Using Choice Modelling to estimate PES scheme benefits in Lao PDR

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Context

- Payments for environmental services (PES) scheme in Lao PDR

Context

- Environmental service:

  - Wildlife protection in the Phou Chomvoy Provincial Protected Area

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Context

- Buyers of wildlife protection:

  - International tourists and urban population of Vientiane

Data collection

Focus groups & pilots

↓

Personal interviews

Survey on wildlife protection
in the Phou Chomvoy Provincial Protected Area
(Lao and English version)

← 20 choice sets (Sb-efficient design)
(5 choice sets per respondent)

Urban population of Vientiane
Sample size: n = 257 (229)
Response rate: 49.1%

International tourists (airport)
Sample size: n = 355 (337)
Response rate: 74.2%

Survey material

- Questionnaire (script)

- Show cards

- Choice booklets and envelopes

- Answer sheets

- Google earth app (for Lao population survey)

Choice set example

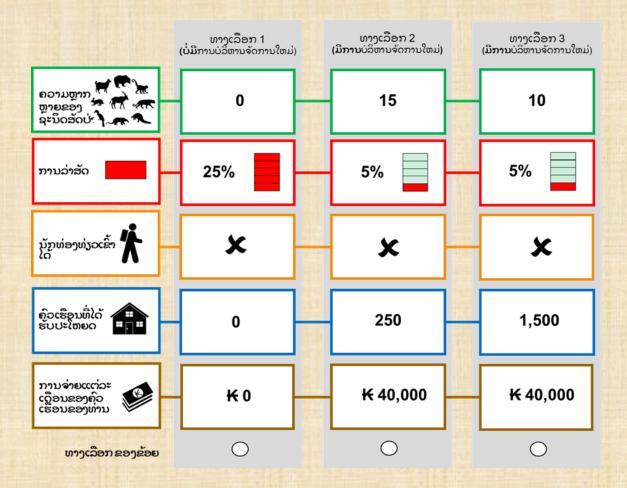|	Option 1 (No new management actions)	Option 2 (New management actions)	Option 3 (New management actions)
Species diversity	0	10	10
Poaching	25%	20%	15%
Tourist access	✗	✗	✗
Benefitting households	0	1,000	250
Tourist levy	US$ 0	US$ 10	US$ 50
My choice:	○	○	○

Choice set example

Results (international tourists)

Mixed logit panel error component model

Variable	Coefficient	p-value	Standard error
Paramter			
species	0.03666***	0.0014	0.01149
poaching	-0.03213***	0.0080	0.01212
access	0.22481***	0.0012	0.06965
households	0.00050***	<0.0001	0.00006
costs	-0.03352***	<0.0001	0.00287
income	0.01127**	0.0476	0.00569
education	1.31682*	0.0594	0.69855
constant	1.62914*	0.0632	0.87686
sigma	2.92889***	<0.0001	0.32752
Model statistics			
N (observations)	1715		
LL_β	-1299.82041		
χ^2,9	1111.47150	<0.00001	
Mcfadden pseudo ρ^2adj	0.29949		
AIC/N	1.55		

***=significant at 1% level, **=significant at 5% level, *=significant at 10% level

Results (international tourists)

Attribute	Implicit price/ one-off	p-value	95% confidence interval
species	US$ 1.09/ species***	0.0011	US$ 0.43 - US$ 1.75
poaching	US$ 0.96/ %***	0.0033	US$ 0.33 - US$ 1.60
access	US$ 13.42/ access***	0.0028	US$ 4.60 - US$ 22.22
households	US$ 0.015/ household***	<0.0001	US$ 0.011 - US$ 0.018

***=significant at 1% level, **=significant at 5% level, *=significant at 10% level

Results (urban Lao population)

Mixed logit panel error component model

Variable	Coefficient	p-value	Standard error
Paramter			
species	0.02042*	0.0831	0.01178
poaching	-0.04223***	0.0023	0.01383
access	0.20046***	0.0010	0.06097
households	0.00034**	0.0121	0.00014
costs	-0.03360***	<0.001	0.00525
income	0.12490*	0.0777	0.07080
education	1.96096**	0.0272	0.88814
constant	1.70027**	0.0168	0.71138
sigma	-3.66700***	<0.001	0.52167
Model statistics			
N (observations)	1010		
LL_β	-853.66886		
$\chi^2,9$	503.07020		
Mcfadden pseudo ρ^2adj	0.22760		
AIC/N	1.715		

***=significant at 1% level, **=significant at 5% level, *=significant at 10% level

Results (urban Lao population)

Attribute	Implicit price/ month	p-value	95% confidence interval
species	US$ 0.07/ species*	0.0591	US$ -0.003 - US$ 0.15
poaching	US$ 0.15/ %***	0.0002	US$ 0.07 - US$ 0.23
access	US$ 1.43/ access***	0.0001	US$ 0.73 - US$ 2.13
households	US$ 0.001/ household***	0.0012	US$ 0.0005 - US$ 0.0020

***=significant at 1% level, **=significant at 5% level, *=significant at 10% level

Use of estimated PES benefits

- Marginal benefits of wildlife protection (together with corresponding estimated marginal costs) used to estimate a 'market' price per unit of wildlife protection

- Marginal benefits of wildlife protection will be used to estimate the extent of a suggested tourist levy to fund wildlife protection in Laos sustainably

- Marginal benefits of having access to the Protected Area could be included if basic tourist infrastructure was established

- Marginal benefits of community support will be used to estimate the extent of payments to the village funds

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Project: "Effective implementation of payments for environmental services in Lao PDR"