

Mobilizing Resources for Marine Turtle Conservation in Asia

A Cross-country Perspective

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This article reports the results of a comparative study conducted in China, the Philippines, Thailand and Vietnam to assess households' willingness to pay for marine turtle conservation and the potential to mobilize funds. Results show that imposing even a modest mandatory surcharge on residential electricity bills would not pass a referendum. This suggests that many people place a low priority on marine turtle conservation compared to other public policy issues. Nevertheless, there is some potential for voluntary contributions, though mobilizing these also presents problems. Until Asia develops higher per capita incomes and trustworthy payment vehicles, the international community will need to play an important role in financing conservation in the region.

Keywords: willingness-to-pay, marine turtles conservation, contingent valuation, cross country perspective

I. Introduction

Marine turtles are important, not only for their economic and intrinsic value, but because the presence of an adequate population of marine turtles is often an indicator of healthy marine ecosystem (Perrine 2003).

Of the seven species of marine turtles, four are classified by the International Union for the Conservation of Nature and Natural Resources (IUCN) as critically endangered, while two are in the next highest risk category (IUCN 2002).

The marine turtles' status in Asia is of interest for two reasons. First, human activity in the region presents a wide variety of threats, including excessive and illegal harvesting for meat, shells, skin and eggs; habitat loss from development of beaches; destructive fishing methods such as dynamite fishing and use of drift nets; and pollution from shipping and tourism. Many of these threats are increasing rapidly with economic growth (IUCN 2002; Safina 2006). Second, marine turtles are a migratory species; their habitat

is shared among a large number of countries such as China, the Philippines, Cambodia, Thailand, Malaysia, Vietnam and Indonesia. Coordinated policies to conserve marine turtles are thus more likely to be effective than those pursued by countries on their own. There is evidence of willingness of countries in East and Southeast Asia to collaborate but so far the measures taken have not been adequate to the challenge.¹

This paper reports the results of a comparative research project carried out in China, Thailand, the Philippines and Vietnam. It explored the prospects for increased regional or national efforts to conserve marine turtles in Asia; whether Asians value turtles more for their use as food, shells, etc., than for non-use values; whether Asians are aware of marine turtles and their plight; and whether there is sufficient local willingness to pay to support larger conservation efforts.

Using a common survey instrument, we applied the contingent valuation method (CVM) to assess the willingness of local populations to pay for the conservation of marine turtles. We estimated local willingness to pay and explored how a variety of payment vehicles affected people's decisions to support national and regional conservation plans. The survey instrument included an extensive set of attitudinal questions that allowed us to assess the relationship between respondents' attitudes, socioeconomic characteristics, and willingness to pay.

The surveys were administered by dropping off questionnaires at people's residences, using similar procedures and protocols in each study

country. Altogether 3,680 respondents participated in the survey; these were randomly selected spreading across all administrative districts in Beijing, Ho Chi Minh City, Hanoi, Bangkok and Davao City. The most populous of these cities is Beijing with over 15 million people; the smallest is Davao City in the Philippines, with about 1 million. Average annual per capita income ranges from US\$540 for Ho Chi Minh City/Hanoi to US\$2,490 for Bangkok. There are also variations in culture and familiarity with the uses of marine turtles.

II. Attitudes towards Environment, Wildlife and Marine Turtles

We asked respondents to rank ten public policy issues: economic problems, poverty, education, health, crime/violence/inequality, government/good governance, infrastructure, environment, terrorism, and relations with other countries. The survey revealed that people in all four countries accord relatively low priority to environmental protection. Only in Beijing does it appear among people's top three concerns. (See Table 1.) While environmental concerns do not feature as priority concerns, over 70 per cent of the respondents in all four countries agree that environmental problems are not properly taken care of.

