Effect of Global Warming on Animal Habitat: A focus on India and the global scales

By

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Abstract

Global warming has always had a clear upward trend on its effect on animal habitat disruption, which is mostly caused by the rapid transformation of the climate in ecosystems. This study intends to give a thorough analysis of the environmental issues caused by global warming and its adverse effects on animal habitats. The principal causes of global warming have been discussed, with particular reference to developing countries like India. The multiple hazardous effects of this ecological issue on the animal kingdom and its habitat have been discussed in detail. Besides, the various economic and environmental policies initiated and implemented by the governing bodies of these countries to combat climate change have also been included in the scope of the study. For conducting the research study, secondary data have been gathered from various authentic sources like books, articles, newspaper reports, journals, and websites. For undertaking the study, the deductive approach of research has been employed since it helps to develop a connection between the previous theories and the present reality of the surrounding research issue. Owing to the choice of using qualitative data for the study, the deductive approach has proved to be the most suitable. It has been found in the study that the phenomenon of global warming has led to a significant disruption of the overall ecological balance of the world and the main reasons behind global warming are air pollution and deforestation. Developing countries like India, where there is enormous population pressure, have been hard hit by the ill-effects of global warming as the country has an additional determinant to global warming that is water pollution. Particular attention has been given to the losses and difficulties of the animal kingdom. Finally, this paper will offer you some steps that governments can implement to mitigate the severe ecological challenges to improve the quality of animal habitats.

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Chapter 1: Introduction

1.1 Research Background

Beyond habitat disruption, climate change has always been negatively criticized for its influence on animal livelihood (Surasinghe, Thilina, 2011). Subsequently, global warming is attributed to be responsible for the surge in the extreme weather conditions that cause heatwaves, forest fires, coastal floods, droughts, natural disasters, etc., which leads to habitat disruption in places where animals thrive (Lacetera, 2019). Due to the rising levels of global warming, millions of rare animal species face extinction. On the other hand, global warming is one of the booming results of the increment of greenhouse gas emissions. Concerning the above, countries have come up with clear framed regulations, policies, and acts that are aimed at the protection of the environment and endangered species from hazards and environmental risks (Babinszky, Halas & Verstegen, 2011). Following Al-Amin & Alam, (2011), It can be noted that changes that arise from global warming not only endanger animal habitats, but they also create economic stability in nations. A report from the World Bank (2016) stated that climate change is considered as one of the leading aspects which are causing increasing poverty levels among most emerging countries. Additionally, frequent small changes in temperatures that are caused by global warming are enough to disrupt animal reproduction health, natural vegetation, water availability, and livestock diseases on animals that are already struggling. Importantly, the enhancement of human populations is considered as one of the vital causes of environmental change. Scholars such as Kompas, Pham & Che, point out that in the next years, the survival of animal habitats will highly depend on the proper implementation of regulations, laws, policy and on the creation of awareness programs that are aimed at addressing this social environmental issue (Kompas, Pham & Che, 2018).

1.2 Problem Statement

The problem of the current dissertation is to determine the cause and effect of climate change on animal habitat, especially in India, considering other developing economies as well. Without identifying the root cause, it is impossible for the government to properly amend policies for avoiding the consequences of climate change on animal survival. In this case, the study emphasizes the adopted policies by the Indian government to protect animals, plants, and citizens from the devastating impact of climate change. Along with these, the research paper emphasizes the economic impact of climate change on developing economies like India.

1.3 Rationale of the Paper

1.3.1 The Main Issue of the Study

Environmental change directly influences the biodiversity of nature. Due to the immense and frequent climate change, animal sanctuaries become endangered thus their survival becomes highly dependent on their ability to change and adapt to the new environments. As a result, developing countries face numerous challenges in dealing with climate change because of the lack of robust environmental policies. Hence, it is the main research issue of the dissertation (Kompas, Pham & Che, 2018).

1.3.2 Severity of the Issue

Frequent climate change leads to a devastating impact on animal health, which is responsible for breaking the biodiversity. The economic performance of developing countries has also declined because of the drastic climate change. Developing countries have a lack of policies on the protection of the environment and economy (Rojas-Downing et al., 2017). Hence, it can be asserted that the set research issue is still present in environmental research work.

1.3.3 Focus of the Research

The current dissertation emphasizes finding the root causes of climate change and its impact on animal lives and biodiversity in the Indian context. Additionally, the research paper also will identify the adopted policies for addressing the adverse impact on the environment due to immense climatic changes.

1.4 Aim and Objectives

The core aim of the research study is to critically analyze The long-term effects of climate change resulting from global warming on the survival of animals and its economic impact on India and other developing countries. Based on the above, this study clearly states the following objectives:

- To determine the causes of global warming in India and developing countries
- To minutely scrutinize the hazardous effect of global warming on animal habitat in India
- To identify the economic and environmental policies that are applied by the Indian government to protect animals from climate change and global warming.

1.5 Research Questions

For systematically executing the research purpose, the research work has formed three precise questions, which are:

- What are the causes of global warming especially in India, also considering the other developing countries?
- What is the hazardous effect of global warming on the survival of animals on the earth?
- What are the economic and environmental policies that are applied by India in protecting animals from climate change?

1.6 Significance of the Study

In this field of research, there are multiple numbers of studies, which are aiming at finding the impact of climate change on animal lives (Root, T., Price, J., Hall, K. et al. 2003). However, the focus of the current research is not only on the hazardous effects of global warming on animal health but also on the developing countries' economy. Here, India is selected as a developing country. Along with this, the study also will reveal the utilized economic and environmental policies of India to protecting animal lives from climate change due to global warming. Therefore, it can be argued that the research work has a unique purpose for creating a place in environmental science research.

1.7 Research Structure

Brief information is given about each Chapter of the dissertation through the following table.

Name of the Chapter	**Concise Description**
Introduction	The paper's purpose, objectives, and information regarding the main research area are clearly stated in this respective section of the dissertation.
Literature Review	Influencing past published research works, a chapter will be presented on the most significant theories in the research domain and a clear conceptual framework for helping readers to understand the paper's background.
Research Methodology	This segment states information about the adopted research method. Here, the second approach is the most powerful method

	that can identify the effect of climate change on animal bodies and the economic environment of countries.
Analysis and Discussion	By doing statistical analysis, the paper thoroughly analysis and interpretation of data. Then, develop a relationship between the results of the study and previous research articles, which allows the work to properly justify the research aims and objectives.
Conclusion and Recommendations	Summarized information of every chapter followed with recommendations on the study and research areas where further research is required on the issue.

Chapter 2: Literature Review

2.1 Overview

Climate change has been regarded as the primary driver of exerting the overwhelming and negative impact on livestock welfare and health which is the long-term effect of global warming. Numerous studies have confirmed that the frequent elevation of temperature can risk animal health leading to the death of animals around the globe (Haile, 2020). This Chapter has reviewed several literary standpoints to understand the probable causes of the frequent change in the climate and its overall impact on the survival of the animals as well as on the economic state of the developing nations. Moreover, literary sources have also helped in assessing the environmental and economic policies implemented by the developing countries to preserve natural resources and protect animals from the adverse impact of climate change.

