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SOCIO-ECONOMIC DRIVERS OF TURTLE EXPLOITATION IN SATNA DISTRICT

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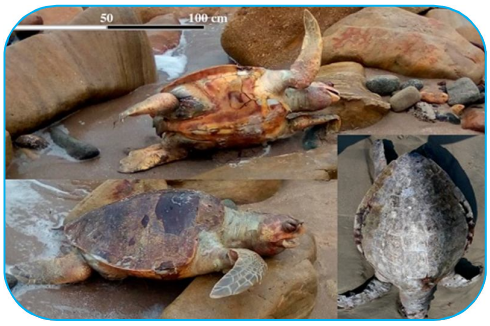
ABSTRACT:



Freshwater turtles are among the most threatened vertebrates globally, with anthropogenic pressures playing a major role in their population decline. In India, socio-economic factors significantly influence the exploitation of turtles, particularly in rural and semi-urban landscapes. The present study examines the socio-economic drivers of turtle exploitation in Satna District, Madhya Pradesh, with an emphasis on livelihood dependence, cultural practices, economic incentives, and awareness of wildlife conservation laws.The study is based on primary data collected through structured questionnaires, semi-structured interviews and focus group discussions with fishing communities, farmers, daily wage laborers and local traders residing near rivers, ponds and wetlands. Secondary data were obtained from government reports, forest department records and existing literature. Socio-economic variables such as income level, education, occupation, family size, dependency on aquatic resources and awareness of legal protection were analyzed using descriptive and inferential statistical methods.

KEYWORDS: *Socio-economic drivers, Turtle exploitation, Freshwater turtles, Community perception, Satna District and Conservation management.*

INTRODUCTION:

Freshwater turtles constitute an integral component of aquatic ecosystems, contributing significantly to ecological stability through nutrient cycling, scavenging activities and regulation of aquatic vegetation and invertebrate populations. Despite their ecological importance, freshwater turtles are among the most threatened groups of vertebrates worldwide, facing rapid population declines due to habitat degradation, overexploitation, pollution and climate-related changes. In India, which harbors a rich diversity of freshwater turtle species, anthropogenic pressures have intensified in recent decades, posing serious challenges to their conservation.

One of the most critical yet often overlooked causes of turtle population decline is direct human exploitation driven by socio-economic factors. In rural landscapes, turtles are frequently harvested for food, traditional medicine, cultural practices and local trade. Such exploitation is rarely a consequence of deliberate biodiversity loss but is instead closely linked to poverty, livelihood insecurity, lack of alternative income sources and limited awareness of wildlife protection laws. Understanding these human dimensions is essential for developing effective, long-term conservation strategies.

Satna District of Madhya Pradesh represents a typical central Indian landscape where human livelihoods are closely intertwined with natural aquatic resources. The district is characterized by an extensive network of rivers, seasonal streams, ponds, reservoirs and wetlands that support diverse freshwater fauna, including several turtle species such as *Lissemys punctata* and *Nilssonia* spp. The majority of the population in the district depends on agriculture, fishing, and daily wage labor, making aquatic ecosystems vital for subsistence and income generation. Increasing population pressure, expansion of agriculture and intensified resource extraction have led to growing human–wildlife interactions, often resulting in the exploitation of turtles. In addition to economic drivers, cultural beliefs and traditional practices play a significant role in shaping human attitudes toward turtles. In some local communities, turtle meat and eggs are believed to possess medicinal or nutritional value, while in others, turtles are used in ritualistic practices. At the same time, awareness regarding the legal protection of turtles under the Wildlife Protection Act, 1972, remains low and enforcement is often weak due to limited institutional capacity and vast areas under jurisdiction.

Most existing studies on turtle conservation in India focus primarily on biological aspects such as population status, habitat loss and reproductive ecology, with comparatively little attention given to the socio-economic forces underlying exploitation. This gap limits the effectiveness of conservation interventions, as biological protection alone cannot succeed without addressing human needs and perceptions. Therefore, the present study aims to examine the socio-economic drivers of turtle exploitation in Satna District, Madhya Pradesh, highlighting the complex interplay between livelihoods, culture, economics and conservation. By integrating social and ecological perspectives, this research seeks to contribute toward the formulation of community-oriented and sustainable conservation strategies for freshwater turtles in central India.