Among environmental issues, we assessed how strongly people feel about the protection of wildlife. Respondents were asked to rank nine environmental issues: air pollution, water pollution, solid waste, loss of endangered species,

TABLE 1
Social and Economic Priorities

Rank	<i>Beijing</i> <i>N = 600</i>	<i>Davao City</i> <i>N = 847</i>	<i>Bangkok</i> <i>N = 789</i>	<i>Ho Chi Minh City/Hanoi</i> <i>N = 1,444</i>
1	Economic problems	Economic problems	Economic problems	Economic problems
2	Good governance	Poverty	Poverty	Good governance
3	Environment	Good governance	Good governance	Education

NOTE: *N* = total number of respondents surveyed.

deforestation, traffic congestion, soil erosion, global warming, and destruction of coral reefs. In none of the cities did wildlife conservation appear in the top three environmental concerns. (See Table 2.) Among the top three, there are few surprises. It appears that people are primarily concerned with environmental problems that affect their daily lives.

Davao City was the only city where a non-urban issue (deforestation) ranked first, probably because it is located close to natural forests and has faced increasing incidences of flooding.

Studies have highlighted that conservation efforts for less known species have less public appeal than species that are more charismatic, cute or familiar (Tisdell and Wilson 2006). If this is the case, marine turtles may have fairly strong appeal. First, as Table 3 reveals, the marine turtle is not an obscure species. Asians are familiar with them, although they may not have seen live turtles, or consumed their meat or eggs. These are, after all, urban populations with access to television, and as our survey results suggest, this may be more important source of information about environmental issues than formal education.

Second, respondents in the five cities surveyed showed common preferences for marine turtles. The survey asked respondents to prioritize six endangered species for priority of allocation of conservation resources; the species were marine turtles, dugongs, whalesharks, Philippine eagles, black-faced spoonbills and Javan rhinos. In all cases, marine turtles were ranked either first or second (Table 4).²

However, an individual may be concerned about animals in general or specific species, without taking action to prevent their extinction. He or she may assume that someone else will or should solve the problem. There is some evidence of this in the survey results. When 57 per cent to 65 per cent of respondents strongly agree that "it is everyone's duty to ensure that plants and animals as we know them today will exist for mankind in the future", we might conclude that most people have "pro-environmental" attitudes. When making personal trade-offs, however, there is a notable drop in supporting opinions. Only 4 per cent of the respondents in Davao strongly agreed that "governments should raise taxes for more endangered species protection". The percentage of "strongly agree" in the other cities was similarly low.

III. The Potential for Private Contributions for Marine Turtle Conservation

In order to assess willingness to pay (WTP), we constructed a hypothetical marine turtle conservation programme. We provided information about the importance of marine turtles to coastal and oceans ecosystems; described the threats and risks of extinction; and introduced a hypothetical marine conservation programme. We then asked respondents whether they would be willing to contribute to the programme by paying a monthly surcharge on their electricity bills for a period of five years.

TABLE 2
Environmental Priorities

Rank	Beijing <i>N</i> = 600	Davao City <i>N</i> = 847	Bangkok <i>N</i> = 789	Ho Chi Minh City/Hanoi <i>N</i> = 1,444
1	Air pollution	Deforestation	Traffic congestion	Air pollution
2	Water pollution	Solid waste	Deforestation	Water pollution
3	Traffic congestion	Air pollution	Air pollution	Deforestation

NOTE: *N* = total number of respondents surveyed.

TABLE 3
Familiarity and Knowledge about Marine Turtles^a

	<i>Beijing</i> <i>N = 600</i>	<i>Davao City</i> <i>N = 847</i>	<i>Bangkok</i> <i>N = 789</i>	<i>Ho Chi Minh</i> <i>City/Hanoi</i> <i>N = 1,444</i>
Have you ever seen a live marine turtle?	53%	67%	57%	24%
Have you ever eaten marine turtle eggs or meat?	3%	9%	7%	2%
Have you ever purchased or owned a product made from the shell of a marine turtle?	6%	4%	10%	5%
Do you watch Discovery Channel, or <i>National Geographic</i> or any television show or video document about marine turtles or other animals?	81%	79%	98%	78%
Marine turtles have cultural value in some societies in Indonesia, Thailand, China and Malaysia (temple ceremonies, "release of life" ritual, etc.)	44%	27%	51%	45%
Marine turtles lay their eggs on land	80%	77%	85%	84%

NOTES:

- a. Figures shown are percentage of people who said "yes" and who gave correct answers to knowledge questions.
b. *N* = the total number of respondents surveyed.