2.2 Reasons behind Global Warming and Climate Change around the Globe Referencing to the Developing Countries

Barber, (2017), has stated that climate change has emerged as a potential threat to the animals around the globe threatening the survival of the animals and is the result of increasing global warming. Another serious cause of global warming is the drastic depletion of the ozone layer that generally happens because of the presence of the gases containing chlorine in the atmosphere. Moreover, aerosols are also responsible for causing global warming leading to a change in climatic conditions. Dong (2020), has identified that by scattering, absorbing the infrared and solar radiation while altering the chemical and microphysical properties, these aerosols affect the extent and life of the clouds.

Moreover, these threats eventually lead to the unavoidable deterioration of the economy mostly for developing countries like India. A majority of the environmentalists and economists are expressing their overwhelming concerns about the impact of climate change.

However, according to Hawken (2017), climate change is caused primarily due to the increasing global warming throughout the world. The elevations of the greenhouse gases, including methane, carbon dioxide, bromine, nitrous oxide, and chlorine contain various compounds leading to radioactive equilibrium in the environment. The most widely acclaimed interpretation of the causes behind climate change is the earth's radiation. Sun rays or energy which is heating the earth’s surface, are considered to drive temperature levels high and cause changes in the planet's climatic or weather conditions. In retaliation, it is said that the earth also radiates back its energy within the atmosphere. Bongaarts & O'Neill, (2018), have found that greenhouse gases play a negative role in this process trapping some amount of the outgoing energy that results in the earth's retention of more heat beyond its capabilities. Once this greenhouse effect is checked, the earth can balance its temperature. The emission of greenhouse gases is considered to have risen since the inception of the industrial revolution in the early 18th century reaching its summit in the last decade. According to the viewpoints of Diffenbaugh & Burke, (2019), a change in the amount of the energy of the sun is a primary candidate causing climatic variability.

Moreover, solar output has played a substantial role in shaping the climate of the earth and is assumed to continue for the upcoming days as well. Besides, change in the orbit of the planet and its rotation are proved to impact the way of the distribution of the sun's energy to the earth. This change in the earth's orbit and its course are confirmed to affect the seasons and latitude of the planet. This phenomenon impacts the generally cyclic changes. When compared with the climate records, the astronomical calculations depict that this particular mechanism is responsible for inducing the climate change from the ancient ice age on a timescale of about 1 million years. Medhaug et al., (2017), has identified that explosive eruptions of the volcanoes are responsible for injecting a large amount of dust into the atmosphere, and the debris from the volcanoes in the atmosphere rains or falls out polluting the air on a large scale. However,

most of the significant eruptions are traced back long ago, and therefore; the consequence has been slight. According to Zhong, (2016), the most prevalent causes of global warming are variations in the sun's intensity, industrial activities emitting carbon dioxide in the air, indiscriminate agricultural activities, deforestation, etc. The increasing emission of carbon dioxide and some other greenhouse gases eventually increases the temperature leading to high global warming. In the USA, fossil fuel burning for making electricity is the most dominant driver of global warming that produces more than 2 billion tons of CO2 each year. Along with this, the transportation sector leads to pollution generating more than 1.5 billion tons of CO2 in a year.

2.3 The Adverse Impact of Global Warming on the Survival of the Animals

According to Brambilla et al., (2018), in the earth, everything is interconnected. Therefore, if anything changes suddenly, everything else is altered. Like human beings, the earth's flora and fauna also require specific conditions for surviving and being productive. The Intergovernmental Panel on Climate Change has declared that the Polar Regions are the most affected by global warming and change in the climate. Mammals like whales and dolphins inhabit the earth's diverse areas. Drastic climate change as a result of global warming is altering the mammalian responses throughout the earth. Schmitz et al., (2018), has found that innumerable small animals are getting out of their hibernations and reproducing earlier than usual.

Moreover, the other animals are expanding their habitat range to the higher altitude of the earth. The reproduction of polar bears has declined drastically for the melting of ice in the Arctic regions. Global warming is affecting the habitats of seals, polar bears, caribou, migratory birds, and reindeer and is changing their lives along with an adverse impact on the entire ecosystem. In the viewpoints of Prakash & Srivastava, (2019), polar bears depend entirely on the sea ice for hunting seals and roaming from one place to the other. Therefore, the melting of

ice during summer is leading to a dramatic and negative impact on the lives of polar bears. The absence of adequate ice in summer is turning the polar bears and seals to adapt to the changing climate as they reproduce, nurse, and take rest on the ice.

In the perception of Keeley, Beier & Gagnon, (2016), the population of reindeer and caribou are also declining as they depend on the tundra regions for vegetation. Global warming and the changing climate have moved northward, and these species are finding more difficulties in searching for food and bringing up their calves.

Ortega, Mencía & Pérez-Mellado (2016), has observed that invertebrates represent more than 90% of the entire animal species. Although the invertebrates are small in size, their role in the environment is enormous. Ants, bees, moths, and other invertebrates play an integral role in the transformation of the pollen that is substantially important for the growth and production of various vegetables and fruits. Due to global warming, the budworms are seen reproducing further north in Alaska. Moreover, the invertebrates, including disease organisms and pests, are seen to shift towards the northern hemisphere and to higher elevations as well. According to Halofsky et al. (2018), global warming has altered the distribution range of all species of animals. Birds are also affected by the drastic increment in global warming. Birds play a pivotal role in dispersing seeds and pollinating. From the standpoints of Alroy, (2017), a majority of environmentalists have found that birds are reproducing earlier while the migratory species are seen altering their habitats.

Along with global warming, the trees are shifting northward as a consequence, the nesting of the birds is also sharply decreasing. Moreover, Wiens, (2016), has stated that, with the rising sea level, the tundra regions and the habitat of various birds are disappearing. This way, the breeding of the birds are also being affected, resulting in less population of birds in these regions. Global warming is adversely impacting the entire ecological process that is

integral to a balanced ecosystem. Dispersion of seeds, pollination, and pest control depends entirely on the birds and their arrival time, factors related to climate and temperature that are regarded as the drastic consequences of global warming. In the words of Rossati, (2017), the rising sea level across the world is harming the habitat of the migratory birds.

Along with the other animals, Nagelkerken, Doney & Munday, (2019), has found that the species of fish are also suffering negatively due to increased global warming. Different species of fish are less abundant throughout the world. Moreover, the other aquatic resources are also being affected by the rising water temperature, increased lake levels, change in seasonal flow, and quality of water. As a result, the entire aquatic ecosystem is being affected by global warming along with the adverse impact on the diversity of species, productivity, and distribution of the species around the globe. Sorte, (2019), has observed that many fish species are decreasing in terms of their survival rate due to higher temperature in winter. Management in marine life has also become more complicated due to the dramatic change in the climate. Global warming is impacting the marine population leading to environmental degradation. The marine environmentalists observe that the increased temperature in the water is harming some of the sensitive species of fishes like the South American perjury that can lead to the production of more than 95% of males.

