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Payment vehicle as an instrument to elicit economic demand for conservation

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ABSTRACT

In this study we applied collective/mandatory and individual/voluntary payment vehicles to elicit public claim for governmental investments of urban coastal nature reserves; to verify the efficiency of either payment formats to recall protest voters declared under the other and sensitivity of respondents to reveal willingness to pay-WTP for maintenance and conservation of reserves. Results showed higher WTP bids and valuation under collective and mandatory payment format and supplied evidence that in developing countries people nurture expectancy on governmental actions and funding to conserve natural landscapes. The difference between the non-use values estimated under the two payment vehicles was USD 3.5 millions. For the purpose of this study, this indicates the amount claimed by local people for governmental investment in the coastal urban nature reserves. Ecological knowledge on the reserves have a positive effect on non-use values, underlining the role of information to increase people understanding on benefits supplied by nature reserve and to enable them to declared the utility attributed to these areas in economic terms.

1. Introduction

In the last four decades a number of actions and public policies has emerged the number and size of protected areas, widening governmental investments to biodiversity protection. Notwithstanding global biodiversity is declining and many other strategies have been applied in an attempted to decrease the biodiversity loss rate (Butchart et al., 2010).

Economic valuation of natural capital has been increasingly undertaken to guide decision-making on conservation (TEEB, 2010) and on economic policy (Birdir et al., 2013). Given that there is a stated trend to accept that no price means no value (Jakobsson and Dragun, 2001), natural resources pricing has a role to inform on conservation economic benefits and to highlight that protected areas are not worthless.

Recently substantial technical innovation has been incorporated to natural resources valuation methods, giving support to the challenge of identify the method to better estimate the economic value of an environmental asset and to the challenge of understand the effect of this valuation to the conservation and management of natural resources (Jakobsson and Dragun, 2001).

One of the most widely used methods is contingent valuation which is a stated preference method and the only that estimates non-use values for natural resources without take into account current or futures uses. Contingent valuation method has been widely discussed in the literature, reaching more than 2 000 researches published in the first 35 years of the method development (Carson, 2000). This method is based on the elaboration of hypothetical markets that simulate the change on the natural resource provision, aiming to stimulate people to state their preferences under the resource variation scenarios, in a similar way that choices would be done by consumers in real market (Carson, 2000; Hoyos et al., 2009; Whitehead and Rose, 2009).

Currently, discussions focusing in the criteria to acquire more consistent results (Bateman and Turner, 1992; Carson, 2000) and in the payment vehicle used in the hypothetical market (Berrens et al., 2002; Champ and Bishop, 2001) have adjusted the technique to the intended objectives and improved the estimates. Concerning on the payment vehicle, a debate has arisen over whether different methodological approaches assess the efficiency of either collective and mandatory or individual and voluntary payment to achieve conservation goals (Wiser, 2007) and to avoid bias such as strategic behavior (when interviewee declares false willingness to pay to

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skip the payment), protest votes and unwillingness to pay (Ivehammar, 2009; Morrison et al., 2000).

The choice for the payment vehicle may also guide the decision-makers toward efficient and acceptable environmental actions, since each method may provide an overview on citizens demand for environmental conservation before the statement of any management decision (Morrison et al., 2000). Further, preferences revealed can indicate the expectation of citizens concerning to their uncertainty on conservation programs (Voltaire et al., 2013).

Thus, a number of studies have investigated payment vehicle effects (Campos et al., 2007; Champ and Bishop, 2001; Ivehammar, 2009; Wiser, 2007) but not many studies have investigated on the sensitivity of WTP to whether payments have to be made collectively or voluntarily (Stithou and Scarpa, 2012). Further, literature does not provide investigation on how the private or public perception on these vehicles affects the WTP and none study has related the people's perception of public taxes paid to the claimed governmental investments on conservation.

In this study individual voluntary payment vehicle (as donation) and collective and mandatory payment were applied aiming to verify how these formats can be used to guide conservation decisions and investments, having three urban coastal nature reserve as study site. Therefore, the individual contribution has the character of private investment while the collective payment delegates to the public managers the responsibility in assure conservation in urban natural areas, improving urban well-being.

