The Past, Present and Future of Environmental Adaptation in Animals: A Quantitative Investigation

KAMAL KANT JOSHI,
Department of Environmental Science, Graphic Era Hill University,
Dehradun, Uttarakhand, India 248002

Abstract

India has a remarkable variety of flora and fauna, shaped by a range of geographic and climatic conditions. Animals in India have developed over the years and adapted to their surroundings to survive and flourish. Numerous species have adapted to the Indian ecology in unique ways, from the majestic Bengal tiger, which has come to represent India's abundant biodiversity, to the common Indian antelope. To investigate the past, present, and future of animal environmental adaptability in India, the ways that animals have evolved over time to survive in their changing surroundings, and the ways that they now adapt in response to human activities such as deforestation and climate change. Additionally, humans may play in preserving India's unique natural heritage and what efforts might be done to guarantee a sustainable future for both wildlife and people. The Nation may work towards a more harmonious coexistence of humans and the natural world by comprehending the history of animal adoption in India and looking to the future.

Keywords: Climatic conditions, Flora and Fauna, Environmental Adaptability, Conservation, Human Activities.

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Introduction

A wide variety of wildlife may be found in India, and it has evolved over time to cope with different ecological and environmental situations. The wildlife of India is, however, up against a number of obstacles due to climate change and rising human activity. India's wildlife has historically adjusted to a variety of environmental changes, but given how quickly things are changing now, the speed of adaptation must be expedited. Human-animal conflict is a significant obstacle to the conservation of wildlife in India. They suggested that increased urbanization, habitat fragmentation, and rising human activity have caused confrontations between people and animals, which have resulted in deaths of both people and wildlife. This offers a thorough analysis of the human-wildlife conflict's recent history, state today, and potential future developments in India. According to them, creating effective conservation measures that can lessen conflicts between people and animals in India will require a multidisciplinary approach that takes into account ecological, social, and economic variables (Iqbal and Rajora 2016).

The creation of conservation policies including local residents, public institutions, and non-

governmental organizations is crucial for the future of wildlife preservation in India. They suggested that by using a community-based conservation strategy, in which local communities take part in conservation activities. The strategy attempts to deal with the root causes of biodiversity loss and support sustainable livelihoods for neighborhood communities. Additionally, it emphasised the necessity of a multidisciplinary strategy for conservation that takes into consideration ecological, social, and economic factors. India's need for conservation initiatives to safeguard its tigers, co-predators, and prey species. They emphasized the requirement for successful conservation programmes that enlist the assistance of regional communities, governmental bodies, and non-governmental organizations. This showed how crucial protected areas are to the preservation of wildlife in India and implies that the creation of community-based conservation policies is the way of the future for conservation (Jhala et al. 2011).

The significance of comprehending how India's wildlife has adapted to climate change. It was stated that the spread and behavior of many species have already been impacted by climate change, which is one of the largest threats to biodiversity worldwide. The Himalayan area of India is particularly susceptible to the effects of climate change, which has already caused changes in the distribution and migration patterns of some species, including the snow leopard and Tibetan antelope. They suggested that the adaptation tactics used by wildlife in response to climate change could aid in the development of conservation measures that could lessen the detrimental effects of climate change on biodiversity (Bhatt and Singh 2010).

Literature Review

Kalle and Ramesh (2018) focuses on how climate change would affect Indian fauna. They offer a thorough analysis of the effects of climate change on many kinds of fauna in India, such as birds, mammals, reptiles, and amphibians. This emphasizes the detrimental effects of climate change on Indian fauna, including alterations in distribution, phenology, and behavior. To lessen the effects of climate change on Indian biodiversity, they argued that immediate intervention is required. The effect of climate change on wildlife in India is examined by Kumar and Rawat (2013). The distribution, phenology, behavior, and physiology of wildlife in India are all changing as a result of climate change, it was noticed. The need for proactive management techniques to lessen the effects of climate change on India's wildlife was made clear by this. In order to establish efficient management techniques, they contend that a multidisciplinary approach is required, involving cooperation between scientists, decision-makers, and local populations.