Bradley et al., (2019), states that a country like India is full of a diverse array of animal habitat. The abundance and diversity of the wildlife resources are paramount for the Indian culture, and this can be at a stake if not checked immediately and adequately. Wildlife and animal habitat depend entirely on the right temperature, food sources, freshwater, and places to reproduce and nurse their young. Global warming and change in climate alter the elements of habitat for the animals and also impact the survival of the animals jeopardizing the natural resources. Bennett, (2017), has found that the rise in ocean temperature will cause a decline in several aquatic species that need cold water for survival. Coral bleaching has been collapsing

the ecosystem as a consequence of increased temperature. Moreover, global warming is also a matter of apprehension for it will be reducing water level, increase erosion level, and degrade the animals living in the water. Besides, global warming is also altering the availability of food for the migratory animal species making them hatch or bloom too early than usual. Thus, the escalation in the rise of global warming has led innumerable species to extinction and danger of extinction. In this regard, the most vulnerable species have been the non –migratory animals that are incapable of moving to a different region. Pikas and the checkerspot butterflies are susceptible to extinction as they are not able to change their habitat due to various reasons.

2.4 The Impact of Global Warming on the Economic State of the Developing Countries

According to the words of Orlov et al. (2020), climate change and global warming have been regarded as the most critical risk for society and the economy as per the World Economic Forum in 2020. For the developing country, this scenario is more vulnerable. Various financial reports across the world show how global warming has negatively shaped the global economy. Global growth is witnessed to be hindered unfavorably by the increment in the operational cost and the rise in global temperature. The economy of the developing countries, including India, are being damaged disproportionately. Aye & Edoja (2017) have stated that the overall impact of global warming will affect economic growth in developing countries' in the long run. The rising temperature will be impacting the economic, political, and financial integration of the global economy. Global warming will become more likely to damage infrastructure, property, mass migration, lost productivity, and security threats influencing primary economic growth. In the words of Osaghae (2016), the rise in the sea level can also impact economic growth in the developing countries as the business becomes impaired while people are more likely to suffer damaging their homes. Although the monetary responsibility for recovering such financial loss will turn positive or GDP at the initial level, the global economy will confront uttermost challenges if such events are occurring permanently.

Peter (2018) has opined that the developing countries will be more prone to witness economic deterioration. For these countries, the replacement of the capital stock measures for preventing further damage is not a sustainable option. Moreover, permanent damage in the output and capital loss will be seen as an unavoidable consequence of global warming.

King & Harrington (2018) has interpreted the loss using a production operation, arguing that global warming will likely influence the economic output in the developing countries. Assuming that there is less availability of the capital stock due to loss inflicted from global warming, a definite fall in the worldwide economy's productivity will be seen. In this context, a downward shift to the developing countries' economic state will be witnessed as the labor units are supposed to produce lesser economic output. Masson-Delmotte et al. (2018) argue that rising temperature can also negatively impact food security, impairing human who works outdoors and promoting the spread of contagious diseases. These factors are responsible for leading towards social unrest while reducing productivity and labor availability to produce the required economic output.

Chen et al. (2016) has also argued that the impact of global warming can also be witnessed appearing as a supply shock through the framework of supply and demand. Global warming is assumed to contract supply at a determined price and can lead to a backward shift of the demand and supply curve. A lower level of economic output will be demonstrated in this case, also leading to inflation. The most endangered sector in developing countries is to be the agricultural sector regarding global warming. Developing countries like India are dependent on farming practices to a large extent. Akinyele & Rayudu (2016) observed that agricultural practices are sensitive significantly to the fluctuation of weather conditions. With the transformation of climate from bearable to the extreme, agriculture is seen as being more unguarded. Frequent droughts in the developing countries minimize crop yield in the vital areas with higher food productivity. Inflation in food prices can be seen squeezing the income of the

customers. This way, the other regions will emerge as more suitable for producing crops rising in competitiveness and more risk of inflation. Huang, Chen & Anandarajah (2017) stated that a high energy cost can also drive inflation. As the climate turns more extreme due to global warming, people will demand more energy to adapt to the changing weather. In this regard, the energy supply may shrink. However, the shift to renewable energy can limit inflation partially.

Furthermore, from the standpoints of Diffenbaugh & Burke (2019), it can be elaborated that the rising frequency, as well as the severity of the absolute weather change, will be more likely to weigh the governmental estimation of the budget. The long-term aftermath of natural disasters compels the governments to spend substantial cleaning-up operations and healthcare compensations. Moreover, the countries that depend mainly on tourism and hospitality can experience a downfall in the revenues. In this context, Huang, Chen & Anandarajah (2017) have argued that global warming can be regarded as the mother of all externalities, temporary or permanent, as well as unpredicted in nature resulting in economic deterioration for the developing countries. A failure to manage the impact of global warming is seen in the developing countries where the poor people are more prone to suffer due to their dependency on the susceptible economic sectors of the developing countries. The following graph shows the impact of global warming on the economy of the globe.

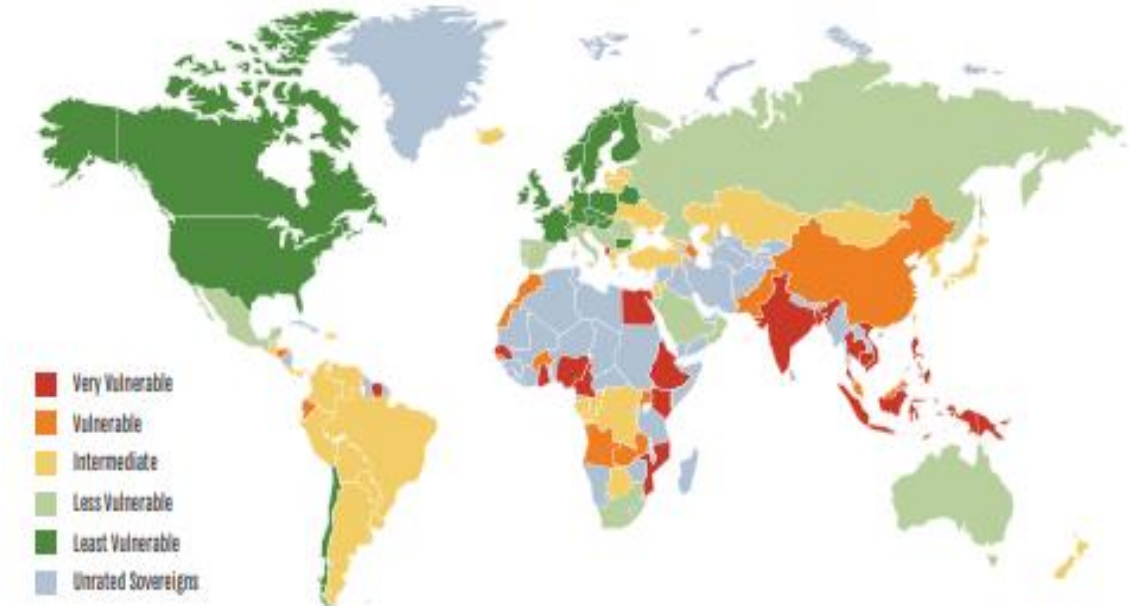


Figure.1: Countries According to the Vulnerability of Global Warming

(Source: Miller et al., 2018)

2.5 Environmental Policies Implemented by the Developing Countries to Protect the Animals

In the perception of Qureshi, Qureshi & Shah (2017), the governments of the developing countries are striving hard to mitigate the adverse impact of global warming on the animal habitat. Most of the developing countries are implementing new and effective policies collaborating with international agreements, environmental laws, and national strategies. However, developing countries like India fail to implement effective policies due to communication, political and economic factors.

