

Economic Valuation of Kaziranga Tiger Reserve: *Value the Roar's Ecosystem*

Are ecosystems' contributions to our welfare being adequately and accurately reflected in our calculus? It is possible that our failure to depict ecological benefits in monetary terms biases social decisions towards economic activities that are antagonistic to ecological health and production. If so, greater commitment to ecosystem valuation could serve both the interests of conservation and society as a whole. This study makes a fair attempt to value the ecosystem services derived from tiger reserves, the existence of which, is crucial for man's own survival.

Summary

Less than 3500 tigers remain in the wild today with around 50 percent in India and their numbers are declining rapidly. Tigers are apex predators. Their conservation results in the conservation of all trophic levels in an ecosystem. It is high time to centre the cry of our national animal and its importance to the world. Economic valuation of tiger reserves is a novel step in the direction of drawing attention to the wide range of benefits of the ecosystems they provide. Better information on the economic value of tiger reserves will most likely provide an important incentive to allocate sufficient funds for their continued conservation and to stimulate sustainable utilization of the important functions of these areas (de Groot 1994). This study attempts to estimate the value of ecosystem services of Kaziranga Tiger Reserve through economic valuation as monetary valuation conveys the message with precision and simplicity. Kaziranga is a World Heritage Site inhabited by the world's largest population of one-horned rhinoceros. In addition, it also supports the population of tigers and elephants. It is estimated that the Kaziranga Tiger Reserve (KZTR) provides flow benefits worth ₹ 9.8 billion (147.813 million US\$) or ₹ 0.95 lakh (0.001 million US\$) per hectare annually.*

Key Findings

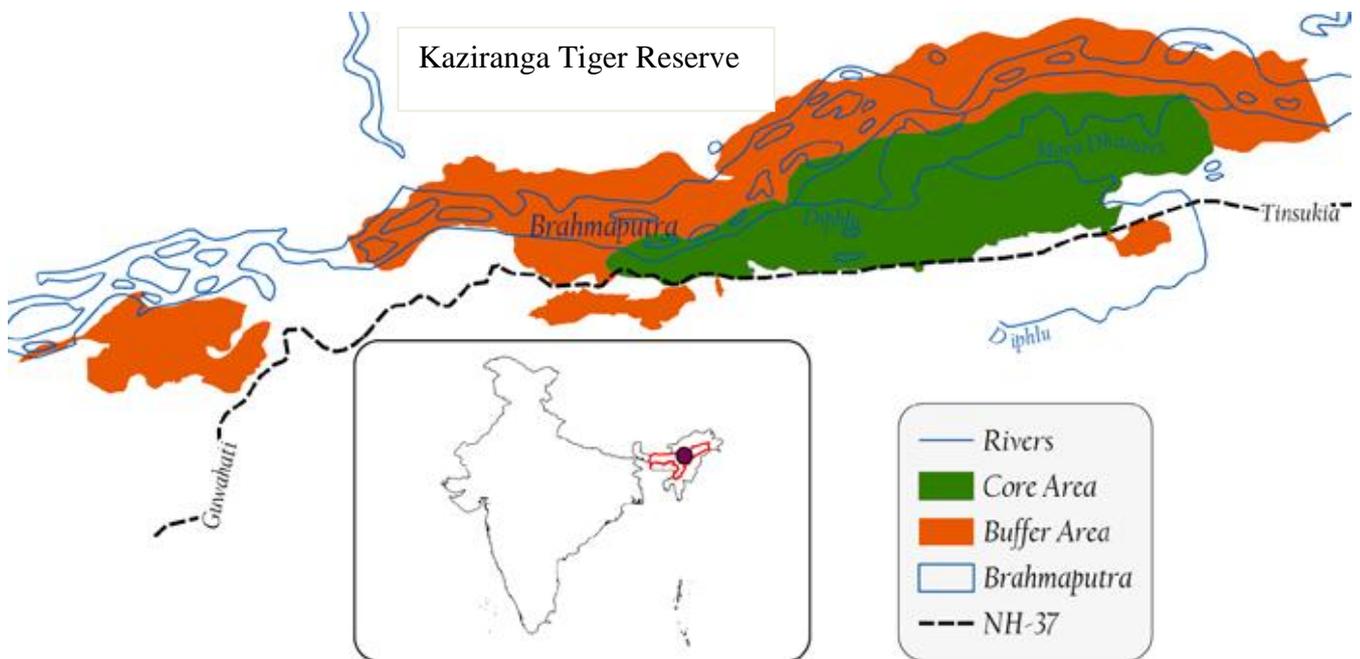
- ✦ For every rupee spent on management costs currently, flow benefits of approximately ₹200 (3.02 US\$) are realized within and outside the Kaziranga Tiger Reserve.
- ✦ Nearly 2 percent of flow benefits from KZTR accrue at the local level, 38 percent at the national level and 59 percent at the global level.
- ✦ The estimated value of the ecosystem services of KZTR is worth ₹9,755.88 million (147.148 million US\$) annually.
- ✦ A large proportion of flow benefits (as well as stock) are intangible, and hence often unaccounted for in market transactions.