TABLE 4
Ranking for Priority in Resource Allocation

<i>Rank</i>	<i>Beijing</i> <i>N=600</i>	<i>Davao City</i> <i>N = 847</i>	<i>Bangkok</i> <i>N = 789</i>	<i>Ho Chi Minh</i> <i>City/Hanoi</i> <i>N = 1,444</i>
1	Marine turtles	Marine turtles	Dugongs	Javan rhino
2	Dugongs	Philippine eagles	Marine turtle	Marine turtles
3	Whale sharks	Dugongs	Whale sharks	Dugongs

NOTE: *N* = total number of respondents surveyed.

We adopted this payment vehicle because focus group discussions conducted prior to our pre-tests and surveys revealed a distinct lack of enthusiasm for taxes as a payment vehicle. Among the

explanations offered was that people believe they are already too highly taxed or do not believe the taxes will be effectively collected or used. Distaste for taxes as a payment vehicle is a finding of many

contingent valuation studies, not only in East and Southeast Asia (Bateman et al. 2002; Champ, Boyle, and Browne 2003).

We therefore tried to assess people's willingness to pay for conservation through an alternative payment vehicle: a surcharge attached to each household's electricity bills. We looked at two variants: a mandatory charge and a voluntary charge. In the mandatory payment scheme, respondents were presented with a hypothetical referendum and asked to vote for or against a specified monthly surcharge on all household electricity bills for a period of five years. Respondents were told to assume that if more than 50 per cent voted to pass the referendum, the surcharge would be imposed on all households regardless of how they voted. In the voluntary payment scheme, respondents were asked whether they would voluntarily make a private contribution, with no assurance that anyone else would pay it.

We asked separate groups of respondents their willingness to pay for one of three marine turtle conservation packages: (i) a region-wide programme financed through a mandatory charge; (ii) a region-wide programme financed through voluntary contributions, and (iii) a national programme financed through a mandatory charge.

The region-wide programmes would involve the collaboration of many countries, including the four surveyed. In principle, the likelihood of success of the regional programme would be greater than that of a single-country programme, given the species' transboundary habitat. For the region-wide programme to be financed by the mandatory charge system, over 50 per cent of respondents in each of the four countries would have to vote in favour for the programme to be implemented. In other words, respondents were told to assume that if the referendum did not pass in one of the countries, the international effort would not go ahead.

1,249 respondents were randomly selected to respond to the region-wide programme with mandatory payment; 1,220 to the region-wide programme with voluntary payment; and 1,211 to the single-country programme with mandatory

payment. Each set of respondents was divided into five groups, each of which was asked to give a yes-or-no response to one of five amounts, or bid levels, ranging from US\$0.02 to US\$7.50 per month.³

Our findings show that, while respondents are familiar with marine turtles and believe them to be important, they are not concerned to a degree that would lead them to make personal trade-offs by making private contribution. Table 5 shows that only the lowest surcharge (US\$0.02) would pass a referendum in all four countries. For Davao City, Bangkok, Hanoi, and Ho Chi Minh City, the referendum would also pass at the next lowest bid prices which were US\$0.10, US\$0.25, and US\$0.50 respectively. The second lowest bid for Beijing was US\$0.50 and only 48 per cent of the respondents voted to pass the referendum. At bids of US\$1 and above, the referendum would not pass in any of the countries.

