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**Title of Thesis: Economic Valuation of an Urban Wetland – A Case Study of Dal Lake in Jammu and Kashmir**

### **Abstract**

Wetlands have justly been described as the most productive ecosystems which provide a number of services. Some of these services constitute ecological foundations of life on earth and are, therefore, all embracing. Besides the keystone functions and services wetlands also provide direct and indirect use values. In second half of the last century economists changed the perceptions of the prior people (considered wetlands as waste lands and waste sinks) by quantifying economic importance of wetlands using standard valuation techniques. By the end of the century empirical studies demonstrated that wetlands produce large amount of food for a great variety of animal species and are found most productive systems in the world (Falendra 2009). Despite their premier place in the community of ecosystems, wetlands have been grossly degraded due to ignorance and demographic pressure. Their open-accessed nature further leads to undervaluation and over-use. It has been estimated that at some locations 50% of wetlands have been lost since 1900 and also greater percentage area of Ramsar-listed wetlands had shrunk or were threatened by ecological change mainly caused by drainage for agriculture, settlement, urbanization, pollution and hunting etc. (Finlayson et al. 2005). Despite the relevance and justification of various Command/Control Measures and implementation of various Conservational Programs/Projects, these have proved inadequate in arresting the ever increasing degradation of wetlands. Among various proposed alternatives, the valuation of wetlands is favoured as an effective policy instrument and a potent means for raising awareness about the dangers inherent in their degradation or destruction of wetlands.

Sustainable use and conservation of wetland resources is presently a main policy challenge particularly in developing countries like India. Similar conflict exists in people's attitude towards the Dal Lake in Jammu and Kashmir. This leads to inefficient resource allocation of lake. Thus quantifying their values and productive capacities assumes significance. This may serve as a base for raising social awareness and educating people. Against this backdrop present study is an attempt to estimate economic value of Dal Lake in terms of: *annual recreational value to onsite visitors; direct benefits from its provisional services and conservation values of the lake to dwellers*. Primary data were generated by conducting two surveys from July, 2013 to October, 2013 - One for visitors to the site and second for households living in and around the Lake.

Following from the retrospective literature we employed widely preferred methods for achieving set objectives. Travel Cost Model (TCM) was used to estimate recreational value. A recreational demand function (or Trip Generation Function) was created to determine impact of various socio-economic characteristics and factors like travel cost, travel distance from home to site,

time cost on number of visits. For estimating recreational demand function three econometric models were used viz. Poisson Regression Model with Maximum likelihood Estimation (MLE), Poisson Regression Model with Pseudo-Maximum likelihood Estimation (PMLE) and Truncated Poisson Regression Model. Direct Market Price Method (DMPM) and Substitute Price Approach were used to estimate benefits derived from direct uses by dwellers from the lake, viz. vegetative production, fish production, fodder collection and tourism services. For estimating dwellers willingness to pay for conservation of lake, Contingent Valuation Method (CVM) was employed and then Binary Logistic Model (BLM) was used for estimation of equations.

***The major findings from the study are:***

- Similar to Indian wetlands of the Himalayan Range, Dal Lake possesses potential Use Values such as recreational values and other Provisional Services. These generate income and employment for the local people;
- From TCM estimates total welfare gain (consumer's surplus) of Dal Lake was found to be Rs. 63 crores per-annum given a tourist inflow of 126013 to lake (MoT J&K, 2013 and Economic Survey, J&K 2013-14). This considerable recreational value of the lake indicates its importance as a tourist destination;
- It was found that travel cost & travel distance are highly significant and have negative relationship with number of visit to the Site.
- Inferences from TCM suggest that developing alternative means of transport and moderating other facilities like accommodation, food etc. for accessing this site can considerably decrease travel cost leading to an increase in visit frequency. This in turn will increase state revenue;
- Some dwellers derive their income from the Dal Lake through multiple sources such as; vegetative production, fishing, and tourism activities. It implied that majority of the dwellers were directly dependent on Dal Lake;
- Gross Annual Direct Use Benefits of Dal Lake to local People (using DMP Method) were estimated to the tune of Rs. 46.92 crores per-annum. This suggested that lake has a potential use value and, therefore, needs protection from over-utilization;
- Majority of respondents/dwellers 99% were not satisfied with present situation of the lake. According to them, main reasons for its degradation are drains, outlets around its periphery, excessive fishing and tourist garbage;
- People's Willingness to Pay (WTP) for improvement of Dal Lake depended on various socio-economic and behavioral characteristics of the respondents.
- Mean WTP for the improvement of overall environment of Dal Lake was found as Rs. 338 which is relatively higher than other studies like Preshars et al., (2006) and Bhatt et al. (2014);
- Total WTP of the households, living in and around the lake, worked out to be Rs.21, 92,944 which implied that given local population's dependence on wetland resources, people want that the lake should be conserved and maintained;