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Motivation

Problem: Few landowners want to participate in PES

❑ PES works on **voluntary basis**.

❑ Inducing landowners to voluntarily adopt a new land use practice is **difficult**.

❑ Inducing landowners to voluntarily adopt a new land use practice + conditionalities in the contract is **more difficult!**

❑ **Contractuality** and **Conditionality** characteristics seem to be problematic.

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Research Questions

❑ What are program attributes that influence landowners' decisions to participate in a proposed PES program?

❑ How much is the marginal Willingness-To-Accept (WTA) for each of the program attributes that influences the landowners' decisions?

❑ How much is the Willingness-To-Accept (WTA) required to encourage participation for any particular PES scheme?

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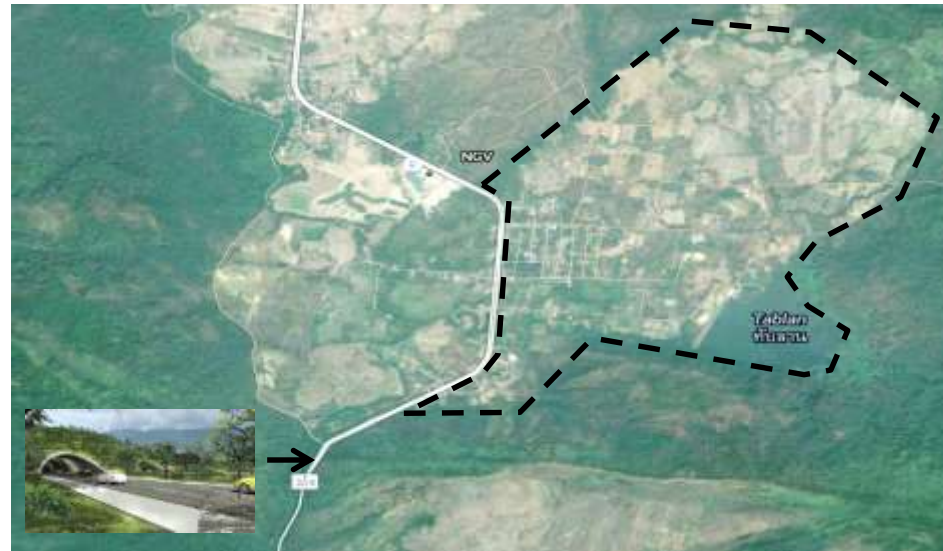Research Questions
About this Paper

About this Paper

❑ An application of choice experiment method in the design of PES program in the context of developing countries.

❑ The simple "Conditional logit" model is used to analyze landowners' preferences for the hypothetical program factors.

❑ Landowners' preferences are presumably homogenous.

❑ Unrealistic? Still, informative!

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About this Paper

❑ The paper empirically provides information regarding landowners' preferences and potential costs for future PES program to be implemented in the study area.

❑ One of the few studies, to my knowledge, that have done so in the developing country context.

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A Case Study

A Case Study

❑ The Enhancing the Economics of Biodiversity and Ecosystem Services in Thailand and South-East Asia project (ECO-BEST).
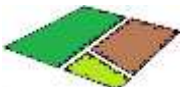
❑ 200 plots of agricultural land covering 402 ha.

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CE: Selection of Attributes and Levels
An Example
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Summary Statistics

NIDA
WISDOM for Change
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CE: Selection of Attributes and Levels

Attribute	Levels	Expected impact
New land use practice	Chemical-free farming; Leasing the land to the project	Negative
Length of the contract	1 year; 3 years; 5 years; 7 years	Negative
Minimum amount of land to be enrolled	50% of eligible land; Freely chosen, but no less than 1 rai (0.16 ha) [1]	Positive
Non-monetary incentive	Not provided; Free of charge technical assistance and advisory services; Free of charge ecotourism-related job training for second source of income; Group of participants choose how to invest	Positive
Monetary incentive (THB/Rai/Year)	THB 300; THB 500; THB 700; THB 900 [2]	Positive

❑ Initially identified based on evidence from the literature.

❑ Refinement was carried out by means of focus group discussions and rounds of pretesting surveys.