OBJECTIVES:

The present study aims to analyze the socio-economic factors influencing turtle exploitation in Satna District, Madhya Pradesh. The specific objectives are as follows:

1. To identify and assess the major socio-economic drivers responsible for the exploitation of freshwater turtles in Satna District.
2. To examine the relationship between livelihood dependence (fishing, agriculture, daily wage labor) and the incidence of turtle exploitation.
3. To evaluate the role of poverty, income level and seasonal unemployment in influencing turtle harvesting and trade.
4. To study local cultural beliefs, traditional practices and perceptions associated with turtles and their contribution to exploitation.
5. To assess the level of awareness and understanding of wildlife conservation laws, particularly the Wildlife Protection Act, 1972, among local communities.

REVIEW OF LITERATURE:

Freshwater turtles have received growing global conservation attention due to their rapid population declines and high vulnerability to anthropogenic pressures. According to global assessments, turtles are among the most endangered vertebrate groups, primarily due to habitat loss, exploitation, pollution and climate change (Gibbons *et al*., 2000; Rhodin *et al*., 2018). In developing countries, particularly in South and Southeast Asia, human exploitation driven by socio-economic factors has been identified as a major cause of turtle decline.

Several studies highlight that subsistence hunting and local consumption of turtles are closely linked to poverty, food insecurity and lack of alternative protein sources. Moll and Moll (2004) emphasized that rural communities often harvest turtles opportunistically as a readily available and low-cost food resource. Similar observations were reported by Klemens and Thorbjarnarson (1995), who noted that turtle exploitation is frequently associated with marginalized fishing and farming communities.

In the Indian context, freshwater turtles face intense pressure from illegal trade, traditional medicine and religious practices. Vyas (2010) and Das (2015) documented widespread exploitation of turtles across northern and central India, where turtles are used for meat, eggs and alleged medicinal benefits. Studies conducted along the Ganga and Yamuna river systems revealed that despite legal protection, turtles continue to be harvested due to weak enforcement and high local demand (Praschag & Singh, 2012).

Socio-economic studies have increasingly emphasized the role of livelihood dependency on aquatic resources in turtle exploitation. Buhlmann *et al*. (2009) suggested that fishing practices significantly contribute to turtle mortality, either through intentional killing or accidental bycatch. In many rural regions, turtles caught in fishing nets are retained and sold or consumed rather than released, particularly where awareness of conservation laws is low.

Cultural beliefs and traditional knowledge systems also influence human–turtle interactions. Some studies report that turtle meat and eggs are believed to possess medicinal, aphrodisiac, or strength-enhancing properties, which encourages their consumption (Whitaker & Andrews, 2003). Conversely, in certain regions turtles are revered or protected due to religious beliefs, indicating that cultural factors can either promote or inhibit exploitation depending on local context. Lack of awareness and education has been repeatedly identified as a key driver of wildlife exploitation. Sekhar (2003) noted that communities with lower education levels and limited exposure to conservation initiatives often exhibit higher levels of resource extraction. Similarly, Choudhury *et al*. (2014) found that awareness of wildlife laws among rural populations remains inadequate, reducing the deterrent effect of legal protection.

In Madhya Pradesh, studies on wildlife conservation have largely focused on large mammals, with limited attention given to freshwater turtles. Available regional studies indicate increasing pressure on wetlands and riverine ecosystems due to agriculture, sand mining and urban expansion, indirectly affecting turtle populations (Sharma *et al*., 2018). However, district-level socio-economic analyses of turtle exploitation remain scarce, particularly for regions such as Satna.

MATERIALS AND METHODS:

The present study was conducted in selected rural and semi-urban areas of Satna District, Madhya Pradesh, particularly in villages located near rivers, ponds, reservoirs, and seasonal wetlands known to support freshwater turtle populations. A stratified random sampling approach was adopted to select representative villages and respondents from different socio-economic groups, including fishermen, farmers, daily wage laborers and local traders. Primary data were collected through structured questionnaires, semi-structured interviews and focus group discussions (FGDs) to obtain information on livelihood patterns, income levels, education, cultural beliefs, turtle utilization, awareness of wildlife laws and involvement in turtle exploitation or trade. Key informant interviews were also conducted with forest department officials, village elders and local non-governmental organizations to validate community-level information.

