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# Effect of Changing Climate on Biodiversity Conservation

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**ABSTRACT:** Biological diversity refers to the variety and variability among living organisms and the ecological complexes in which they occur. The loss of biodiversity is important because human existence depends on biological resources and it is the essential component of several ecosystems. The natural resources are over-exploited in many of the tropical islands in spite of fragile ecosystems to meet growing rural poverty and strive for economic growth. All these factors together with climate change are responsible for the extinction or threatened status of a number of species. In many tropical islands, the loss of genetically distinct and unique species is due to human-induced selective pressures. Consequently, there has been a growing realization that the conventional method of conservation is no more effective in dealing with the socio-ecological complexity and political dimensions of biodiversity conservation. By conserving biodiversity, we not only ensure that our surroundings are richer and more diverse but also we secure the resources that will continue to provide improvements in the quality of human life.

**KEYWORDS:** Biological Diversity, Ecological Complexes, Fragile Ecosystem, Socio-Ecological Complexity

## I. INTRODUCTION

Climate change has been linked to well-documented changes in physiology, phenology, species distributions, and in some cases, extinction. Projections of future change point to dramatic shifts in the states of many ecosystems. Accommodating these shifts to effectively conserve biodiversity in the context of uncertain climate regimes represents one of the most difficult challenges conservation planners face. A number of adaptation strategies have been proposed for managing species and ecosystems in a changing climate.

In the last 100 years average global temperature has increased by 0.74°C, rainfall patterns have changed and the frequency of extreme events increased. Change has not been uniform on either a spatial or temporal scale and the range of change, in terms of climate and weather, has also been variable.

Change in climate has consequences on the biophysical environment such as changes in the start and length of the seasons, glacial retreat, a decrease in Arctic sea ice extent, and a rise in sea level. These changes have already had an observable impact on biodiversity at the species level, in terms of phenology, distribution & populations, and ecosystem level in terms of distribution, composition & function.

Many changes have been reported in the distribution of species. In general, many species have expanded their ranges poleward in latitude and upward in elevation. Evidence of contraction in species' distribution is limited, however, possibly due to reporting difficulties and time lag in such contractions due to a wide variety of possible mechanisms such as population dynamics. Populations of many species have declined, and although in some cases climate change is believed to have contributed to the decline, attributing this is fraught with difficulty as it is likely to be only one driver among many. At the species level, changes observed that can be attributed to climate change involve those surrounding phenology (the timing of events). Many birds and insects are showing changes, such as the earlier onset of migration, egg-laying, and breeding. In terms of ecosystems, there has been some evidence of changes in distribution. e.g. desert ecosystems have expanded, and tree lines in mountain systems have changed. Changes in the composition of ecosystems have also been observed (e.g. increased lianas in tropical forests). Such changes may affect ecosystem function and the ecosystem services they provide. Changes in biodiversity and ecosystem services due to climate change are not all negative, with some species either thriving or adapting.

The world is heating up. The increasing concentrations of greenhouse gases, such as $CO_2$, in the Earth's atmosphere are causing the planet's climate system to retain more energy. The average temperature of the Earth's surface increased by

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an estimated 0.7°C since the beginning of the 20th century and, according to the most recent projections of the Intergovernmental Panel on Climate Change, could rise by 1.6–4.3°C compared to the 1850–1900 baseline 2100.

**The effects of increased $CO_2$ in the atmosphere and changing climatic conditions are expected to include:**

- more frequent extreme high maximum temperatures and less frequent extreme low minimum temperatures, and warmer winter conditions
- decreased snow cover: satellite observations suggest that the area of the planet covered by snow has already declined by 10 percent since the 1960s
- increased climate variability, with changes in both the frequency and severity of extreme weather events
- altered distributions of certain infectious diseases
- increased sea levels
- increased ocean acidification

As the climate warms, the geographic location of climatic envelopes will shift significantly, possibly even to the extent that species can no longer survive in their current locations. Such species will need to follow their climatic envelopes by migrating to cooler and moister environments, usually uphill or southwards in the southern hemisphere. Marine species will also need to adapt to warmer ocean temperatures.
In many cases, however, such migration might not be possible because of unfavorable environmental parameters, geographical or human-made barriers, and competition from species already in an area. The mountain pygmy possum is particularly vulnerable to a loss of habitat linked to climate change.

**Climate Change Adaptation:**
Climate-change adaptation is an emerging field that focuses on preparing for, coping with, and responding to the impacts of current and future climate change. More formally, climate adaptation has been defined as "initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects"
Actions undertaken to prepare for anticipated climate-change impacts can be referred to as proactive or anticipatory adaptation, whereas actions in response to climate-related impacts can be referred to as reactive adaptation For example, adaptation strategies in response to increasingly severe drought and forest fires might include such anticipatory actions as prescribed burns or selective forest thinning to reduce the intensity of future fires, while reactive adaptation actions might include broadening the genetic composition of plant materials used in post-fire restoration, with the goal of establishing species or strains better suited to future climatic conditions.