Climate change's effects on India's biodiversity, according to Mohapatra and Panda (2017) they emphasized the detrimental effects of climate change on several wildlife species in India, including alterations in distribution, migration, breeding, and death. Additionally, they emphasize how India's wildlife is affected by catastrophic weather phenomena including floods, droughts, and storms. They emphasize the need for quick action to lessen the effects of climate change on wildlife in India, including the creation of climate-resilient habitats and the application of adaptive management techniques. In Kerala, India, Nair (2008) value of traditional ecological knowledge (TEK) in biodiversity preservation. The function of TEK in the preservation of medicinal plants, it was discovered that TEK can be a useful tool in encouraging conservation and sustainable use of natural resources. This demonstrates the significance of integrating local knowledge systems into conservation efforts and implies that conservation programmes should be created in a way that respects and takes into account the perspectives of local communities.

The success of conservation efforts and the capacity of animal species to adapt to the changing environment will determine how animals in India will adapt to their habitat in the future. Pethiyagoda (2012) gives a thorough overview of the development and present situation of conservation biology in Asia. It addressed the difficulties faced by conservation biology, such as the quickening speed of economic growth and the ensuing degradation of natural habitats, and it emphasises the necessity for increased cooperation between conservationists and decision-makers. It also covers the introduction of fresh conservation concepts and approaches, like community-based conservation and ecotourism, and makes the case that these ideas can serve as effective substitutes for more established conservation measures

Shanker (2010) focuses on the effects of climate change on reptiles in India, highlights the necessity for adaptable management measures to protect these species in the future. It was stated that the distribution and abundance of reptile species in India will likely be significantly impacted by climate change, with these effects being especially noticeable in tropical and subtropical areas. It offers a thorough overview of the potential effects of climate change on reptiles, including adjustments to habitat suitability and availability, alterations to the timing of life-cycle events, and adjustments to species relationships. To address how climate change is affecting reptiles in India, appropriate conservation measures must be implemented.

Shukla and Shukla (2014) focuses on how climate change affects India's wildlife and efforts to preserve it. They emphasized the significance of comprehending how species and ecosystems are being affected ecologically by climate change in order to design successful conservation strategies. In order to lessen the detrimental effects of climate change on wildlife in India, collaboration between academics, politicians, and local communities is also stressed by this. For the development of successful conservation policies, it is essential to have a thorough understanding of the biological effects of climate change on India's biodiversity.Singh and Singh (2012) present a thorough analysis of the state of wildlife conservation in India and highlight the reasons that lead to the loss of biodiversity in the nation. They also discuss the conservation issues faced by wildlife in India. This highlighted the necessity of responsible land use practises, efficient wildlife management laws, and community involvement in conservation initiatives. To ensure the long-term survival of India's biodiversity, a comprehensive and integrated strategy to wildlife conservation is required.

Thaker et al. (2016) concentrate on the preservation of large carnivores in India. They present a thorough analysis of the situation of large carnivores in India and highlight the difficulties faced by conservation efforts there. This highlights the necessity of proper management of human-wildlife interaction as well as the significance of protected areas in maintaining large carnivore populations. They also contend that sustainable tourism methods and community-based conservation programmes can operate as financial inducements for the preservation of large carnivores in India. A multidisciplinary strategy including local communities, decision-makers, and conservationists is necessary for the preservation of large carnivores in India.According to Joshi (2018), conservation efforts in India should concentrate on preserving the long-term survival of animal species. The creation of conservation plans that take core causes of environmental degradation—like habitat loss and climate change—into account. To ensure the success of initiatives to conserve wildlife, they emphasize the necessity of cooperation amongst a range of stakeholders, including governmental and non-governmental organizations as well as local communities.

Objectives of the study:

To measurethe past, present and future of environmental adaptation in animals

Research Methodology:

This study is empirical in nature. In this study 190 respondents were contacted to give their viewpoints on the past, present and future of environmental adaptation in animals. The data analysis was done with the help of the frequency distribution and pie charts were used to present the data.

