IJFANS INTERNATIONAL JOURNAL OF FOOD AND NUTRITIONAL SCIENCES

ISSN PRINT 2319 1775 Online 2320 7876

*Research paper*  UGC CARE Listed ( Group -I) Journal Volume 11, Iss 6, June 2022

# Ecosystems and Climate Change: Threats, Opportunities and Solutions

Shri Bhagwan, Assistant Professor
Department of Mechanical Engineering, Teerthanker Mahaveer University, Moradabad, Uttar Pradesh, India
Email id- Shribhagwanme@gmail.com

***ABSTRACT:*** ***The health and operation of the ecosystems are inextricably linked to the fast human changing environmental Something we are experiencing in the twenty-first century's early stages. Climate change has an influence on the biosphere owing to variations in global heating rate and variability, as well as many other variables like as increased oceanic acidity and co2 buildup in the climate. Other stresses on ecosystems, such as degradation, defaunation, and fragmented, interact with it. Studying the demographic dynamics affected by these environmental influences, finding regions of sensitivity and resistance, and proposing management approaches that could aid the biosphere's adaptation to temperature warming are all important. At the same time, organisms can help with both climates related adaptation measures. The processes, possibilities, and constraints of such environment global warming solutions must be investigated and assessed. The relationship of climatic changes and the ecosystems is the subject of this study, which presents a topical concern.***

***KEYWORDS:*** ***Carbon, Climate, Ecosystem, Environment, Temperature.***

## 1. INTRODUCTION

Modifications in the environment and seas can have a significant impact on the ecosystem, which is the thin floating film of living things that is inextricably linked to the environment and hydrologic cycle and serves as the sustaining fabric for human cultures. As a result, the degradation or regeneration of parts of the environment is likely to just have global or regional consequences. Anthropogenic

ISSN PRINT 2319 1775 Online 2320 7876
Research paper  UGC CARE Listed ( Group -I) Journal Volume 11, Iss 6, June 2022

pollutants are putting environmental systems' durability and flexibility, and also the modern civilizations which rely on them, in jeopardy, which cause both rising temperatures and rising sea levels(Mohanty et al., 2020). The consequences of these risks may be severe, and in recent years, they have become a more pressing concern, and the report concludes with a summary of the Forum's principal conclusions. As a result, we place a greater emphasis on the research required to better understand the challenges, possibilities, and solutions associated with climate change and environments(Gupta, Jena, & Samantaray, 2019).

*1.1 climate change threats and challenges to ecosystems:*

It concentrated on contemporary exposure issues such as increased environmental volatility and volatility, links among environmental issues and other living thing stressors, boundaries and the risk of quick and teratogenic effects, and multitrophic inter connectivity(Gupta, Jena, Samantaray, et al., 2019). Ecosystems are quickly changing as a result of climate changes and other earth system factors, including precipitation patterns, carbon dioxide in the Among many other aspects, the composition of the environment, hydrological cycle, ecosystem processes, and the incidence and magnitude of extreme occurrences are all being studied. Landscapes range in their reactivity and response to climatic variability due to complicated connections between organisms, disturbances, and other pressures(Jain & Awasthi, 2019).

Important environmental alterations threaten worldwide diversity and have implications for the worldwide food supply. The items in this part help comprehend how climate science impacts environmental features in a variety of environmental settings neighbourhoods (earth based plants, echinoderms, terrestrial soil microorganisms)(El Bilali et al., 2020).

The author relates climatic unpredictability and fluctuations to the prospect for abrupt and permanent changes in ecosystems in the first study in this part. Acute changes in ecological systems (ACES) are difficult to track scientifically since they are unexpected and rarely foreseen. Nonetheless, the authors recommend that researchers focus their efforts on recognizing, comprehending, and projecting ACES

ISSN PRINT 2319 1775 Online 2320 7876
Research paper  UGC CARE Listed ( Group -I) Journal Volume 11, Iss 6, June 2022

as a consequence of global warming(Valentová & Bostik, 2021). Rather than just another "regular way of life," we're beginning to see increasing alterations in the intensity and regularity of numerous factors and passengers over period (equilibrium). The study reveals major generalisations that result in new inquiries and investigation options in the ahead(Malhi et al., 2020).