Keong (2016) argues that the developing countries have started complying with various international policies that deal both with animal preservation and animal welfare. These countries are now introducing measures based on the market, including emission trading systems, subsidy reforms, and carbon taxes. These policies are also being combined with technological diffusion and development including the adoption of energy sources containing less carbon emission. According to Miller et al. (2018), several mitigation policies in the long-term are being introduced for strengthening the collaboration with the developed countries and

for avoiding drastic inferences with the environment. The developed countries have concentrated on the incorporation of climate policies, including policies for diversification and energy efficiency. Reformation of subsidies has also been made by the governments of the developing countries for reducing emissions of greenhouse gases from agriculture, energy, and transport. The countries are also complying with the policies created by the Export Credit Agencies to assess and report the implications regarding greenhouse gas emissions. Johnson, Karanth &Weinthal (2018) have found that India and other developing countries are incorporating adaptation strategies to minimize the risk of global warming and facilitate the living of the animals that are susceptible to climate change.

Albers et al. (2020), has argued that the developing countries are putting effort to abide by all the environmental policies to reduce the impact of global warming. The countries have aligned with the World Wildlife Fund for protecting the animal habitat from the untimely impact of global warming and climate change. India has also started addressing environmental issues and preserving animal habits from the horrendous impact of global warming. For this purpose, this country has introduced several effective policies such as the National Environmental Policy to create as well as to maintain a balanced environment. This policy is attempting to address issues like poverty that are the unavoidable cause and effect of global warming and environmental degradation. Zhang & Zhang (2017) identified that integrating the environment with economic stability could be traced back to the late 19the century when India conceived the 4th Five-year plan comprised of policies to address the environmental problems. The 1981 Act also empowered policies to mitigate air pollution. The Biological Diversity Act of 2002 helped to protect the animal habitat in India, whereas the Indian Forest Act assisted in preserving the forest and minimizing deforestation.

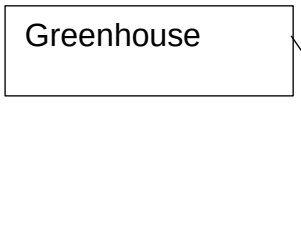
In the viewpoints of Blumm (2017), Article 48A in the Indian constitution has declared for protecting and improving the environment while safeguarding the forest and wildlife of

India. Article 51A (g) has focused on the fundamental duties of the citizens for protecting and enhancing the natural environment such as rivers, lakes, and wildlife and having compassion for all the living creatures. India's nodal agency that is in charge of protecting the environment is the Union Ministry of Environment and the Ministry of Forests and Climate Change. These agencies deal with the wildlife and forests in India.

Badola et al. (2018) has found out that the United Nations Conference, widely known as the Stockholm, is regarded as the initial step to protect the environment in India. This conference announced 26 principles for the country's adoption and compliance for framing the environmental policies. The country has incorporated the decision of this conference to celebrate World Environment Day on 5th June.

However, Badola et al. (2018) has investigated that most of the developing countries, including India are now complying with the policies implemented by the Convention on International Trade in Endangered Species of animals. This agreement was held between the governments of the countries aiming to ensure that no global trade should harm animal survival. The Indian government has shown astounding strictness to control the business in the areas with diverse wildlife. Moreover, the government is also taking stern measures in destroying the unwanted products that are being confiscated from the smugglers and poachers with minute supervision. Diaz-Sarachaga et al. (2016) has also elaborated on the significance of the Montreal Protocol in addressing global warming. This protocol found the depletion of the ozone layer as a consequence of indiscriminate industrial processes and associating with the Vienna Convention, India signed the treaty to address the environmental degradation caused by global warming.

2.6 Conceptual Framework



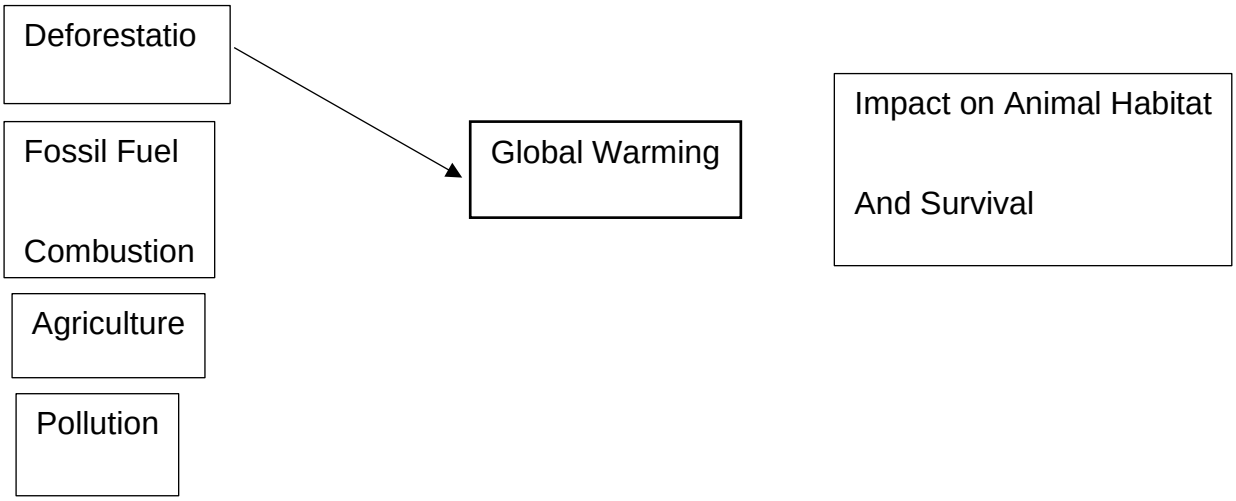


Figure.2: Conceptual Framework

(Source: Created by Author)

2.7 Literature Gap

This research contains some of the areas that went unexplored. While delving into the impact of global warming on animal habitats' survival, this research has focused only on developing countries like India. A comparative analysis with the developed countries would have enhanced the findings transforming this study into an extensive one. Moreover, while reviewing the literature, this paper has focused on global warming on animal habit, excluding human beings. Global warming has a horrific effect on the lives of human beings, too, which went unexposed in this paper, leaving prospects for further research as well.