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An Example

Project A	Terms & Conditions	Project B	Current land use
	New land use practice		
Leasing the land to the project		Chemical-free farming	
	Length of the contract		
7 years		3 years	
	Minimum amount of land enrolled		Your current land use
Minimum 50% of eligible land		Free to choose	
	Non-monetary Incentive	Free of charge ecotourism-related job training for second source of income	
Group of participants choose how to invest			
	Monetary incentive		
700 THB/Rai/Year		500 THB/Rai/Year	

Had both Project A and Project B been the other two land use options available before you decided to apply current land use, which option would you have most likely chosen?
(Please check one and only one box)

☐ Project A
☐ Project B
☐ I would have still chosen my current land use

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❑ On-site, face-to-face interview

❑ 92 landowners interviewed (173 heads of household invited)

❑ Final sample, N = 78

❑ Choice observations = 78 respondents x 8 choice sets = 624

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Summary Statistics

Description	Mean	Std. Dev.
Age (years)	57	13
Sex (proportion of female)	0.57	-
Number of members in household	3	2
Farm size (hectares)	1.88	1.69
Perceived on-farm annual profit per hectare (USD)	318.86	514.47
Calculated on-farm annual profit per hectare (USD)	156.70	863.80
Non-farm annual income (USD)	4427	5337
Proportion of on-farm annual income to total annual income (%)	15%	20%

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Land use	Hectares	Proportion
For rent*	66.84	0.406
Cassava	38.20	0.232
Maize	1.28	0.008
Banana	5.00	0.030
Other fruits (e.g. mangosteen, pomelo, rambutan, marian plum)	11.84	0.072
Rice (both in-season and off-season)	6.16	0.037
Other crops (e.g. basil, rough giant bamboo, sacha inchi, etc.)	9.08	0.055
Eucalyptus	8.64	0.053
Non-use	2.8	0.017
Total	164.56	1.000

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Estimation

❑ Random Utility Maximization (RUM) model

❑ $U_j = V_j + \square_j = \sum_{k=1}^{K} \beta_k \cdot x_{jk} + \square_j$

❑ Conditional logit model

❑ $\square$ is assumed to be independently and identically (I.I.D.) *Type-I* extreme value distributed.

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❑ Base models

Attribute	Model 1		Model 2	
	Coefficient	Std. Error	Coefficient	Std. Error
PTICE	-0.32764***	0.05296	-0.32516***	0.05293
LOC	-0.12905***	0.02809	-0.12759***	0.02807
ENROL	0.17243***	0.05222	0.17396***	0.05227
INKIND_FLEX	-0.04179	0.10054	-0.03083	0.10128
INKIND_ECOT	0.16088	0.10178	0.17036*	0.10253
INKIND_ADVI	0.23074**	0.09976	0.21116**	0.09990
CASH	0.00424***	0.00138	0.00430***	0.00140
ASCSQ	0.00725	0.19884	-1.32320**	0.54355
ASCSQ x AGE	-	-	0.02764***	0.00749
ASCSQ x % CASSAVA	-	-	0.57151**	0.23220
ASCSQ x NON-LAND USER	-	-	0.50208*	0.26464
ASCSQ x SUCCESSOR	-	-	0.31001***	0.09769

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❑ Attribute's Marginal WTA

Attribute	Considered level	Base level [a]	Model 2	
			WTA	S.E.
PTICE	Renting out the land	Chemical-free farming	75.6629***	26.92761
LOC	For yearly increment	-	29.6892***	10.53850
ENROL	50% of eligible land	Freely chosen	40.4783**	18.08542
INKIND_FLEX	Not provided	Provided	-7.17464	23.63834
INKIND_ECOT	Not provided	Provided	39.641	25.63010
INKIND_ADVI	Not provided	Provided	49.1349*	27.23044

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❑ WTA estimates (per hectare, per year) for particular combinations of program attributes

Length of contract	Advisory services	Min. land enrolled	Chemical-free farming (USD)	Land leasing (USD)
1 year	No	Free	-42.9513	108.375
1 year	Yes	Free	-141.221 → **Participation goal**	
5 years	No	50%		308.088 → **Environmental goal**

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Conclusion

❑ **Land use practices** impact participation decisions the most.

❑ Landowners' desirable PES program **differ strikingly from** program manager's one.

❑ **Higher payments** may help induce landowners to participate in PES programs that would generate higher environmental benefits.

❑ **Older** landowners, those with a **higher proportion of land for growing cassava**, **non-land users**, and those **having successors** all tended to want to continue with their current land use.

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❑ Policy makers or program managers are recommended to:

➢ **Trade off** the use of practices that generate higher levels of environmental benefits for a lower participation rate.

➢ **Nonetheless, higher payments** could be offered to induce landowners to participate in the more environmental benefits PES scheme.

➢ **Provide in-kind benefits** in addition to the monetary incentives so as to motivate landowners to participate in a PES program and reduce the contract costs.