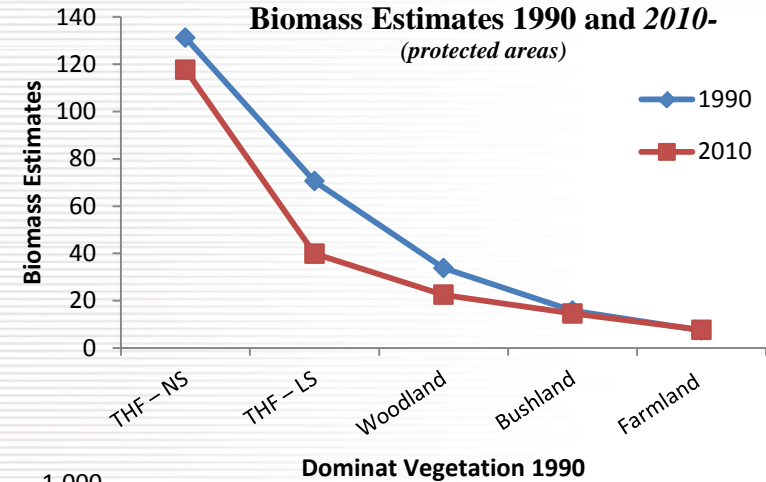
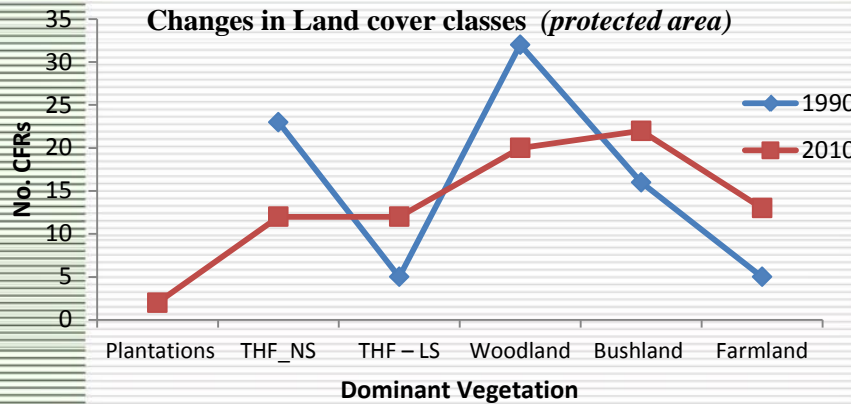
Cropping cycle	High value crop	NPV (USD/ha)		
		25%	18%	12%
Option 1	Tobacco & Maize	1,307	1,440	1,583
Option 2	Rice & Maize	1,121	1,255	1,355
Option 3	Tobacco & Sugarcane	1,255	1,457	1,648
Option 4	Maize	803	913	1,034
<b>Average</b>		<b>1,122</b>	<b>1,266</b>	<b>1,405</b>

- **Options 1-3** -gave relatively high estimates due to the nature of the crops
- **Average values for Option 4-** are comparable with the estimates
  - for Tanzania (Maize = key crop) =USD 942/ha
  - Earlier studies in Uganda (maize & beans) = USD 913/ha for declining crop yields

# Deforestation trends and the carbon stock estimates



MAKERERE UNIVERSITY



# Estimates for Carbon emission reductions



MAKERERE UNIVERSITY

Vegetation classification	Estimates for the year 2010			<i>NBS range Estimates (tons/ha)</i>	tCO <sub>2</sub> e/ha	
	Area ('000 ha)	Total Biomass estimates ('000 tons)	Mean Biomass estimates tons/ha		Study estimates (Yr 2010)	Other studies
<b>Plantations</b>	18	459	26.2		<b>48.0</b>	
<b>THF-Fully stocked</b>	50	9,507	189.3	<i>154-328</i>	<b>347.1</b>	<i>240</i>
<b>THF-Low stocked</b>	70	5,757	81.7	<i>38.9 - 154</i>	<b>149.9</b>	<i>89</i>
<b>Woodlands</b>	463	15,359	33.2		<b>60.8</b>	
<b>Farmland (SS)</b>	1,008	11,162	11.1	<i>4.8-31.8</i>	<b>20.3</b>	<i>16</i>

# Estimates for Costs for est. Carbon emission reductions



MAKERERE UNIVERSITY

Vegetation class	tCO2e/ha	Emissions/ conversion	Costs for Emission reductions (US\$ /tCO2e/ha)		
			US\$ 3	US\$ 5	US\$ 8
<b>THF-Fully stocked</b>	347.1	326.8	980	1634	2614
<b>THF-Low stocked</b>	149.9	129.5	389	648	1036
<b>Woodlands</b>	60.8	40.5	122	203	324
<b>Farmland (SS)</b>	20.3				
<b>NPV for agriculture (USD/ha at 25%dr)</b>	<i>Option 1</i>	<i>Option 2</i>	<i>Option 3</i>	<i>Option 4</i>	<i>Average</i>
	<b>1,307</b>	<b>1,121</b>	<b>1,255</b>	<b>803</b>	<b>1,122</b>



**THANK YOU FOR YOUR  
ATTENTION**