2.8 Summary

This Chapter has tried to dig into the perceptions of the environmentalists regarding the cause and impact of global warming on the animal habitat in India and other developing economies of the world. Global warming is the most concerning issue in today's globalized world and has a wretched impact on both the livestock and economic state of the countries. India is a country of diverse animal habitat face many problems due to global warming and climate change. Climate change has a huge impact on natural resources which are one of the

mediums of animal food cycle and directly lead to the danger of extinction of few animal species such as Bengal Tigers, Asiatic Lion, Snow Leopard, etc. Global warming in India is not only impacting animal habitat but also has a major impact on the agriculture sector as the extreme climate change leads to irregular rainfall patterns which affect crop production resulting in inflation in food prices. However, India and most of the other developing countries are endeavoring to implement effective policies and complying with international principles to mitigate the effect of global warming on the country's flora and fauna. This Chapter has criticized the viewpoints of the environmentalists to conclude this paper accurately.

Chapter 3: Research Methodology

3.1 Overview

The research methods Chapter is the most integral portion of the research. This chapter elaborates on all the essential steps that have been implemented to carry out the research systematically. This Chapter provides an in-depth insight into the philosophical techniques, research strategy, and approach, collecting and analyzing data, ethical aspects, and research limitations.

3.2 Research Philosophy

Research philosophy determines the nature, development, and source of knowledge and is generally the way of belief through which the data is collected based on the research phenomenon. Among various research paradigms like interpretivism, positivism, realism, and pragmatism, interpretivism is considered the most suitable for pursuing secondary research (Cazeaux, 2017). This paper has tried to penetrate the impact and incorporated policies to fight global warming of environmental changes relying on secondary data sources. Therefore, interpretivism has proliferated the qualitative method of analyzing the existing texts on ecological science. With the application of interpretivism philosophy, the standpoints of various environmental scientists are observed accurately to reach the most appropriate conclusion for this research. This research has been benefitted from the use of this specific paradigm for its naturalistic approach to collecting data (Edson, Henning &Sankaran, 2016). This philosophical approach has simplified the interpretation of the scholars to transform them into coherent findings.

3.3 Research Approach

The research approach is usually the determining plan or procedure consisting of the steps to be followed for the assumptions. This facilitates data collection methods, analysis of

data, and interpretation of the same. The research approach is based accordingly on the nature of the research and is of three categories, such as abductive, deductive, and inductive approach (Alase, 2017). However, for this present study, the deductive approach has been considered as this paper entirely based on secondary data. Through the utilization of the deductive approach, the study has focused on the previous research papers on environmental science for justifying the impact and implemented policies for fighting global warming. Based on the specific requirements of this research's aims and objectives, the deductive approach has aided the entire investigation.

Moreover, this approach has also helped to develop a connection between the previous theories and the present reality of the surrounding research issue (Woiceshyn & Daellenbach, 2018). However, the deductive approach has been adopted for research as it helped to preserve both time and money. Moreover, the deductive approach combines accurately with the secondary data, while the inductive approach is more likely to integrate with the primary data. Hence, the reason for implementing this approach is justified.

3.4 Research Design

Designing thorough research is the most crucial part of determining the research issue. Research design helps implement steps to conduct the study based on the research objectives (Dannels, 2018). The most widely adopted research designs are explanatory, conclusive, and exploratory design. The conclusive design is also categorized as casual and descriptive research designs. However, the exploratory design has been adopted here, for it is the most advantageous in conducting qualitative research. To understand the cause and effect of global warming on the animals and the economy and for investigating the implemented policies to combat environmental changes, the exploratory design was considered the most accurate for this study. This design has simplified the research questions probing into the depth of the research issue.

Moreover, this design has facilitated the entire research methods with a particular focus on the data collection technique. The primary justification behind adopting this design is that exploratory design is possessed with adaptability and flexibility regarding the change, determining the groundwork to facilitate further studies and preserving time and the other essential sources (Jain & Tiwari, 2020). As this study has focused on the qualitative method, this design's utilization has simplified the entire comprehension of this study. Thus, the adoption of an exploratory research design is justified in this paper. However, the explanatory design is avoided for it better integrates with the quantitative analysis.

3.5 Research Strategy

The selection of the research strategy is possibly the most pivotal task for a researcher. It helps in pursuing the research systematically and in a synchronized manner. It also makes the entire research project coherent and comprehensive. The most widely used research strategies are qualitative and quantitative strategies of research (Idowu, 2016). Qualitative strategy can be based on both primary and secondary data, whereas quantitative strategy is based entirely on the primary sources. However, based on the research requirements, some of the studies can also devise both research strategies. To understand the causes of global warming and its impact on the globe and identify the existing policies to address the same, a qualitative strategy has been adopted in this particular study. The qualitative approach has facilitated the interpretation of the texts relevant to this study. Moreover, this strategy has assisted in gaining extensive knowledge of the research issue while generating new concepts and ideas to meet the objectives accordingly (Abdalla et al., 2018). However, the quantitative strategy has been avoided due to the inadequate resources allocated for this project.

3.6 Data Collection Method

The stage of collecting data commences after determining the research problem and chalking out the research design. The collected data from relevant sources should be genuinely

describing the observations and facts surrounding the research issue (Paradis et al., 2016). As mentioned above, this paper has relied entirely on the qualitative strategy considering the secondary sources of data, which include mainly two types of animals that is herd animals and hunted animals. Herd animals are the animals who live and travel in groups for protection purposes like Goats, Ships, llamas, etc. whereas hunted animals are those who are hunted by pack hunters like chimpanzees, dolphins, lions, etc. The quantitative strategy is contradictory to this strategy and depends on the primary data. The primary objective of this research is to identify the policies to address global warming and how it impacts animals. Therefore, secondary data is regarded as the most appropriate source of data for this particular research. Secondary data are referred to as the information that exists in literature and can be extracted for some research purposes. The relevant data has been extracted from various authentic books, articles, newspaper reports, journals, and websites to delve into the changes in the environment during the last few decades (Ellram & Tate, 2016).

Moreover, these scholarly articles have increased knowledge regarding the research objectives. In this research, secondary data has been collected for supporting the research issue that revolves around the impact of global warming and its associated impact on the world. The dataset used in this study is Economic, Mobility, and Environmental dataset (Ullah, Isaac, 2015). The secondary data is considered fruitful for this study as it is accessible quickly and consumes fewer resources.

3.7 Data Analysis Techniques

Analyzing the accumulated data is the most critical task for the researcher as the real effectiveness of the research depends on the correct analysis. However, the techniques of analyzing the secondary data are less time and energy consuming as compared to the primary data (Ruggiano & Perry, 2019). The analysis of secondary data revolves around the selection of the relevant texts and interpret them accordingly to get meaningful findings. In this regard,

the analysis processes of secondary data undergo a few stages to transform the interpretations into comprehensive results. Determining the research questions, locating the data, evaluating the validity, authenticity, and reliability of the data, assessing the relevance of the data, and analyzing them using thematic analysis tools is the systematic way of analyzing secondary data (Johnston, 2017). This paper has undergone all these essential analyzing steps to provide the readers with coherent and accurate results relating to the impact of global warming and the associated policies to deal with the same. Furthermore, after identifying and selecting the variables in this study, I performed descriptive statistics to find the relationship between the variables accurately using the STATA tool. Moreover, various graphs and charts have been used in the analysis part for simplifying the visual representation of this study.