Data Analysis and Interpretation:

Table 1 Environmental adaptation of animals depend upon deforestation

Particulars	Agree	Disagree	Can't Say	Total
Respondents	167	14	9	190
% age	88.0	7.0	5.0	100

Table 1 presents that with the statement **environmental adaptation of animals depend upon deforestation**, it is found that 88.0% of the respondents agree with this statement.

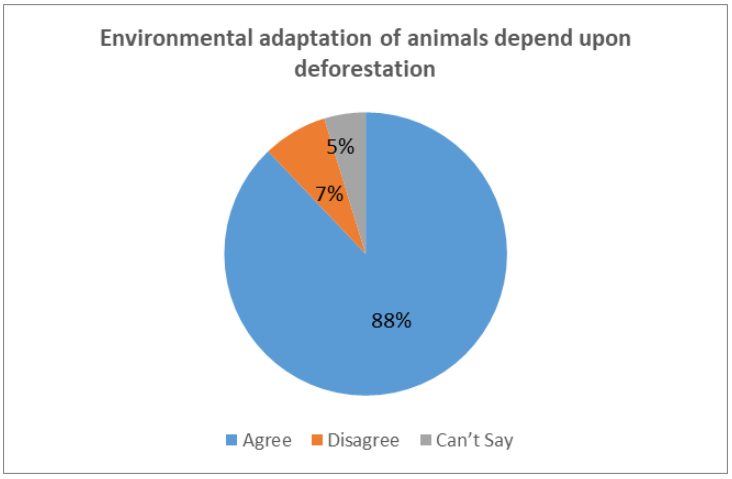

Figure 1Environmental adaptation of animals depend upon deforestation

Table 2 Environmental adaptation of animals depend upon artificial environment

Particulars	Agree	Disagree	Can't Say	Total
Respondents	162	17	11	190
% age	85.0	9.0	6.0	100

Table 2 presents that with the statement **environmental adaptation of animals depend upon artificial environment,** it is found that 85.0% of the respondents agree with this statement.

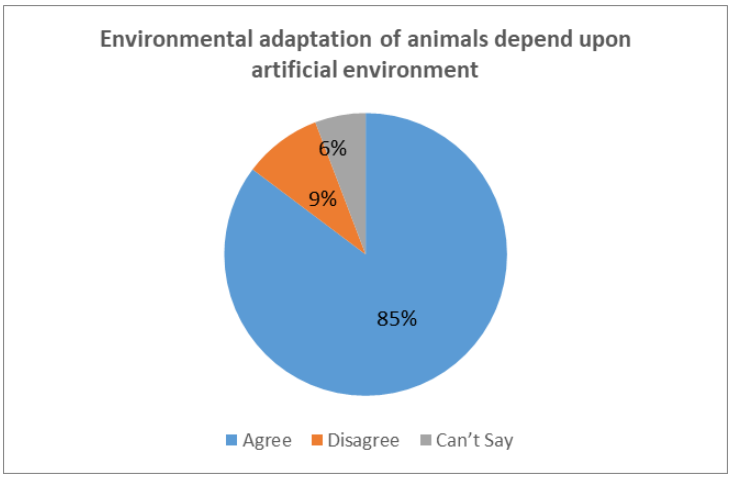

Figure 2 Environmental adaptation of animals depend upon artificial environment

Table 3 Environmental adaptation of animals depend upon technological changes

Particulars	Agree	Disagree	Can't Say	Total
Respondents	173	12	5	190
% age	91.0	6.0	3.0	100

Table 3 presents that with the statement e**nvironmental adaptation of animals depend upon technological changes,** it is found that 91.0% of the respondents agree with this statement.

