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Designation :

Title : *Analytical Simulation of Dynamic Interdependency between Economy and Lotic Ecology at the Meandering River Basin*

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Human beings consume lotic fish not only for self metabolic processes but also for trading purposes. Thus the potential of river for fish production does not solely depend on the characteristics of river. Meandering processes have hydrodynamic impacts on the habitation of lotic species. On the other hand livelihoods of capture fishers depend on the abundance of lotic fish in rivers. Accordingly, the study was accomplished in the Kaliganga river and its basin at Ghior upazila in Manikganj district through interdisciplinary research methodology.

Initially an eco-fluvial model was prepared using MATLAB 7.1 software by encoding flow, sediment transport and bank erosion models following the methodology of Chen and Duan (2006) for the Kaliganga river. Verification of the model was executed by comparing outcomes with those of Nagata et al. (2000). After identifying dynamic location of deeper pools near concave bank from model outcomes comparing with satellite images, the probability of habitation formation for indicator species *Sperata aor* (Ayre) was estimated on the basis of water level data.

The outcomes were also compatible with outcomes at HEC EFM 2.0 software and LGED (2006) report. Though it was estimated that the Kaliganga river had potential for more fish production, the production could not cope up with population demand. Field survey identified that overconsumption significantly caused depletion of lotic fish. The study showed that overconsumption is resulted from indebted conditions or poor savings of capture fishers because of uncertainties in income, regular interest of loans though seasonally varied income, soaring up basic expenditures and social and institutional constraints.

The study investigated into the livelihood of capture fishers. Their income was idealized the converted economic values of ecological resources and then distributed into the society by their consumption expenditures. Based on Keynesian hypothesis, an income consumption model using questionnaire survey data was prepared and the hypothesis for regression analysis was tested statistically in SPSS 12.0 software. The model exhibited that capture fishers have to spend at least BDT 409 even if they have no income. Moreover marginal propensity to saving (MPS) is only BDT 0.06 whereas marginal propensity to consume (MPC) is 0.94.

Though higher MPC indicated higher multiplier effect (16.67) in local economy, negligible MPS is threatening their sustenance in the long run. The sustainability of lotic fish, therefore, depends on the consumption manner of capture fishers and the sustenance of capture fishers depend on the availability of lotic fish. Obtaining such dynamic interdependency, the objectives of present research indicate that economics should be considered within ecological study for planning the sustainability of lotic ecosystem.