Secondary data were gathered from published literature, government reports, forest department records and wildlife conservation documents relevant to freshwater turtles in Madhya Pradesh. The collected socio-economic data were analyzed using descriptive statistics to summarize trends and patterns, while inferential statistical tools such as chi-square tests and correlation analysis were applied to examine relationships between socio-economic variables and turtle exploitation. Qualitative data obtained from interviews and FGDs were analyzed using thematic content analysis to identify recurring themes and underlying drivers of exploitation. The integrated use of quantitative and qualitative methods provided a comprehensive understanding of the socio-economic factors influencing turtle exploitation in Satna District.

RESULTS:

The socio-economic survey revealed that turtle exploitation in Satna District is closely associated with livelihood dependency and economic vulnerability of local communities residing near

aquatic habitats. A majority of respondents involved in fishing and agricultural labor belonged to low-income households with limited alternative employment opportunities, particularly during the non-agricultural season. Accidental capture of turtles during fishing activities was commonly reported and in most cases, captured turtles were either consumed or sold locally rather than released. Statistical analysis indicated a significant relationship between low income, occupational dependence on aquatic resources and the incidence of turtle exploitation. Households with lower education levels showed comparatively higher involvement in turtle utilization, reflecting the influence of limited awareness and economic constraints.

Cultural beliefs and lack of legal awareness emerged as additional important drivers. A substantial proportion of respondents believed that turtle meat and eggs possess nutritional or medicinal value, which encouraged their consumption. Awareness regarding the protected status of freshwater turtles under the Wildlife Protection Act, 1972, was found to be low, particularly among fishing communities. The study also documented the presence of informal local trade networks, where turtles were sold to middlemen at minimal prices, providing short-term economic gains to collectors. Weak enforcement, limited monitoring and absence of community-based conservation initiatives further facilitated exploitation. Overall, the results demonstrate that turtle exploitation in Satna District is primarily driven by socio-economic pressures rather than intentional disregard for conservation, highlighting the need for livelihood-sensitive and community-oriented management interventions.

DISCUSSION:

The findings of the present study clearly indicate that turtle exploitation in Satna District is deeply rooted in socio-economic constraints and livelihood dependence, rather than deliberate violations of conservation ethics. The strong association between low income levels, seasonal unemployment and turtle exploitation supports earlier observations that subsistence needs often drive wildlife use in rural landscapes (Moll & Moll, 2004; Klemens &Thorbjarnarson, 1995). Fishing communities, in particular, exhibited higher involvement in turtle exploitation due to frequent bycatch and limited awareness regarding species protection. Similar patterns have been reported from other parts of India, where incidental capture during fishing frequently translates into intentional utilization because of economic necessity and lack of regulatory knowledge.

Cultural beliefs and traditional practices were found to further reinforce turtle exploitation, especially the perception of turtle meat and eggs as nutritious or medicinal. This aligns with studies by Whitaker and Andrews (2003) and Vyas (2010), which emphasize the role of local beliefs in shaping human–turtle interactions. At the same time, the low level of awareness regarding the Wildlife Protection Act, 1972, and weak enforcement mechanisms reduced the deterrent effect of legal protection. The presence of informal trade networks involving middlemen reflects broader governance gaps and highlights how local exploitation is often connected to larger illegal wildlife trade chains. These findings underscore the importance of integrating community awareness, alternative livelihood options and participatory conservation approaches into turtle management strategies. Addressing socio-economic vulnerabilities alongside ecological protection is essential for achieving sustainable freshwater turtle conservation in Satna District and similar regions of central India.

CONCLUSION:

The present study demonstrates that turtle exploitation in Satna District, Madhya Pradesh, is primarily driven by socio-economic factors such as poverty, livelihood insecurity, low educational levels, cultural beliefs and lack of awareness of wildlife protection laws. Communities residing near aquatic habitats depend heavily on natural resources for subsistence and turtles are often exploited as a readily available source of food or supplementary income, particularly when accidentally captured during fishing activities. The role of informal trade networks and weak enforcement further exacerbates the problem, allowing exploitation to persist despite legal protection.The findings highlight that turtle exploitation is not merely an ecological issue but a complex human-centered challenge that requires integrated solutions. Conservation efforts focusing solely on legal enforcement or biological

protection are unlikely to succeed without addressing underlying socio-economic realities. Therefore, effective freshwater turtle conservation in Satna District must incorporate community-based awareness programs, alternative livelihood opportunities, improved governance and active participation of local stakeholders. By aligning conservation objectives with human welfare, it is possible to reduce exploitation pressures and ensure the long-term survival of freshwater turtles while supporting sustainable development in the region.

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