

# Economic Valuation of Ecosystem Services of River and Human Well-being in Developing Countries: A Research Direction



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## Introduction

Human well-being of a country directly and indirectly depends upon ecosystem services due to several reasons. Humanity are getting wide range of benefits such as pure water, food, wood, clean air, medicine, drugs and others from ecosystems services or natural resources (i.e. land, water, forest, river, soil). The ecosystem services also include air, biota, water, forest product, livestock, soil, mineral, fuel wood, non-timber, urban forest tree and others. Aforementioned services are the fruits of nature which can be directly consumed and used in production activities to meet the human needs [1]. The ecosystem services, therefore, are extremely important for human well-being and provide direct and indirect benefits to people [2]. Furthermore, protection of ecosystem services creates the path to achieve sustainable development [3]. The ecosystems goods and services are helpful to maintain human welfare, thus degradation of quantity of ecosystem may have negative impact on socioeconomic activities [4,5]. Hence, there is essential to estimate the economic value of existing ecosystem services which will be supportive to formulate a specific policy to conserve ecosystem services in developing and developed countries. As quantity of ecosystem services and biodiversity are being adversely affected due to rapid urbanization, population growth, higher industrialization, and overuse of natural resources in production activities at world-wide. Climatic factors (e.g. increasing temperature, fluctuation in rainfall pattern, and frequency of floods and drought, deforestation, soil erosion, salinization etc.) are also caused to increase additional burden on ecosystem services. As ecosystem services are declining day by day due to aforesaid activities, thus the economic valuation of ecosystem goods and services may be useful for sustainability of ecosystem services in future. However, valuation of ecosystem services is controversial issue due to high diversity in availability of ecosystem services, and its values depend upon public opinion and willingness to pay ability of people [1,2]. Furthermore, most

ecosystem services have the nature of public goods, therefore everyone have the equal right to utilize it's to maintain their livelihood security. The valuation of ecosystem goods and services, therefore, are controversial issue among the ecological scientist, economist, and policy maker due to aforesaid reasons [2]. Also, the valuation of ecosystem services includes various components like ecological (e.g. complexity and geographical location), socio-culture (e.g. equity, identity), and economic value (e.g. monetary term) [3]. Hence, there is requirement to integrate all above-mentioned components into an interdisciplinary framework to measure the economic value of ecosystem services [3]. However, a group of researchers have argued that valuation process of ecosystem services is based on multiple values, perspectives and institutional contexts that may have different values (e.g. justice, knowledge, equality etc.). Appropriate valuation of ecosystem service, therefore, cannot be translated into a single value.

Despite the above-mentioned debate, the several researchers have developed several methods to examine the economic value of ecosystem services and its association with social and economic benefits in developed and developing countries. Hence, it is very crucial to identify that how changes in the quantity and quality of ecosystem services may have a significant impact on human well-being and welfare. In this regard previous studies have argued that there is a scarcity of natural resources like water, soil, forest, plants, mineral and others. Hence, there is compulsory to enhance the conservation, proactive protection and precautionary actions, and sustainable use of natural resources in production activities at world-wide [3]. As the economic value of ecosystem services varies across regions, geographical location and depends upon the quantity and quality of ecosystem services. A group of researchers have argued that economic valuation of ecosystems services is difficult due to that most ecosystem services are public goods and markets cannot provide appropriate prices for these

[1]. Also, there is a serious concern on selection of universally acceptable method to valuation of ecosystem services. Therefore, economic value of ecosystem service may not be generalized at micro level to global level. Although earlier studies have estimated the economic value of ecosystem services of a particular goods or services in different economies. Most studies have claimed that ecosystem services are necessary to maintain human wellbeing, and sustainability of ecosystem goods and service.

The ecosystem services of rivers play a significant role for social, culture, economic development, and prosperity of populations. River ecosystem services provides many benefits to human, including water supply for municipal, industrial, and agricultural users, fish habitat, aesthetic, and recreation [2]. River ecosystem service build a way for dilution of wastewater, erosion control and water purification effects from riparian vegetation and wetlands that is useful to improve water quality [2]. The ecosystem services of river consist dynamics and interdependencies of the following components:

- River ecology
- Geomorphology
- Flora and fauna,
- People and land use development
- Agricultural interplay
- Water quality
- E-flow
- Hydropower construction

In developing economies, ecosystem service of rivers are highly vulnerable due to high dependency of population on the ecosystem services of rivers (e.g. drinking water, farming, fish rearing, agriculture etc.), and unplanned development and management of rivers, extensive water pollution and overwhelming use of water. Ecosystem services of rivers, therefore, are in high risk in most developing countries. However, in case of ecosystem services of rivers, there are many researches which must be addressed by exiting researchers and these are given below

a. What must be best method to measure the ecosystem services of river in developing economies?

b. How economic value of ecosystem services of river does affects human wellbeing in developing economies?

c. How human and socio-economic variables, policy factors and variability in climatic factors have impact on economic value of ecosystem services of rivers in developing economies?

d. What may be policy intervention for sustainability of the ecosystem services of rivers in developing economies?

Existing researchers, therefore, can be considered following objectives in further study:

a. To estimate the economic value of ecosystem services of river in developing economies. This objective would be useful to suggest that how various ecosystem services of river are necessary to increase human welfare and wellbeing.

b. To assess the influences of various socio-economic variables and government policy factors on estimated value of ecosystem services of river in developing economies. This objective would provide the empirical evidence that which variables have significant influence on value of ecosystem services of river in developing economies. This objective would suggest a viable policy implication for sustainability of ecosystem services of river in developing economies.

To suggest an integrated socially and economically acceptable, and environmentally sound strategy to conserve the ecosystem services of river in developing economies. .

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