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ECONOMIC VALUATION OF VILLAGE TANK SYSTEMS OF HAMBANTOTA DISTRICT: TOWARDS DEVELOPMENT OF AN INCENTIVE MECHANISM FOR THEIR CONTINUITY

BY

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Thesis submitted to the University of Sri Jayawardenepura for the award of the Degree of Master of Philosophy in Environmental Economics

DECLARATION

"The work described in this thesis was carried out by me under the supervision of Dr. U.A.D.P. Gunawardene of Department of Forestry and Environmental Sciences, University of Sri Jayawardenepura and a report on this has not been submitted in whole or in part to any university or any other institution for another Degree/Diploma".

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LIST OF ABBREVIATIONS

ARTI	Agrarian Research and Training Institute
CAA	Catchment Area of Cascade
COA	Total Command Area
CV	Compensation Variation
CS	Consumer Surplus
CV	Contingent Valuation
CVM	Contingent Valuation Method
DAS	Department of Agrarian Services
DAD	Department of Agrarian Development
DCS	Department of Census and Statistics
DS	Divisional Secretariat
EV	Equivalent Variation
FAO	Food and Agriculture Organization of United Nations
FO	Farmer Organization
FC	Farmer Company
GN	Grama Niladri
HDI	Human Development Index
HPI	Human Poverty Index
ID	Irrigation Department
IMD	Irrigation Management Division
IIMI	International Irrigation Management Institute

IUCN	World Conservation Union
INMAS	Integrated Management of Agricultural Schemes
KOISP	Kirindi Oya Irrigation Settlement Project
MANIS	Management of Irrigation Schemes
MASL	Mahaweli Authority of Sri Lanka
MCS	Marshalian Consumer Surplus
MT	Metric Tons
NIRP	National Irrigation Rehabilitation Project
O & M	Operation and Maintenance
PMC	Private Marginal Cost
PMB	Private Marginal Benefit
SMC	Social Marginal Cost
SMB	Social Marginal Benefit
TA	Technical Assistant
TEV	Total Economic Value
TVP	Total Value Product
TECO	Territorial Civil Engineering Organization
UNDP	United Nations Development Programme
VIRP	Village Irrigation Rehabilitation Project
VMP	Value of Marginal Product
WTP	Willingness to Pay
WTA	Willingness to Accept

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To

My Loving Parents & Teachers

Economic Valuation of Village Tank Systems of Hambantota District: Towards Development of an Incentive Mechanism for their Continuity

E.B.I. Dayananda

ABSTRACT

Village tanks of Sri Lanka play an important role in socio-economic development of the country. There are thousands of farm families who receive multiple benefits from these tank systems. However, being a public property, some of the goods and services provided by a tank system hardly receive any value as they are not traded in markets, and are not closely related to any marketed goods. Therefore, this study tries to value the direct benefits of these man made assets and to develop an incentive mechanism for the sustainable use of these resources. The Total Economic Value (TEV) concept was the basis for the valuation of tank benefits.

To measure the direct use values, residual imputation approach, market price approach, opportunity cost method and contingent valuation method were used. 175 households who live adjacent to the selected 10 village tanks of Hambantota district were interviewed using a pre-tested questionnaire. Further, officers of relevant government institutes of the district and officials of the farmer organizations were also interviewed. Field survey was done in the *maha* season of 2005/2006.

The total economic value of direct uses of tank was estimated as Rs. 65,840 in the isolated tanks and Rs. 80,155 in cascade tanks per household per year. The results of contingent valuation method indicated that respondents are willing to pay 1% of their average annual income for the recreational benefits of the tank. Furthermore, it is interesting to find out that, the non-irrigation value of a village tank is greater than the irrigation value. In the case of cascade tanks that is 81% and in the case of isolated tanks that is 86%. The estimated tank benefits were then compared with tank rehabilitation cost in order to derive relevant policy implications. Results of the cost-benefit analysis indicated that rehabilitation of village tanks is economically feasible if multiple benefits are generated.

Among the ecosystem functions supported by village tanks, ground water recharge was investigated in the study. There is a correlation between distance from the tank to well and the depth to the water level of the tank. Furthermore, tank ecosystems are habitats for four threatened fauna species. Furthermore, the forest area of a tank catchment is a carbon store worth Rs. 3.3 million.

Market failure, policy failure and institutional failure are the main reasons behind tank degradation while poverty, climatic factors and growth of population are also contributing to the deterioration of the tank systems. The study concludes that the best interventions for continuity of tanks be the; better use of social capital, the empowerment of farmer organizations through a catalyst, use of an integrated approach in tank management and granting subsidies to paddy farming.