

# Recreation Value in Enclosed Coastal Sea in Terms of Willingness to Pay for Water Quality Improvement

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The seaside of urban area has been almost occupied by the industry activity and harbor activity. The citizens desire recreational use but there is less seashore which they can access freely to. The water quality is still inferior for bathing in the enclosed coastal sea. Therefore, citizens do not satisfy water-related recreational activity and they want to ameliorate the water quality. Osaka bay area has some recreation zone sometimes with facilities as aquarium and it shows less than 10 % of accessibility. The water body of this bay has been eutrophicated in summer season and its water quality is not suitable for swimming. The sewer construction is an effective method for water quality management in the enclosed coastal sea. But it needs expensive cost to establish high performance of reducing pollutant load derived from all over the basin. The water quality improvement brings additional benefits of attractive recreations in the seaside. Citizens become willing to pay required money participant to water quality improvement cost voluntary or as the admission fee.

In this study, a questionnaire was done in order to investigate the semantic evaluation of water quality by citizens and willingness to pay for water quality improvement suitable to recreational use in the coast of Osaka bay. The study has foci on following four points of categories for monetary disaggregate evaluation as below ;

- a) three types of recreational zone ; 1) natural and artificial bathing places, 2) fishing parks and vella-vista, 3) natural parks and bird sanctuaries,
- b) the residence areas divided by the distance from seashore line of Osaka bay,
- c) two types of questions about present value of water environment in recreational zone designed for each people with and without experience of visit in last season,
- d) in contingent valuation method, two different levels of water quality ; the present state and ameliorated level for comfortable swimming,

The option price, bequest price, vicarious price and existence price of aquatic environment with each water quality level are estimated using of the travel cost method (TCM) and the contingent valuation method (CVM). The total payment by all residents in Osaka bay area was estimated.

The citizens evaluate the water quality by observing clearness of water. The regression analysis shows the relationship between clearness and other water indices such as turbidity, COD and nutrients in sea water. The reduction of pollutant load in order to achieve the quality level for swimming was calculated using the load-receptor model for water quality simulation. The additional construction cost of sewer system needed to reduce the load was estimated and compared to the total willingness-to-pay amount for water quality improvement.