For each city surveyed, we found that respondents were willing to make only small payments. In the Regional Mandatory Conservation Programme, the mean WTPs for Davao City were US\$0.17/household/months and for Ho Chi Minh City and Hanoi at US\$0.83 per household per month.⁴ MWTP for the two higher income cities were US\$1.16 and US\$1.41 per household per month for Beijing and Bangkok respectively. These values are comparable to the WTP values for other species from studies in Asia.⁵

The pattern of response to the Regional Voluntary Programme in Table 6 indicates that, similar to the Mandatory Programme, the percentages of the respondents who would be willing to contribute decreases significantly as the bids get higher.

We also found no significant difference in the level of support for variations in the conservation programmes we offered. With the exception of Ho Chi Minh City/Hanoi, where results suggest that respondents would be willing to pay significantly higher for the mandatory programme, respondents in Beijing, Davao City and Bangkok appear to be indifferent. Nor were there significant differences in the MWTP between international and national scale of efforts. Again, Ho Chi Minh City/Hanoi is

TABLE 5
The Number of Respondents Saying "Yes" to Each Bid
under the Regional Mandatory Programme

<i>Bid</i> (US\$/month/hh)	<i>Beijing</i>	<i>Davao</i>	<i>Bangkok</i>	<i>Ho Chi Minh City/Hanoi</i>
(0.02)	30 (75)	32 (56)	39 (67)	78 (81)
0.10		30 (56)		
0.25			37 (66)	
0.50	19 (48)			68 (69)
(1)	16 (40)	17 (28)	20 (36)	44 (44)
2		17 (31)		
2.50			18 (33)	
(5)	8 (20)	11 (20)	7 (13)	17 (17)
7.50	2 (5)			20 (21)

NOTES:

1. The rows in bold are the three common bid values used in all four countries. However, Bids 2 and 4 are set differently.
2. Figures in parentheses are percentages of "Yes" responses from the number of respondents in the split sample.

the exception with where the MWTP for the conservation efforts is higher for the international scale conservation efforts.⁶

One encouraging finding is that a significant percentage of respondents would voluntarily pay, regardless of whether or not other people paid. Moreover, while the estimated MWTP values presented earlier are indeed low and lower than WTP values in developed countries for endangered species, given the large income difference between the United States and the four countries surveyed, this difference in mean WTP was not unexpected. For example, the average U.S. citizen was willing to pay US\$7.50/hh/month (Loomis, Gonzalez-Caban, and Gregory 1996) for

the spotted owl and US\$2.77/hh/month for the gray-blue whale (Bulte and Van Kooten 1999). But Gross National Income per capita for a U.S. citizen in 2005 was nearly sixteen times higher than that of Thailand.⁷

Thus, even if those who agreed to make voluntary contributions are not in the majority, and are willing to make only small contributions, they do constitute a potential source of finance for conservation.

IV. Summary and Conclusions

Our study has shown that people in several cities in Southeast Asia are already exposed to abundant

TABLE 6
The Number of Respondents Saying "Yes" to Each Bid under the Regional
Voluntary Programme

<i>Bid</i> (US\$/month/hh)	<i>Beijing</i>	<i>Davao</i>	<i>Bangkok</i>	<i>Ho Chi Minh City/Hanoi</i>
(0.02)	29 (73)	36 (60)	42 (81)	60 (65)
0.10		38 (69)		
0.25			31 (61)	
0.50	23 (58)			60 (61)
(1)	20 (50)	18 (33)	19 (35)	27 (29)
2		17 (30)		
2.50			20 (38)	
(5)	7 (18)	11 (19)	9 (17)	20 (20)
7.50	3 (8)			11 (12)

NOTES:

1. The shaded rows are the common bid values used in all four countries. However, Bids 2 and 4 are set differently.
2. Figures in parentheses are percentages of "Yes" responses from the number of respondents in the split sample.

information, generally aware and well informed about marine turtles. They believe that conservation is important but at the moment, their priorities understandably lie in other public policy issues such as improving governance and reducing poverty. A mandatory surcharge on electricity bills to support marine turtle conservation would only pass at the lowest bid of US\$0.02 in all cities surveyed.

Our results provide some support for the proposition that voluntary contributions could provide considerable sums for marine turtle conservation.