Many aspects of ecological ecosystems are still more susceptible to rapid transitions than any others; for example, exceptional climatic conditions may be more likely than normal tendencies to cause enormous changeover. ACES is typically produced by the interaction of numerous factors(Mathioudakis et al., 2020).

The author integrates present knowledge of The characteristics of ground plant diversification that makes it adaptable, robust, or vulnerable to climate variability are investigated in conjunction with environmental changes and evolutionary predecessors. In the nitrogen cycle, microbiological populations in the ground perform a significant role(Zhong & Huang, 2019). Daily existence approach and microbiological food. Fast energy channels (such as bacteria in the soil) recycle nutrients fast and bounce back quickly from disturbances, while slow energy channels (such as fungus) cycle nutrients slowly (Fitzmaurice, 2021). Climatic alterations and biological ancestors are used to explore the aspects of ground parts development that make it adaptive, resilient, or sensitive to climatic unpredictability. Microbial contamination communities in the soil play an important part in the denitrification process(Keen, 2021).

While the authors acknowledge that the responses of terrestrial plant species to high levels of distress is fairly well understood, they also point out that the reaction to climate events and the prospect of abrupt natural climate changes are major knowledge shortages that must be investigated scientifically(Seddon et al., 2021).

*1.2 opportunities to improve resilience to climate change:*

The conference focused on advancing scholarly understanding of ways to assist and regulate populations to increase environmental and/or social resiliency and adaptive capacity and oceanic temperatures, incorporating new protection and protection techniques.

ISSN PRINT 2319 1775 Online 2320 7876
Research paper  UGC CARE Listed ( Group -I) Journal Volume 11, Iss 6, June 2022

First, the author offers a fresh perspective on diversification protection in a way that human activity has fundamentally altered the ecosystem(Borras et al., 2020). Fundamental biochemical systems that are unaffected by human activity provide a foundation for comprehending how ecosystems respond to global change, in which humans quickly remove, add, and shift species, communities, and genes. These biological and ecological dynamics continue to function in a world that has been affected by humans, with unique ecological communities made up of species, populations, and genotypes that are well suited to the altered environment(Giddens, 2015; Gobler, 2020). In the Anthropocene, he makes the startling argument that promoting, rather than rejecting, the introduction of new organisms and genes that give advantages is a justifiable conservation approach. He calls for a stronger focus on connectedness, which allows creatures and genetics to reach places where they may survive despite the obstacles of a fast changing environment(Cobbinah et al., 2019; Koubi, 2019; Monroe et al., 2019).

*1.3 solutions and practical applications:*

The potential and problems relate to physical agroecosystems, the topic of our final portion is repair and maintenance in order to enable successful climatic climate mitigation and response efforts. The capacity to maintain, repair, and exploit organisms as mechanisms to resist environmental issues has acquired great appeal there under larger concept of The goal of NbS, or 'naturally weather options' , is to avert impacts of global warming. If ‘maladaptive' NbS, such as non-native repetitious plantings, are avoided, NbS may help to reduce and manage climate change while also potentially preserving rainforests(Aryal et al., 2020).

Ecosystems' potential to facilitate human adaptability changes as a result of climate change. The goal of the author's paper was to put the idea that people and environment "co-produce" those services into practice. They employ a novel approach in which they examine the co-benefits, concessions, and interactions across diverse adapting systems as they go to an environmental cascading that encompasses biological administration, mobilization, appropriation, human availability, and adoption(Box et al., 2019).

ISSN PRINT 2319 1775 Online 2320 7876
Research paper  UGC CARE Listed ( Group -I) Journal Volume 11, Iss 6, June 2022

They use five research examples from set of available alternatives contexts to demonstrate how broader methods may increase co-benefits and decrease trade-offs between adaptive capabilities(Griffith & Gobler, 2020; Wang et al., 2019).

