Assessing preferences for forest carbon credit and co-benefits: A choice experiment case study in Japan

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1. Introduction

Forest carbon projects play an important role in climate mitigation by, refers to removing and storing carbon, incentivizing local communities to protect and sustainably manage forests, channeling the private sector to invest and deliver multiple benefits beyond just carbon sequestration and other co-benefits (Galatowitsch, 2009; Maguire, 2017; Vacchiano et al., 2018). However, the demand for forest carbon credit has declined due to the competition with renewable energy in the voluntary market (Ecosystem Marketplace, 2021). To increase demand, policies could suggest necessary alternatives to increase engagement in regional voluntary markets. This study investigated corporate preferences for forest carbon credit offsets as a representative area for local carbon credit potential and monetary value project's co-benefit.

2. Methodology

This study was conducted in Nagasaki Prefecture, located in the northwestern part of Kyushu, Japan. This study employed stated-preference techniques to investigate the preferences of SMEs. We conducted our survey using a questionnaire, with an overall sample of 58 SMEs. The choice experiment instrument determined 5 attributes, including the price of credit, location of forest sequestration project offset, social development on local employment, preservation of ecosystem services, and unit of sustainable development goals (SDGs). The analysis employed multinomial logit and random parameter logit (RPL) models to account for heterogeneity in preferences and their willingness to pay.

3. Result of analysis

The results showed that small and medium-sized enterprises (SMEs) held a neutral stance regarding offsetting their emissions and were categorized as being in the early stages of engagement with carbon offsetting. As SMEs can decide whether to purchase credit, we assessed their preferences for the type of credit-based forest carbon sequestration.

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SMEs had a significant preference for the location of the project, SDGs, and credit price when deciding to purchase credit based on the RPL model estimates. They were willing to pay JPY 6,191 (approximately USD 41) for the location of a project to be local rather than overseas, JPY 933 for a higher number of unit SDGs, and JPY 131 for an increase in the number of jobs.

Table : The choice model results of the multinomial and random parameter logit models

Attributes		Multinomial logit		Random parameter logit	
		Coefficients	Standard error	Coefficients	Standard error
Credit Price	Mean	-0.0001***	0.0000	-0.0001***	0.0000
	St. dev.			0.0002***	0.0001
Location	Mean	-0.4898***	0.0567	-0.8698***	0.1696
	St. dev			0.8786***	0.1540
Local Economic Development	Mean	-0.0341	0.0413	0.0184	0.0524
	St. dev.			0.2180***	0.0568
Local Ecosystem Services	Mean	-0.0515***	0.0233	0.0083	0.0274
	St. dev.			0.0081	0.0417
SDGs	Mean	0.0665*	0.0340	0.1311***	0.0497
	St. dev.			0.1734***	0.0522
Obs.		1,860		1,860	
Pseudo R^2		0.0578		0.1184	
Log-Likelihood		-1,215.9796		-523.3320	
AIC		2,443.959		1,066.664	
BIC		2,477.136		1,121.947	

４．結論

This study highlights that the strong preferences toward forest carbon credits are based on location, SDGs, local economic development, and credit price. Corporations form their preferences for forest carbon credit based on the current state of decarbonization. The WTP value determined in this study reflects the affordability of credit, which corporations prefer, and quantifies the value of co-benefits in a hypothetical market scenario. Despite the intrinsic drive and subtle external influence of stakeholders, these features of forest carbon credit are important to consider when designing local carbon credit schemes. . This study is of crucial value to corporations seeking alternative climate mitigation strategies and practitioners developing forest management strategies to generate cost-efficient offset credit projects.

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