The potential revenue, based on the percentages of respondents in the cities who would voluntarily pay US\$1 per month, would be around US\$50 million per year.⁸ This is much less than what could be mobilized were the mandatory payment referenda passed in the four countries surveyed (US\$135 million).⁹ But it is more than the current global expenditures on marine turtle conservation of 162 conservation organizations combined, estimated at some US\$20 million per year (Treung and Drews 2004).

Having said that, the harsh reality is that actually mobilizing these contributions would be

difficult. The voluntary payment vehicle we explored was a “check-off” for a marine turtle conservation programme on a household’s monthly electricity bill. While this might work once, it is not feasible to put check-off boxes on utility bills for every species or environmental cause. In the long run, these efforts must be financed primarily out of general government revenue or “user-pay” schemes like environmental service payments.

An important implication of our findings is that the traditional prescription of “raising awareness” is unlikely to yield results: people in Asia are already well informed about the existence and plight of marine turtles. Efforts to develop conservation finance mechanisms should therefore be directed in a different and more difficult

direction: improving the trustworthiness of government tax collection and expenditure systems. Conservation agencies might play a role in this by working with governments to set up trust funds in which public funds could be deposited with confidence. Charities could also explore the potential for voluntary contributions revealed by this study; their efforts should go primarily into identifying the relatively small segment of the population that is willing to contribute and to developing cost-effective ways of collecting payments. Eventually, as incomes rise and governance improves, Asia’s ability to pay for conservation will increase. In the meantime, contributions from the international community will continue to be important in conserving what is, after all, a global resource.

NOTES

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1. An example is the Turtle Islands Heritage Protected Area (THIPA) which is a transboundary protected area initiated in 1997, and has been jointly implemented by the Philippines and Malaysia.
2. The survey was conducted by dropping off a questionnaire and information packet with each household and collecting it later. It is possible that some respondents read the entire survey instrument — including the willingness to pay question about turtle conservation — before filling out the attitudinal questions. If so, this may partially explain the high-ranking for marine turtles. But it does not explain the relatively low ranking for environmental issues and for wildlife conservation among environmental issues. So we have some confidence that the high priority accorded to marine turtles is not an artifact of the survey instrument.
3. For details of the methodology of this study, the parametrics and non-parametrics analysis, see Indab et al. (2006).
4. The results are from parametric estimates assuming normal distribution.
5. MWTP (Mean Willingness to Pay) for the black-faced spoonbill in Macao was estimated at 9.51 MOP (US\$1.19)/household/month (Jinjuan 2006). MWTP for Philippines’ whale sharks US\$0.50/household/month for whalesharks (Indab 2006) where as the estimated lump sum contribution to conservation measures for the Philippines eagle was US\$63/household (Harder 2006). Estimated MWTP for the Javan Rhino based on CVM

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- study conducted in Vietnam was US\$0.21/household/month (Truong 2006).
6. We asked separate groups of respondents their WTP for a national and a (larger) international programme, partly with the intention of using this as a “scope” test to see if respondents were making rational choices. However, there is reason to believe that such “external” scope tests are unrealistic; valuation is an inherently comparative process (M. Hanneman, personal communication). For this reason, we do not believe that the apparent scope-insensitivity of respondents invalidates our findings.
 7. From World Bank’s country statistics, GNI per capita for the United States in 2005 was US\$43,740.
 8. For Beijing, for example, the estimation is based on the assumption that 50 per cent of 5.12 million households in Beijing would pay (50 per cent being the percentage of respondents in our survey who agreed to voluntary contribution of US\$1 per month). Similar approach was used for Davao City and Bangkok. The voluntary contributions for the other cities were estimated using the percentages of respondents agreeing to voluntarily contribute US\$1 per month, that is, 33 per cent of the 0.23 million households in Davao City, 35 per cent of the 2.091 million households in Bangkok and 29 per cent of 2.75 million households in Ho Chi Minh City and Hanoi.
 9. Estimated by using the MWTP for each city and the estimated number of households in each city.

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