*1.4 Possibilities to enhance environmental and society resilience:*

Ecosystems have an important role in the planet's climate, particularly via their contributions to the carbon, water, and other ecosystem processes. Ecosystems may be a key cause of personal resilience and promote the adaptability of human societies to fast environmental change if they are maintained in a way that is based on scientifically sound environmental and biological understanding. To look at it differently perspective, organisms are mostly not vulnerable to climatic disruption, but they really have the potential to be effective allies in the fight of it disaster risk reduction issues(Poloczanska et al., 2016).

## 2. DISCUSSION

The author has discussed about the Climate change is already underway, and society and organisms will either be dedicated to a much warmer world or will have taken significant steps to reduce warming over the next several decades. In each of these cases, ecosystems play a significant role. Ecosystem connectivity, biological and species variability, trophic intactness, and habitat variability may all help to mitigate the effects of climate change. NbS, such as agroecosystems and restoration, may help with climate change mitigation and socioeconomic adaptation, but they'll only work if they're used in tandem with a decrease in fossil fuel consumption.

## 3. CONCLUSION

The author has concluded about the ecosystems and Climate change: threats, opportunities and solutions. Global anthropogenic greenhouses gas quantities are anticipated to stabilize and average temps will peak at some stage this decade, as human civilization meets the de-carbonization issue. Ecosystem conservation and restoration might have played a key part in that stability, and thus could continue to be an important in the following cooling. Climate change that has already happened will undoubtedly result in ecosystem deterioration and biodiversity loss.

ISSN PRINT 2319 1775 Online 2320 7876
*Research paper*  UGC CARE Listed ( Group -I) Journal Volume 11, Iss 6, June 2022

Communities that appear to be strong, big, and connected have a significantly higher possibility of reacting and prospering in this atmospheric security model, and therefore of contributing to the colourful and productive biotic that is necessary in a future where NbS has now been deployed at level both in and of itself and for supplying the garment within which modern communities exist and thrive. Future changes are expected to include a warmer atmosphere etc.

**REFERENCES**

Aryal, J. P., Sapkota, T. B., Khurana, R., Khatri-Chhetri, A., Rahut, D. B., & Jat, M. L. (2020). Climate change and agriculture in South Asia: adaptation options in smallholder production systems. *Environment, Development and Sustainability*. https://doi.org/10.1007/s10668-019-00414-4

Borras, S. M., Franco, J. C., & Nam, Z. (2020). Climate change and land: Insights from Myanmar. *World Development*. https://doi.org/10.1016/j.worlddev.2019.104864

Box, J. E., Colgan, W. T., Christensen, T. R., Schmidt, N. M., Lund, M., Parmentier, F. J. W., Brown, R., Bhatt, U. S., Euskirchen, E. S., Romanovsky, V. E., Walsh, J. E., Overland, J. E., Wang, M., Corell, R. W., Meier, W. N., Wouters, B., Mernild, S., Mård, J., Pawlak, J., & Olsen, M. S. (2019). Key indicators of Arctic climate change: 1971-2017. In *Environmental Research Letters*. https://doi.org/10.1088/1748-9326/aafc1b

Cobbinah, P. B., Asibey, M. O., Opoku-Gyamfi, M., & Peprah, C. (2019). Urban planning and climate change in Ghana. *Journal of Urban Management*. https://doi.org/10.1016/j.jum.2019.02.002

El Bilali, H., Bassole, I. H. N., Dambo, L., & Berjan, S. (2020). Climate change and food security. *Agriculture and Forestry*. https://doi.org/10.17707/AgricultForest.66.3.16

Fitzmaurice, M. (2021). Biodiversity and climate change. In *International Community Law Review*. https://doi.org/10.1163/18719732-12341473

Giddens, A. (2015). The politics of climate change. *Policy and Politics*.

