

Willingness to pay for conserving marine ecosystem services and character of individuals: a case study in Japan

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Marine ecosystem services are invisible in most cases. In order to make the invisible value visible and explore possible relationships between people's value of marine ecosystem services and character of individuals, multi-disciplinary approach are taken using environmental economics and social psychology. In exploring the relationships, this study takes up two distinct marine ecosystem services as representing visible and invisible ones, that is, provision of fisheries resources and absorption of carbon dioxide in the atmosphere by ocean. A nation-wide online survey was conducted to residents in Japan in 2016. Value of respective marine ecosystem services are estimated as people's willingness to pay for conserving them by conjoint analysis, whereas character of individuals are investigated with three foci, namely public spirit, connection to others both human and non-human, and locus of control based on responses to the online questionnaires from 1,891 residents in Japan. In the survey, respondents were divided into two groups, one provided with a scenario of scientific forecast of decrease of fisheries resources and increase of carbon dioxide in the atmosphere because of deterioration of absorption function by the ocean in 10 years after, and the other provided with a scenario of that in 100 years after to compare possible differences of their willingness to pay for a near future where they are still alive and a future where they are no more alive. Respondents' marginal willingness to pay for 1% prevention of decrease of fisheries resources is 17.1 Japanese yen, whereas that for 1% prevention of increase of carbon dioxide is 32.1 for a scenario for 10 years after, which can be interpreted that they would value invisible marine ecosystem services higher than visible ones. For a scenario for 100 years after, the marginal willingness to pay for both marine ecosystem services are higher than the ones for 10 years after, which would be an implication of respondents' public spirit that could be extended to others even beyond time of their living. Based on hierarchical cluster analysis, respondents are categorized into six groups with similar preferences to marine ecosystems services for both scenarios, respectively. For the scenario for 10 years after, one group composed of 180 respondents has no willingness to pay for conserving marine ecosystem services, whereas another group composed of 108 respondents has positive utility in paying for conserving marine ecosystem services. And for the scenario for 100 years after, one group with 165 respondents has no willingness to pay for conserving marine ecosystem services, whereas another group composed of 130 respondents has positive utility in paying for conserving marine ecosystem services. In total, 345 respondents which equals to 18% of respondents are free riders, whereas 238 respondents, around 13% of respondents have positive utility in paying for conserving marine ecosystem services. Groups having no willingness to pay for conserving marine ecosystem services are characterized as extremely poor public spirit with low connection to other people and low belief in the invisible. On the other hand, there are no clear relationships between locus of control and willingness to pay for conserving marine ecosystem services. The findings of this study could provide a clue in choosing measures and targets to solicit people's support to conserve marine ecosystem services.

Keywords: marine ecosystem services, value, willingness to pay, invisible, public spirit, connection