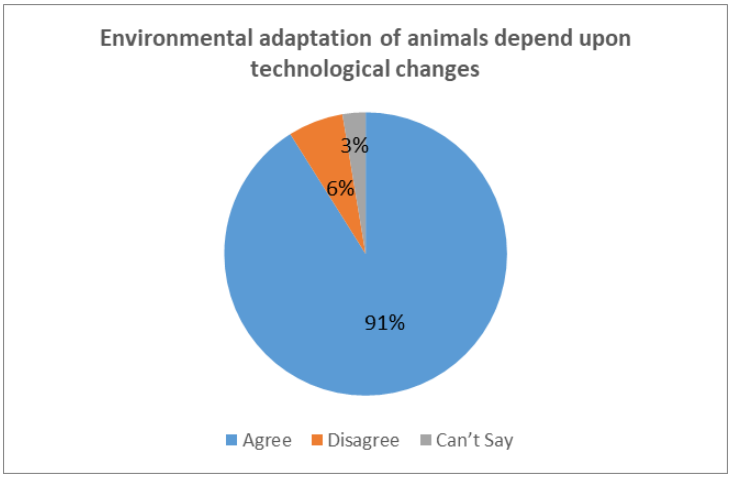

Figure 3 Environmental adaptation of animals depend upon technological changes

Table 4 Environmental adaptation of animals depend upon climate change

Particulars	Agree	Disagree	Can't Say	Total
Respondents	170	13	7	190
% age	89.0	7.0	4.0	100

Table 4 presents that with the **environmental adaptation of animals depend upon climate change,** it is found that 89.0% of the respondents agree with this statement. Considering all the responses of the statements, it was found that to a good percentage, the respondents have agreed which means that above mentioned parameters affect the past, present and future of environmental adaptation in animals.

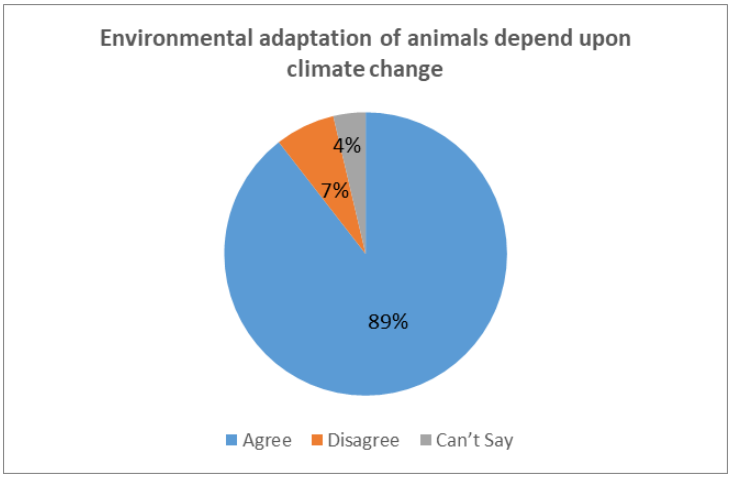

Figure 4 Environmental adaptation of animals depend upon climate change

Conclusion

Animals in India have adapted over the years to the changing environment, which is a country with a vast array of flora and fauna. A tale of resiliency, survival, and optimism is told through the past, present, and future environmental adaption of animals in India.Animals in India have historically adapted to their shifting environment and climatic conditions. One such example is the Indian elephant, which developed a prehensile trunk to help it graze, drink, and breathe in the country's deep forests. Much like other animals, the snow leopard evolved a thick coat to survive in the Himalayan mountains' bitter cold and heavy snowfall. Animals nowadays are faced with new problems like habitat loss, climate change, and conflicts with other wildlife and humans. Poaching and habitat loss have led to the extinction of numerous species, including the Bengal tiger. However, certain species, like the Indian palm squirrel, which can be seen in parks and gardens all over India, have adapted to urbanization and thrive in man-made surroundings.The acts of people will determine how animals in India adapt to their surroundings in the future. For endangered species to survive, conservation initiatives like national parks and wildlife sanctuaries are crucial. To lessen the impact of climate change, it's also critical to cut carbon emissions and stop habitat degradation.The past, present, and projected future of animal adaptation to the environment in India demonstrate how animals have evolved over time to cope with the environment's changing conditions.Others have adapted to urbanisation while certain species confront new difficulties. To secure a healthy future for India's unique wildlife, it is crucial to protect animal habitats in their natural settings and take steps to counteract the consequences of climate change.

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