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Using Choice Modelling to estimate PES scheme benefits in Lao PDR

Gabriela Scheufele, Marit Kragt, Phouphet Kyophilavong, Michael Burton, and
Jeff Bennett

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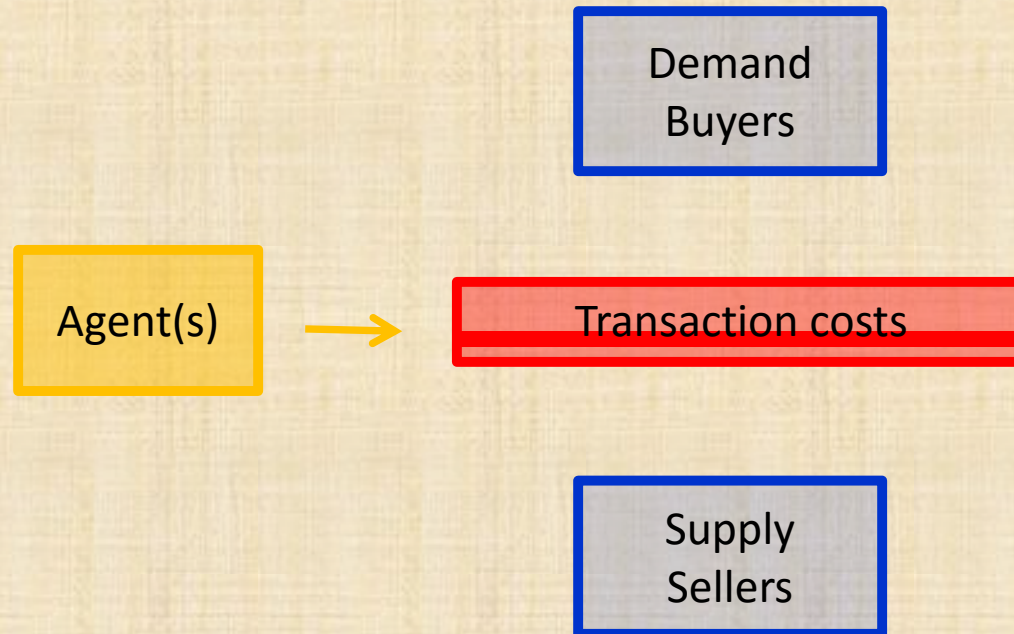
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'AARES Canberra'
February, 2016

Context

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



Context

- Environmental service:
 - Wildlife protection in the Phou Chomvoy Provincial Protected Area



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	X	X	X
Benefitting households	0	1,000	250
Tourist levy	US\$ 0	US\$ 10	US\$ 50
My choice:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Choice set example

	ທາງເລືອກ 1 (ບໍ່ມີການບໍລິຫານຈັດການໃຫມ່)	ທາງເລືອກ 2 (ມີການບໍລິຫານຈັດການໃຫມ່)	ທາງເລືອກ 3 (ມີການບໍລິຫານຈັດການໃຫມ່)
ຄວາມຫຼາກ ຫຼາຍຂອງ ຊະນິດສັດປ່າ	0	15	10
ການລ່າສັດ	25%	5%	5%
ນັກທ່ອງທ່ຽວເຂົ້າ ໄດ້	X	X	X
ຄົວເຮືອນທີ່ໄດ້ ຮັບປະໂຫຍດ	0	250	1,500
ການຈ່າຍແຕ່ລະ ເດືອນຂອງຄົວ ເຮືອນຂອງທ່ານ	₭ 0	₭ 40,000	₭ 40,000
ທາງເລືອກຂອງຂ້ອຍ	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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 p ² adj	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^2_{adj}	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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