Key Recommendations

- ✦ Adequate investment in tiger reserves is essential to ensure the flow of ecosystem services in future, and is economically rational.
- ✦ Intensive research is required to arrive at a value closer to the actual worth of ecosystem services prevailing in the tiger reserve and accordingly activities should be prioritized and valued like ecotourism.
- ✦ Need to integrate management of tiger reserves into the broader landscapes and enhancement of ecological connectivity among the tiger reserves and their wide environment as corridor connectivity of KZTR is crucial.

Background

In the heart of Assam, Kaziranga Tiger Reserve (KZTR) is one of the last areas in eastern India undisturbed by a human presence. It covers an area of ~1000 sq km (482 km² of core zone and 548 km² of buffer zone). KZTR is a hallmark of conservation measures used to preserve biodiversity. Floods are a regular annual feature of the tiger reserve as it is situated in the flood plains of the mighty Brahmaputra River with the entire area formed by erosion, accretion and silt deposition carried by the river systems flowing through or near it. The KZTR is known for the charismatic 'Big Five,' i.e. one-horned Rhinoceros, Asiatic Wild Buffalo, Asiatic Elephant, Swamp Deer and Royal Bengal Tiger. Kaziranga is situated in the Indo-Australian mega flyway of birds and has at least 550 different avifauna species visiting the tiger reserve. The inventory contains 25 species of global importance of which 23 are critically endangered, endangered or vulnerable. In the backdrop of the drastic decline of vultures elsewhere, the population of vultures in KZTR which contains critically endangered long-billed and slender-billed vultures has been rising up in recent times. Here, more than 40,000 people are directly associated with 33 Eco- Development Committees operating in the tiger reserve.



Key Results

Ecosystem Services from KZTR:

Besides conserving wild, tiger reserves also provide a range of associated economic, social, cultural and spiritual benefits, which are termed as ecosystem services. The study focuses on quantitative and qualitative estimates for as many as 25 ecosystem services from Kaziranga Tiger Reserve which were identified from the Millennium Ecosystem Assessment framework. The monetary estimates for the 10 services are specified in Fig 1, whereas some important values that these tiger reserves provide are difficult to capture through economic analysis like sacred values of particular places to faith groups, etc have been qualitatively assessed.

S.No.	Ecosystem Service	Value (₹ in Millions/Year)
1	Standing Stock	21,400.00
2	Gene-Pool Protection	3,490.00
3	Carbon Storage	990.00
4	Carbon Sequestration	17.37
5	Biological Control	149.72
6	Pollination	86.79
7	Habitat/ Refugia	5,730.00
8	Recreation	21.50
9	Gas Regulation	26.05
10	Waste Assimilation	234.45

Fig 1: Quantitative Assessment of Ecosystem Services of Kaziranga Tiger Reserve

Value + Approach

The study uses a VALUE+ approach wherein the 'VALUE' represents all benefits for which monetary economic valuation is possible and conducted, while the '+' represents all those benefits for which economic valuation is currently not possible either on account of lack of accepted methodologies, knowledge and/or understanding. The economic values derived in the study are thus conservative. It is important to note that the monetary value derived for the tiger reserve is not the exchange value. It is a conservative estimate.



Investment Multiplier

Based on the flow benefits of ₹9,755.88 million per year, for every rupee spent on management costs in KZTR, flow benefits of ₹ 200 are realized within and outside the tiger reserve.



Valuation Framework

The study has used a multiplicity of frameworks including Total Economic Value; Millennium Ecosystem Assessment; Stock and Flow; and Tangible and Intangible Benefits to communicate the diverse values embedded and emanating from tiger reserves.

Total Economic Value (TEV) Framework	
Type of Value	Value (₹ in million/year)
Direct Use Value	-
Indirect Use Value	6,266
Option Value	3,490

Stock and Flow Benefits Framework	
Type of Value	Value (₹ in million/year)
Flow Benefits	9,760
Stock	22,390

Millennium Ecosystem Assessment (MEA) Framework	
Type of Value	Value (₹ in millions /year)
Provisioning Services	3,490
Regulating Services	6,244
Cultural Services	21

Tangible and Intangible Benefits Framework	
Type of Value	Value (₹ in million/year)
Tangible Benefits	-
Intangible Benefits	9,756

Save the Roar- Call for Action

In an economic age economic measures like GDP, profits and income are indicators of the progress of nations or individuals. Valuation becomes an imperative step to the ecosystem services movement in conservation science and advocacy. The study was a fair attempt to monetize the value of ecosystem services of the tiger reserves. This value can be further used for prioritization of activities and investments at the local, national and global level for the welfare of society as a whole.

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CESM is a centre of excellence established in 2007 at the Indian Institute of Forest Management with a mission to conduct action and policy research for ecosystem services management.

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Download the complete report from <http://goo.gl/ZuQdMC>

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*1 US\$ = ₹ 66.3