ISSN PRINT 2319 1775 Online 2320 7876
Research paper  UGC CARE Listed ( Group -I) Journal Volume 11, Iss 6, June 2022

https://doi.org/10.1332/030557315X14290856538163

Gobler, C. J. (2020). Climate Change and Harmful Algal Blooms: Insights and perspective. *Harmful Algae*. https://doi.org/10.1016/j.hal.2019.101731

Griffith, A. W., & Gobler, C. J. (2020). Harmful algal blooms: A climate change co-stressor in marine and freshwater ecosystems. In *Harmful Algae*. https://doi.org/10.1016/j.hal.2019.03.008

Gupta, D. K., Jena, D., & Samantaray, A. K. (2019). Human resource development climate (HRDC) and career planning - A challenge for public sector banks (India). *Espacios*.

Gupta, D. K., Jena, D., Samantaray, A. K., & Das, S. (2019). HRD climate in selected public sector banks in India. *Espacios*.

Jain, N., & Awasthi, Y. (2019). WSN-AI based Cloud computing architectures for energy efficient climate smart agriculture with big data analysis. *International Journal of Advanced Trends in Computer Science and Engineering*. https://doi.org/10.30534/ijatcse/2019/1581.22019

Keen, S. (2021). The appallingly bad neoclassical economics of climate change. *Globalizations*. https://doi.org/10.1080/14747731.2020.1807856

Koubi, V. (2019). Climate change and conflict. In *Annual Review of Political Science*. https://doi.org/10.1146/annurev-polisci-050317-070830

Malhi, Y., Franklin, J., Seddon, N., Solan, M., Turner, M. G., Field, C. B., & Knowlton, N. (2020). Climate change and ecosystems: Threats, opportunities and solutions. In *Philosophical Transactions of the Royal Society B: Biological Sciences*. https://doi.org/10.1098/rstb.2019.0104

Mathioudakis, D. G., Mathioudakis, A. G., & Mathioudakis, G. A. (2020). Climate change and human health. *Archives of Hellenic Medicine*. https://doi.org/10.37547/tajmspr/volume02issue10-10

Mohanty, U. C., Bhaskaran, P. K., Mohapatra, M., & Sahu, S. C. (2020). Guest editorial to the special issue of natural hazards: climate change and coastal

ISSN PRINT 2319 1775 Online 2320 7876

*Research paper*  UGC CARE Listed ( Group -I) Journal Volume 11, Iss 6, June 2022

vulnerability. In *Natural Hazards*. https://doi.org/10.1007/s11069-020-04065-x

Monroe, M. C., Plate, R. R., Oxarart, A., Bowers, A., & Chaves, W. A. (2019). Identifying effective climate change education strategies: a systematic review of the research. *Environmental Education Research*. https://doi.org/10.1080/13504622.2017.1360842

Poloczanska, E. S., Burrows, M. T., Brown, C. J., Molinos, J. G., Halpern, B. S., Hoegh-Guldberg, O., Kappel, C. V., Moore, P. J., Richardson, A. J., Schoeman, D. S., & Sydeman, W. J. (2016). Responses of marine organisms to climate change across oceans. In *Frontiers in Marine Science*. https://doi.org/10.3389/fmars.2016.00062

Seddon, N., Smith, A., Smith, P., Key, I., Chausson, A., Girardin, C., House, J., Srivastava, S., & Turner, B. (2021). Getting the message right on nature-based solutions to climate change. *Global Change Biology*. https://doi.org/10.1111/gcb.15513

Valentová, A., & Bostik, V. (2021). Climate change and human health. In *Military Medical Science Letters (Vojenske Zdravotnicke Listy)*. https://doi.org/10.31482/mmsl.2021.010

Wang, S., Hurlstone, M. J., Leviston, Z., Walker, I., & Lawrence, C. (2019). Climate change from a distance: An analysis of construal level and psychological distance from climate change. *Frontiers in Psychology*. https://doi.org/10.3389/fpsyg.2019.00230

Zhong, S., & Huang, C. (2019). Climate change and human health: Risks and responses. *Kexue Tongbao/Chinese Science Bulletin*. https://doi.org/10.1360/N972018-00898