A literature overview indicates that when both payment choices are presented, respondents in general state higher WTP in the collective payment format (see Bateman et al., 1995; Champ et al., 2002; Green et al., 1994; Jakobsson and Dragun, 2001; Wiser, 2007). The trends of higher WTP in collective and mandatory payment vehicles can be explained by 'free-riding' concept. This mechanisms dictates that once many individuals are able to contribute in voluntary payment scheme, many will skip of paying, since they believe that others will pay for the public good provision (Wiser, 2007). Nonetheless, evidence exists in the literature that compulsory and collective payments may produce lower WTP (Stithou and Scarpa, 2012) and other three studies showed no significant difference between the individual and voluntary payment and the collective and mandatory payment (Ajzen et al., 1996; Babb and Sherr, 1975; Milon, 1989: all cited in Stithou and Scarpa, 2012). Diversely, the lower WTP at collective payment format may be attributed to the strategic behavior and incentive compatibility. Accordingly, the voluntary payment may not be incentive compatible, because it provides no incentives for truthful demand revelation and under a hypothetical context the individual would overstate WTP to ensure actual provision of the potentially desirable public good in question (Stithou and Scarpa, 2012; Wiser, 2007).

Apart from determining WTP for the conservation of coastal urban nature reserves, this paper explores the use of collective and mandatory or individual and voluntary payment vehicle to explore people's demand by public investment in conservation and to stimulate the protest voters to declare their real economic value attributed to the environmental asset. Further, the paper investigates the difference in bids produced by private and public payment vehicles, given that the private format is individual and the public is collective.

2. Methods and data

2.1. Study site

For the purpose of this investigation interviewees were enquired on their willingness to pay by urban coastal nature reserves. We used three coastal nature reserves in Natal city, in Rio Grande do Norte State to data sampling. Natal is a touristic spot located in the northeastern of Brazil coast. The city has 1 699 km^2 and total population of 803 739 in habitants (IBGE, 2013) settled by 36 neighborhoods. Less than 30% of urban area is constituted by natural reserves (SEMURB, 2010). The larger urban coastal nature reserve, the Park of Dunes, is bordering the ocean and has 1 172 ha. This was the first state reserve to be created and is also the largest urban natural park over dunes in Brazil (IDEMA, 2013). Recreational activities in this reserve include trekking with guides all over the park, walking or jogging in the administration area and attendance to the opened concerts on Sunday's summer. The medium size reserve, known as Park of Jenipabu has 800 ha and is the only with access to the ocean. Jenipabu is the most touristic spot due to availability of recreational activities as buggy rides, trekking with guides, dromedary or horses rides and sunset watching. The small reserve, the Park of City, has 64 ha and was established by the City Hall (SEMURB, 2008). This last one has ocean view and has not been opened to recreational activities since the reserve creation due to local political disputes, despite the pleasant natural landscape and the logistic structure created. Dunes, patches of Atlantic forest, coastal lakes and sandbank vegetation (restinga) are the natural landscape in all reserves (SEMURB, 2009; IDEMA, 2013).

2.2. Questionnaire design and the payment vehicles

A questionnaire comprised by open-ended questions was used to collect information on socioeconomic characteristics of interviewees, ecological knowledge on the reserves and questions addressing hypothetical market in the willingness to pay method, as follows. The first part consisted of general information on the interviewee such as age, literacy and local of living. The second part contained questions that informed the degree of familiarity of interviewees with the reserves, hypothetical market was elaborated using as elicitation method the open-ended survey, allowing interviewees to reveal his/her willingness to pay by the means of free bids (Serôa da Motta, 1998). Before asking on willingness to pay, each respondent was informed on ecological features of the reserves, their importance in the urban ecosystem and the upcoming threats due to unplanned urban expansion and to the planned projects for urban mobility for FIFA World Cup at 2014 in Brazil. Respondents revealed their willingness to pay for management, conservation and use of these urban coastal natural areas through two payment vehicles: i. a collective mandatory fee – in which the interviewees were asked to indicate if he/she would be favorable to the application of part of the monthly Municipal Property Tax paid, hereafter MPT, with the aim of support management, conservation and use of urban natural reserves only. In case of agreement, he/she was asked to indicate the proportion of MPT should be fairly invested to the purpose aforementioned; and ii. by means of a monthly donation to a Non Governmental Agency – NGO that would be in charge of manage and conserve the nature reserves.

The Municipal Property Tax is an annual duty stated by Federal Constitution in 1988 to supply urban safety and welfare and likewise, environmental equilibrium. Despite being considered annual, MPT full value is paid in a monthly basis, turning the effect of this payment similar to the monthly donation requested to the NGO. The value of this tax is determined by the sale price of each property multiplied by a factor ranging from 0.6 (poorer neighborhood) to 1.0. Sale price is defined according to the characteristics of the property, features of the land where the dwelling is settled and whether the use is residential, commercial, industrial or essential services, like schools and hospitals.

The two alternative payment vehicles were applied to assess citizens' claim for public liability in the conservation of the urban