Identifying Factors Affecting Non Industrial Private Forest Landowners' Preference for Forest Carbon Sequestration in the Southern United States

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A. Introduction

Forests can contribute to green house gases concentration reduction by sequestering atmospheric carbon in their biomass and soil; and the sequestered carbon can remain stored in wood products made from the harvested trees for extended periods. Forest management and afforestation initiatives alone could store additional 1.2 billion tCO_2e per year in the US while the Southern United States has the potential to sequester over 400 million tCO_2e per year (Galik et.al. 2013). Thus, this region where the private ownership is particularly strong could have a crucial role for a successful forest carbon sequestration initiative. However, factors affecting the private forestland owners' preference for forest carbon sequestration management in this region are still less understood.

B. Objective

Identifying factors affecting NIPF landowners' preference for carbon sequestration in the Southern United States.

C. Method

Data
A mail survey of NIPF landowners will be conducted to understand the factors affecting their preference for forest carbon sequestration.

Research design
About 5,000 of the NIPFs with > 100 acres of forestland will be randomly selected for the mail survey from a list of NIPF owners in the southern region. The number of samples per state will depend on the relative proportion of the NIPFs with ≥ 100 acres in each state. Only PINEMAP participating states will be selected for this survey.

Survey instrument
The survey will follow the tailored design method recommended by Dillman (2000). The questionnaire will consist of four sections: forestland characteristics, climate change perception, carbon sequestration attitude, and socio-economic details.

Sequestration scenarios
The landowners will indicate their preference for carbon sequestration by indicating their preference to joint management scenarios in comparison to a baseline scenario (timber only) of loblolly pine plantation in 100 acres for 35 years. Their preference measure will be analyzed using an ordered logit model.

D. Preliminary Results

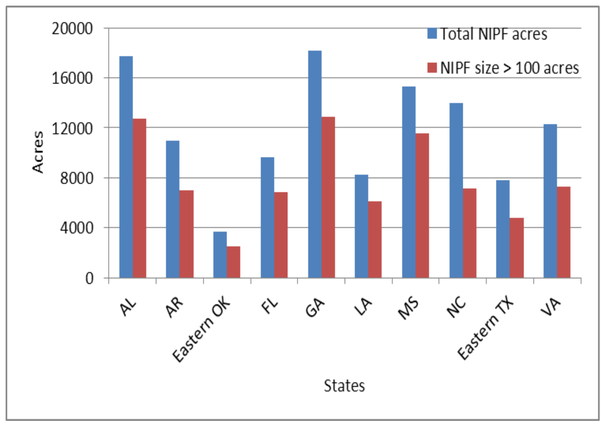

Figure 1: Acres of forestland (in '000) owned by NIPFs in the Southern United States (Butler 2006)

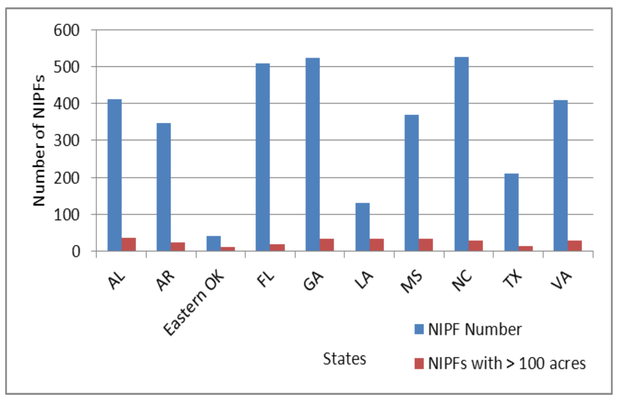

Figure 2: Number of NIPFs (in '000) with greater than 100 acres in the Southern United States (Butler 2006)

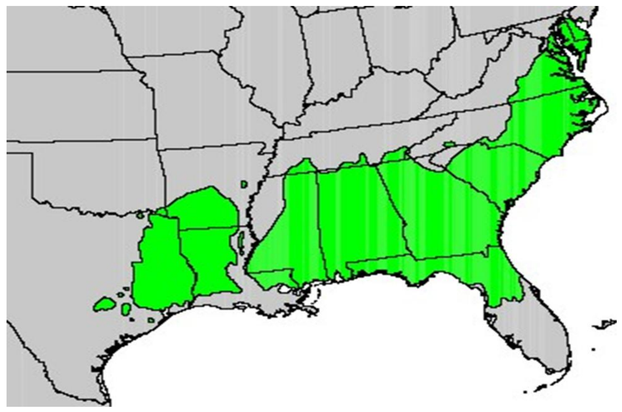

Figure 3: Loblolly pine distribution in the Southern United States

A. Net return to landowners at different stand ages
The net return to landowners from joint management (timber and carbon) of loblolly pine would differ with stand ages. It turns negative after age 35 at carbon price of $10/$CO_2e$.

Table 1: Net present value (NPV) from timber only and joint management of loblolly stand at different stand ages and carbon price of $10/$CO_2e$ (Nepal 2011)

		Net Present Values (NPV) $/ac		
Stand Age	CO_2e Accumulated	Timber only	Joint Management	Net Change from Joint
25	486	955	1233	-
30	594	1306	1704	471
35	659	1361	1840	136
40	689	1231	1744	- 96
45	715	1059	1595	- 149
50	736	1044	1437	- 158

Sequestration scenarios
The landowners will have a choice of either to manage forestland for timber only, or manage it jointly for timber and carbon sequestration. Because of the uncertainty in carbon market, any additional revenue from carbon trade would depend on the market conditions after 35 years from now. The landowner will indicate their preference for scenario 2, 3, and 4 compared to the baseline scenario.

Baseline scenario: This is a standard timber only management practice. The landowner will receive a NPV of $1,361/acre for timber only management until 2048.

Scenario 1(high carbon price): The same stand will now jointly managed for timber and carbon sequestration. The landowner could receive a NPV of $1,840/ acre for joint management until 2048.

Scenario 2 (Moderate carbon price): This is a variation on scenario 1. The landowner could receive a NPV of $1,400/acre for joint management until 2048.

Scenario 3 (Low carbon price): This is another variation on scenario 1. The landowner could receive a NPV of $1,322/acre for joint management until 2048.

E. Preliminary Concluding Remarks

The landowners choice of a scenarios would depend on many factors including their risk behavior. The risk loving individuals would prefer scenario 1 even if they have possibility to find scenario 3. The risk averse could be expected to select baseline scenario.

F. Reference

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