3.8 Research Ethics

It is of paramount significance of adhering to some of the basic ethical aspects while conducting research. All the ethical aspects are handled to make this study an authentic one. As this study is dependent on the secondary sources only, the extent of maintaining ethical aspects is comparatively reduced than the primary sources. While interpreting the secondary sources including books, journals, and websites, and articles, only the recently published documents have been considered. Moreover, to avoid plagiarism, I interpreted all the accumulated information in my own words, without imitating the other scholars' words. I have also cited the reference of those scholars in the dissertation paper with proper credit. Along with these, I ensured to use the gathered data only for the research purpose.

3.9 Research Limitations

This paper has focused on the secondary sources of data to interpret the research problem. Therefore, the research findings have been constrained. The adoption of primary sources would have proliferated the findings to perceive the impact of global warming and the policies to mitigate the impact of the same. Moreover, while conducting the secondary data

collection, some of the sources prevented access to the sites and it led to a delay in delivering the research project on time.

3.10 Summary

Thus, with the proper utilization of all the essential steps of research methodology, this paper has tried to dig into the impact of global warming on animal habitats and implement policies to prevent the same in India as well as other developing countries. For conducting the research study, secondary data have been gathered from various reliable sources like books, articles, newspaper reports, journals, and websites. The philosophy of interpretivism has been chosen because it allows an accurate observation of the standpoints of various environmental scientists for reaching the most appropriate conclusion for research. The naturalistic mode has aided to transform his interpretation into coherent findings. For undertaking the study, the deductive approach of research has been employed since it helps to develop a connection between the previous theories and the present reality of the surrounding research issue. Owing to the choice of using qualitative data for the study, the deductive approach has proved to be the most suitable. The application of exploratory research design has facilitated the entire research work, focusing on the secondary data collection technique using a descriptive statistic for the respective dataset. Moreover, the inclusion of ethical considerations and limitations of the research have transformed this paper into a more authentic study.

Chapter 4: Analysis and Discussion

4.1 Overview

This specific research work aims to critically explain the effect of global warming on animal population and survival. For accomplishing the research goal, this research work primarily gathers information from secondary sources and the nature of the data is qualitative and quantitative. For this reason, I adopted the descriptive statistic tool that is Stata for efficiently interpreting the quantitative data, which is accumulated from different published reports on the environment. Along with this, the study also analyzed the qualitative data descriptively by giving proper evidence. In these two processes of data analysis, this respective research work can efficiently understand the connection between global warming and animal survival. This portion of the research guides us to reduce the pollution level and carbon emission level for addressing the consequences of global warming on the environment. Therefore, by using these methods, the study can efficiently provide proper justification for the research questions.

4.2 Analysis

4.2.1 Identification of Causes of Global Warming

It can be said that the ozone layer depletion is primarily responsible for increasing the temperature of the earth, which is also accountable for the reason for melting glaciers. Due to the high presence of chlorine in the atmosphere, environmental scientists can observe several holes in the ozone layers (Liu et al., 2019). Chlorofluorocarbons are another element that has a direct relation to the depletion of the layer of ozone in the stratosphere. Apart from this, it can be asserted that the presence of aerosols in the atmosphere is considered as one of the causes of global warming (Bayeh & Alemayehu, 2019). Considering the given information of eminent scholars, it can be said that global warming is one of the leading causes of climate

change all over the world. On the other hand, for urbanization, most of the companies with having a back-support government cut forests. Deforestation creates a negative impact on animal survival because of limited forests; animals cannot find the right place and natural food sources (Li et al., 2019).

The maximum application of pesticides and fertilizers reduces the fertility power of lands, which is one of the reasons for the death of plants that adversely impact the animal survival purpose. From the functions of power plants, transportation, and business sectors, the level of carbon emission steadily raising, which is a result of the booming cause of global warming (Herndon, 2018). Along with these, oil drilling and natural gas drilling are also influential components that directly impact climate change. Excessive use of plastic creates a negative impact on the environment, which not only raises severe repercussions for wild animals, but also human beings for further survival (Rotman, Weber & Perkins, 2020). Therefore, governments of several developed and developing nations should, along with or align their policies with international agencies, take measures to combat global warming for protecting the natural movements of animals.

4.2.2 Effect of This Drastic Climate Change Due to Global Warming on Animal Habitat

In this study, I have selected three major variables, which are temperature, precipitation, and animal count because these variables play an important role in determining the effect of global warming on the animal population (Zhong, 2016). The selected variables also provide information regarding the changes that happened over time, so that the government can take precautions for saving their animal habitat. By using the descriptive statistic Stata tool, it helps in understanding the significance of the research variables. Here are descriptions of the Statistics terms used in the analysis of variables of the dataset:

1. **Mean:**

It is the average of the dataset and is calculated as the sum of the observations in the dataset divided by the number of dataset observations.

2. **Median:**

   Median refers to the middle value of the dataset numbers.

3. **Mode:**

   Mode simply defines the most common number in the dataset.

4. **Standard Error:**

   Standard error indicates the reliability of the dataset mean explaining whether the mean of the sampled dataset is accurately reflecting the actual population mean or not. Normally the large sample size dataset has a smaller standard error representing that the dataset mean is quite an accurate reflection of the actual population mean. In simple terms, the dataset used in the research is reliable for getting the expected results.

5. **Standard Deviation:**

   Standard Deviation is used to check how spread out the numbers is in a dataset. A low value of this measure represents the numbers inclines to be close to dataset mean whereas a high value says that the numbers are quite spread out over the broader range.

6. **Sample variance:**

   It is a term used to measure to check how diverse a dataset is. A small number shows that data values are closer to the mean and close to each other while the high numbers display that the dataset values are spread from the mean and each other.

7. **Kurtosis:**

   It is used to measure the presence of outliers in the dataset. It has three types by which the interpretation gets easier and these are the followings:

   - Mesokurtic: This type of Kurtosis has the same distribution as the normal distribution of the dataset meaning that the extreme values of the distribution

are similar to that of a normal distribution. Hence, this distribution sets the ideal kurtosis value for a standard normal distribution which is 3.

- Leptokurtic: This Kurtosis type comes with a condition that is when the Kurtosis is greater than 3(the ideal value mentioned above). If this condition is fulfilled, then it means that the dataset is full of outliers.
- Platykurtic: In this case, the Kurtosis should be less than 3 and if this condition is satisfied then it says that the dataset has a lack of outliers.