**Direct Climatological Impacts On Biodiversity:**
Climate change poses major new challenges to biodiversity conservation as species will be exposed to changes at a rate and magnitude seldom previously experienced, with direct consequences for ecosystem assemblage and the services they provide to humanity. A broad review of the literature shows that there are many possible ways climate change will impact biodiversity (Kingsford and Watson 2011). These impacts are often divided into discrete acute impacts, principally extreme weather-related events (e.g., storms, droughts, fires, extreme rainfall events), and continuous chronic impacts, such as gradual increases in mean temperatures or decreases in seasonal rainfall, occurring over decades. Both these types of impacts may be expected to interact with prevailing threats in Myanmar with largely unpredictable consequences. Early global analyses estimated that depending on different modeling scenarios, between 1.9 and 40.5 % of endemic plant and vertebrate species in the Indo-Burma Hotspot may become extinct due to climate change over the next century

Climate warming has been shown to impact the reproduction of the critically endangered Chinese Alligator. Indeed, all reptiles exhibiting temperature-dependent sex determination are potentially at risk from global climate change. Furthermore, Skelly et al. (2007) have suggested that lengthy generation times of long-lived reptiles such as turtles will not favor the rapid evolution of thermal tolerance. Although growth rates of ectoderms can increase in response to warmer temperatures, this could prove detrimental if insufficient food is available to meet increased metabolic demands. In seasonal habitats, shorter wet seasons and decreased hydro periods might also reduce the time available for growth among aquatic ectoderms, and consequently, neonates of some species may be unable to reach a body size necessary for survival during their first aestivation

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**Conservation Planning In A Changing Political And Environmental Context**

Following years of political and economic isolation and relatively low conservation expenditures, there is much in Table 2 that remains to be understood about the status of **The Role Of Ecosystem-Based Adaptation** (EBA) and Strong linkages between the impacts and responses of people and biodiversity to climate change indicate the need to develop coherent strategies that seek to conserve biodiversity while maintaining ecosystem services that human communities depend upon. In recent years, EBA has been developed by members of the conservation community as a key approach that uses ecosystem services as part of an overall adaptation strategy to help people to adapt to the adverse effects of climate change. EBA differs from a single species or single sector approach to management by considering complex interactions between humans and the living and non-living environment over multiple scales in space and time. The goal of EBA is to sustainably manage both target and non-target species by preserving or restoring habitat quality to maintain ecosystem services . In particular, it emphasizes the protection and restoration of ecosystem structure, function, and key processes, and integrates biological, socioeconomic, and governance perspectives. We believe that EBA will play an important role in climate change adaptation in Myanmar, especially given the strong human dependence on natural resources such as mangroves and both inland and marine fisheries. It is important to note that EBA is focused on management

## II. CONCLUSION

Climate change is predicted to become a major threat to biodiversity in the 21st century, but accurate predictions and effective solutions have proved difficult to formulate. Alarming predictions have come from a rather narrow methodological base, but a new, integrated science of climate-change biodiversity assessment is emerging, based on multiple sources and approaches. Drawing on evidence from pale ecological observations, recent phenological and microevolutionary responses, experiments, and computational models, we review the insights that different approaches bring to anticipating and managing the biodiversity consequences of climate change, including the extent of species' natural resilience. We introduce a framework that uses information from different sources to identify vulnerability and support the design of conservation responses. Although much of the information reviewed is on species, our framework and conclusions are also applicable to ecosystems, habitats, ecological communities, and genetic diversity, whether terrestrial, marine, or freshwater.

Unique opportunity to conserve biodiversity that is increasingly under threat. While pressures on natural ecosystems are not inconsequential and are likely to be exacerbated in the coming decade, integrating the impacts of climate change on vulnerable species and ecosystems into immediate conservation planning measures will undoubtedly characterize a prudent approach in the long term. A key challenge will be to effectively address knowledge gaps both in terms of biodiversity status as well as climate change impacts in comprehensive conservation planning within a context of rapid environmental changes driven by brisk economic growth and noteworthy socio-political transformations.

## REFERENCES

1.Allen, D.J., S. Molur, and B.A. Daniel. 2010. The status and distribution of freshwater biodiversity in the Eastern Himalayas.
2.http://www.unep.org/pdf/IEA_climate_change.pdf
3.http://www.ipccdata.org/guidelines/TGICA_guidancesdciaa_v2 final.pdf
4.http://www.natureserve.org/prodServices/climatechange/ccvi.jsp
5.Glick, P., B.A. Stein, and N.A. Edelson, editors, 2011. Scanning the Conservation Horizon: A Guide to Climate Change Vulnerability Assessment.
6.Dawson, T. P., Jackson, S. T., House, J. I., Prentice, I. C., & Mace, G. M. (2011). Beyond predictions: Biodiversity conservation in a changing climate.
7.Glick, P., B.A. Stein, and N.A. Edelson, editors, 2011. Scanning the Conservation Horizon: A Guide to Climate Change Vulnerability Assessment. National Wildlife Federation, Washington, D.C.



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