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Using Choice Modelling to estimate PES scheme benefits in Lao PDR

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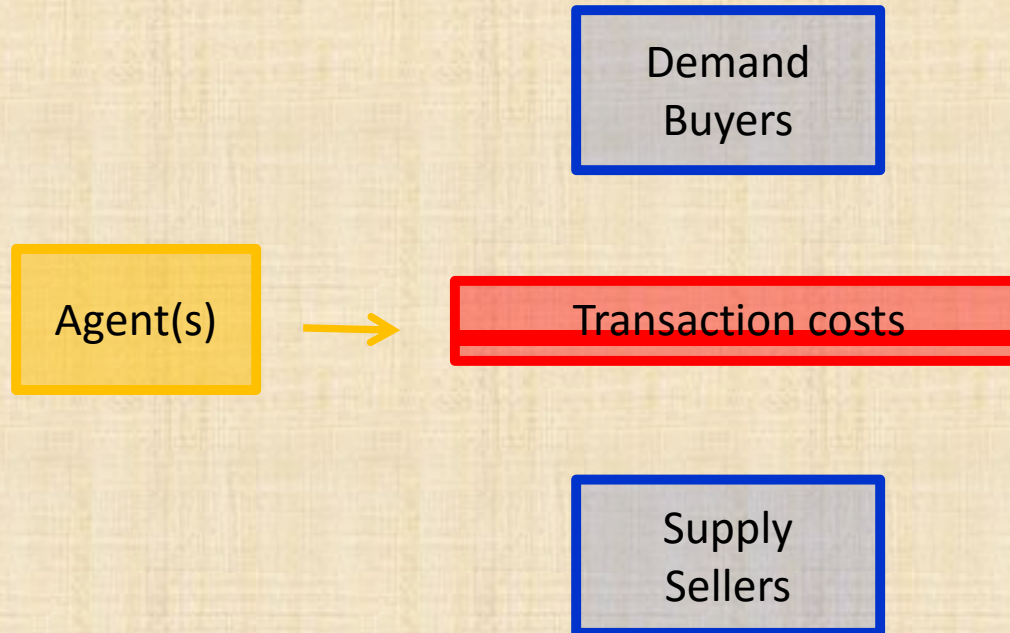
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'AARES Canberra'
February, 2016

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%



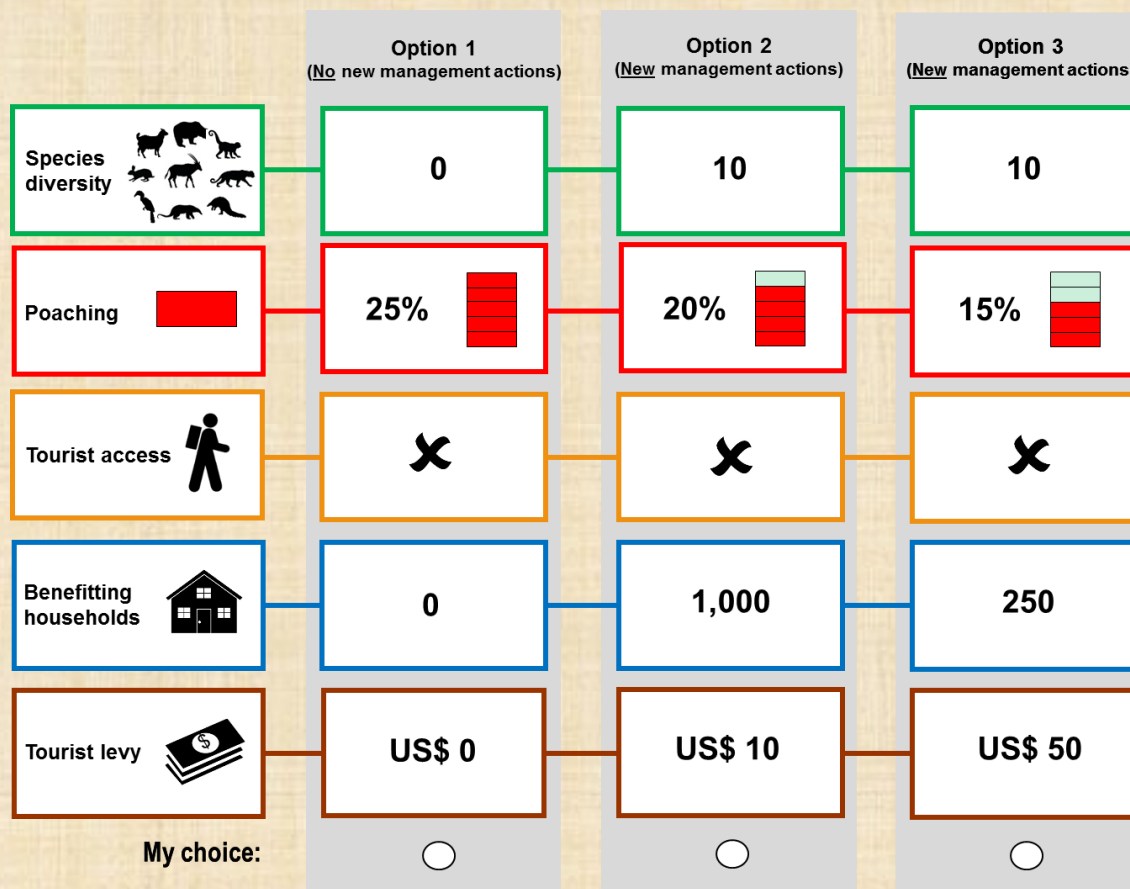
International tourists (airport)
Sample size: n = 355 (337)
Response rate: 74.2%