8. **Skewness:**

   Skewness in the dataset simply implies whether the dataset has symmetrical data distribution or not. It can be positive and negative. When the mean and median are higher than the mode, the skewness is positive while when the mean and median are lower than the mode, the skewness is negative. If the dataset has symmetrical distribution, then it will have 0 skewness.

9. **Range:**

   The range is simply the difference between the highest value and the lowest values in the dataset.

10. **Minimum:**

    Minimum represents the lowest value in the sample dataset.

11. **Maximum:**

    Maximum represents the highest value in the sample dataset.

12. **Count:**

    It is a measure used to know how many numbers observations are there in a dataset

The highly important variables are explained below by using the descriptive tool Stata to provide information on how global warming has disrupted animal habitats.

herd_animals	
Mean	3.360215054
Standard Error	0.173252523
Median	2
Mode	1
Standard Deviation	2.362849392
Sample Variance	5.583057251
Kurtosis	-1.234242231
Skewness	0.615568687
Range	6
Minimum	1
Maximum	7
Sum	625
Count	186

Figure.3: Herd Animals

Based on figure 3, it can be observed that the mean number in each location is near three, which is extremely less because the total count of herd animals is 186 considering every location. The skewness of 0.6 describes that the number of herd animals is neither decrease or increase in relation to the mean of each location whereas the Kurtosis value which is negative 1 describes that there is a high number of outliers available meaning that there are high chances of reduction in the herd animal population. The Standard Error shows that the data is reliable with 95% confidence level.

fish_type	
Mean	2.311827957
Standard Error	0.056517654

Median	2
Mode	2
Standard Deviation	0.770798037
Sample Variance	0.594129613
Kurtosis	0.929106014
Skewness	1.402420049
Range	3
Minimum	1
Maximum	4
Sum	430
Count	186

Figure.4: Fish Type

Considering the above graph, it can be stated that there are at least two different types of fish in every location, whereas in total, 430 types of fishes are present in all locations. The distribution pattern of this variable can be approximated to normal and skewed distribution. After presenting this statistical information, the paper provides clear statistical information on those animals, which can be hunted by human beings.

hunted_animals	
Mean	2.817204301
Standard Error	0.068143682
Median	3
Mode	3
Standard Deviation	0.929355912
Sample Variance	0.863702412
Kurtosis	-0.722742574
Skewness	-0.362421976

Range	3
Minimum	1
Maximum	4
Sum	524
Count	186

Figure.5: Hunted Animals

This graph states that the mean value of hunted animals is around three in any location. Unfortunately, the average number of herd animals is also three, so it is difficult for animals to carry out their reproduction properly. For this reason, it can be said that hunt countries are faced with problems related to the extinction of animals.

Climate change brings hazardous consequences to the animal world. Food starvation is considered one of the major issues for the survival purpose of animals in definite locations. Statistical information on this analysis is given in this paper below:

Die_food_starvation	
Mean	2
Standard Error	0.060030023
Median	2
Mode	2
Standard Deviation	0.818700354
Minimum	1
Maximum	5
Sum	372
Count	186

Figure.6: Death Rate of Animals Due to Food Starvation

Habitat disruption is one of the major consequences of global warming. For responding to severe climate change, animals try to change their lifestyles. The temperature of the world

is drastically changing because of global warming, which creates adverse impacts on the vegetation that leads to problems like the death of animals due to food starvation (Li et al., 2019). The above-pasted graph states that the average rate of animal death caused by food starvation is 2, which is comparatively high in every location. Therefore, it can be said that environmentalists and government of every nation must take immediate and effective steps to protect animals from food starvation after temperature fluctuation and other social issues.

After giving information on various aspects, in this part, I will concentrate on the population density of animals. To identify the population density of animals, I will apply the number of alive animals per area in given forest land. (Rotman, Weber & Perkins, 2020).

pop_density	**total_pop**	
Mean	3.76344086	4.02688172
Standard Error	0.144208287	0.106578937
Median	4	4
Mode	1	3
Standard Deviation	1.966738826	1.453542906
Sample Variance	3.86806161	2.112786981
Kurtosis	-1.179361342	-0.388571824
Skewness	0.037566078	0.43320568
Range	6	7
Minimum	1	1
Maximum	7	8
Sum	700	749
Count	186	186

Figure.7: Information on Total Population and Population Density

The figure gives clear knowledge of the averages of population density and total population, which are 3.8 and 4, respectively. Global warming is responsible for a drastic change in the environment, which negatively impacts animal population density.

Simultaneously, it can be asserted that the impact of global warming has been identified in terms of temperature rise. Heated environment is not favorable for animal survival, such as polar bears, snow leopards, giant pandas, green sea turtles, mountain gorillas, and others alike. By understanding the current temperature fluctuation caused by global warming, the paper provides a clear, descriptive statistic table of the temperature below:

temperature	
Mean	292.3489247
Standard Error	0.669761195
Median	296.15
Mode	300.15
Kurtosis	0.424830594
Skewness	-1.146173314
Range	37
Minimum	265.15
Maximum	302.15
Sum	54376.9
Count	186

Figure.8: Temperature

Figure 8 delivers statistical information on one of the effective research variables of the current dissertation topic. The average temperature is 292 is too high, and it creates an adverse impact on animal survival and may also boost the animal death rate because of deforestation; due to a lack of proper shelter for animals resting in deforested areas. The maximum

temperature is 302, and the minimum temperature is 265. The stated minimum temperature is also high, so it can be observed that animals try to find out the cooler and safer places as they migrate for survival purposes (Greenstone & Hanna, 2014). Therefore, the study successfully argues that temperature change due to global warming initiates a problem for the animal population.

Chapter 5: Effect of Global warming on Indian animal habitat

5.1 Overview

Like all other developing economies, Indian animal habitat is also having problems brought about by change in the climate and global warming. The country is rich in flora and fauna hence they are facing challenges towards the survival of their animal habitat. Climate change is not only affecting the country's biodiversity but also its economic wealth. Over time, the government of India realized the issues and is taking steps towards the conversation of their animal habitat as well as implementing more and more policies to fight the negative effects of global warming.

5.2 India's Biological diversity and climate change

lndia is a country known not only for its geography, history culture but also for its diverse natural ecosystems. India's richness of biodiversity is distributed all over the country including its forest, wetlands, and marine areas. Out of 34 biodiversity hotspots, India has four of them that is the Himalaya, Western Ghats & Sri Lanka, Indo-Burma, and Sundaland- the country anchors 7-8 percent of the world's recorded species. As per the documents, the country has more than 91,200 animals and 45,500 plant species till 2018. The country has 4,900 flowering plant species till 2018 that belong to 47 families and 141 genera which are largely concentrated in the northwest Himalayas, Northeast, Western Ghats, and Andaman & Nicobar Island. India has almost 62 percent of recorded amphibian species that are widespread across the country- representing the country's richness in fauna and the majority of them found in the Western Ghats. India also enjoys variety in fishes with the representation of 57 percent of its total families and 80 percent of global fishes. Of the 783 species of freshwater fishes belonging to 89 genera from 17 families, 223 species are widespread (National Biodiversity Authority, 2018). India has quite a wealth of biological diversity in its forests, wetlands, and its marine

areas. Table 1 displays the richness of the country in absolute numbers of species and the proportion these species represent the world total from 2000.