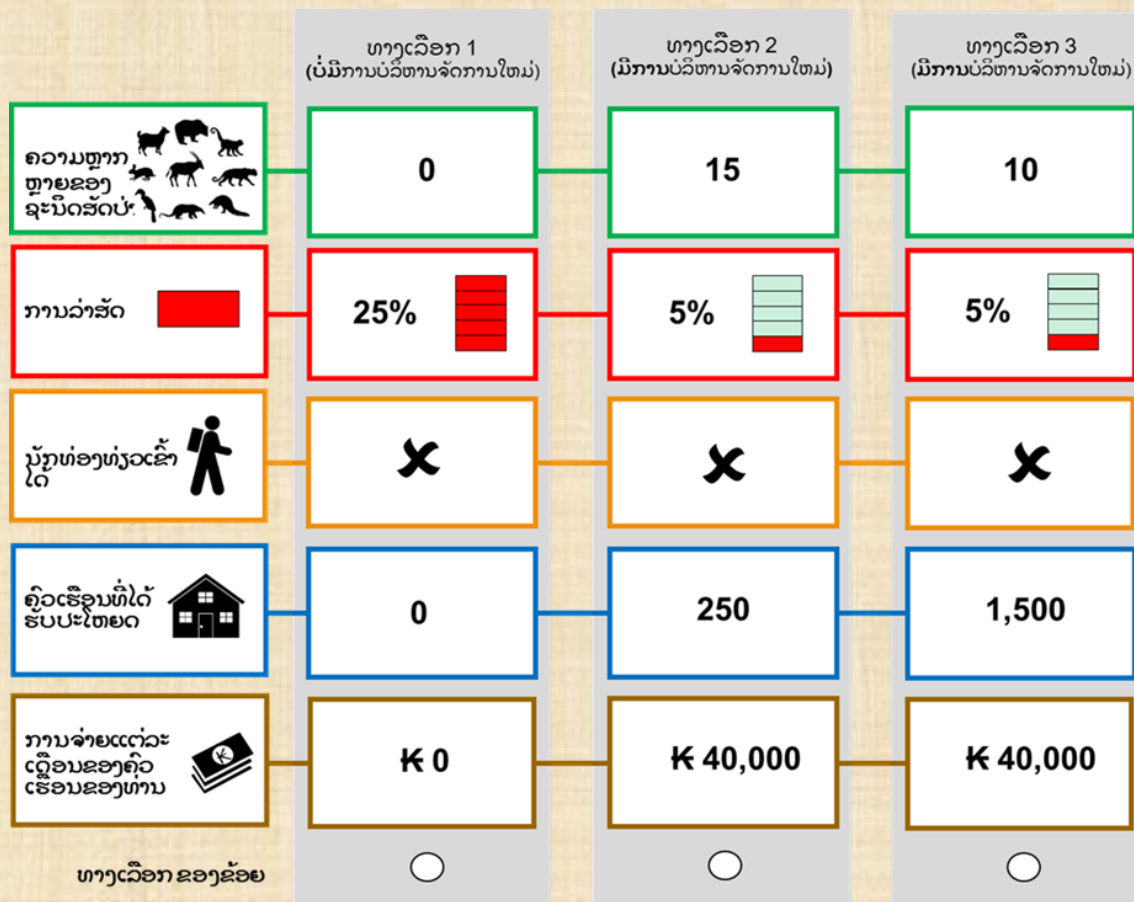
Survey material

- Questionnaire (script)
- Show cards
- Choice booklets and envelopes
- Answer sheets
- Google earth app (for Lao population survey)

Choice set example



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 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 | | |
| χ 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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