Group	Number of species in India (SI)	Number of species in the world (SW)	SI/SW (%)
Mammals	350	4629	7.6
Birds	1224	9702	12.6
Reptiles	408	6550	6.2
Amphibians	197	4522	4.4
Fishes	2546	21730	11.7
Flowering Plants	15,000	2,50,000	6.0

Table 1: India's biodiversity comparison to the world total

Source: Chopra, A.(2009)

Below given Figure.9 displays the graph representation of table 1 data to reflect absolute values and their proportion for the available species in India as well as in the world from 2000.

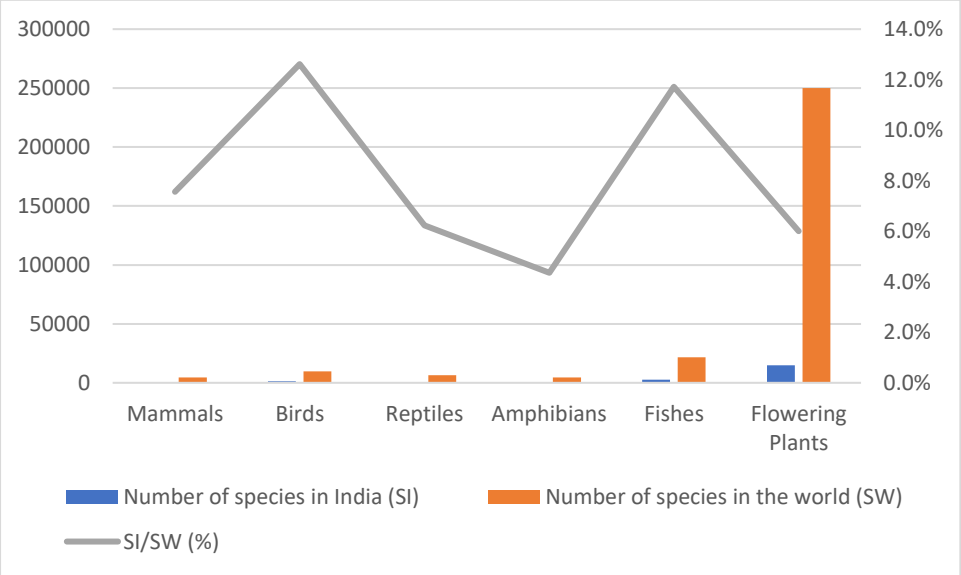


Figure.9: Graph representation of India's biodiversity comparison to the world total

Source: Chopra, A.(2009)

Natural resources like flora and fauna are the basic requirement for every country especially for India with a large population that requires more of their resources but with the extreme

climate change, it is becoming hard every year to fulfill the basic resources due to their reducing numbers. The country's climate is heavily influenced by the existence of the Himalayas in its northern part and the Thar Desert in the western part. The Himalayan Mountains act as a barrier to winds from Central Asia and China, enabling India's climate to be warmer than other countries which are at the same latitudes. Hence, the country's northern part is characterized as a continental climate with hot summers and cold winters. However, the coastal regions of the country experience warmer temperatures with little variations throughout the year and frequent rainfall. Over the period, the average temperature has increased to approximately 0.59 degrees Celsius especially between the period 1901-2007. During this period, the warming trend has accelerated with the strongest warming in winter and post-monsoon seasons. For the winter season, the average temperature has raised by 0.70 degrees Celsius over the past 100 years while the post-monsoon average temperature has increased by 0.52 degrees Celsius.

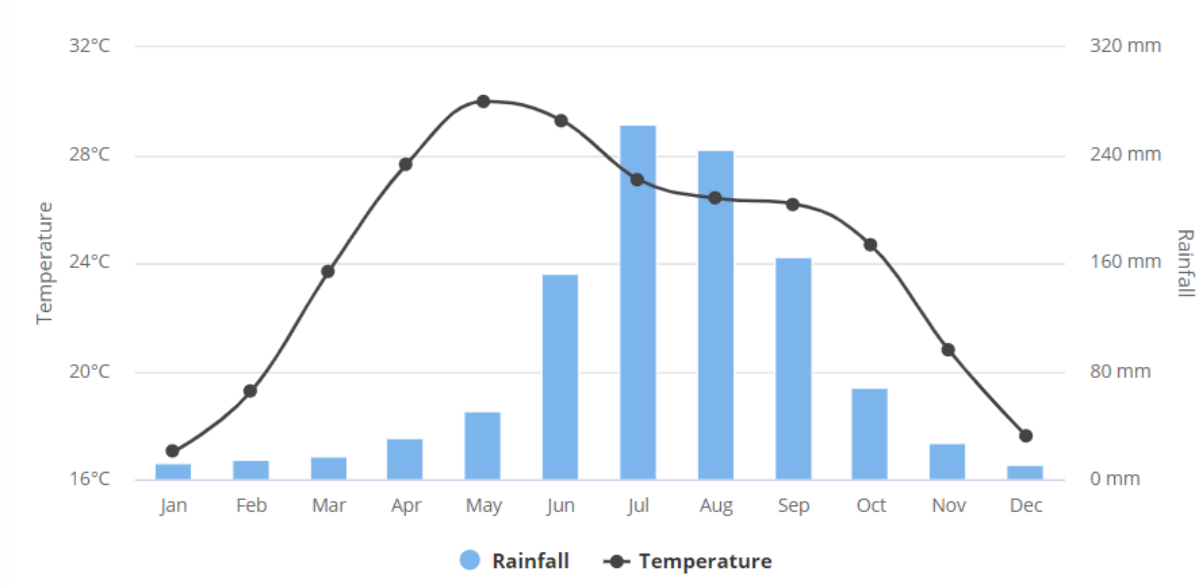


Figure.10: Average Monthly Temperature and Rainfall between 1901-2016

(Source: World Bank Group (2016))

However, in terms of precipitation- the change measured in monsoon over the 1871-2009 time period is weak on the national level with a continued trend towards a slight decrease in

precipitation. Although the frequency of wet days has declined across the country, the majority of the decline has taken place in the central and northern parts of India (World Bank Group,2016).

5.3 Impact of Global warming on Indian animal habitat

As the world is moving towards modernization, more and more urbanization is happening leading India towards the destruction of its natural resources. This destruction has a great impact on the survival of both animals as well as mankind. Some of the major concerns affecting India's climate are, carbon dioxide fertilization of plants, fire frequencies changer over time, etc. This lives animal habitats unsecure throughout the year because they directly affect the life cycles of animals which are highly dependent on Flora and Fauna.

As mentioned earlier, the temperature is increasing and getting warmer with every passing year and this extreme climate change is endangering a few species which only exist in a cold environment. For example, Nilgiri Tahr – found in Southern Western Ghats of India- a study using an ecological Niche model by R.K Sony and team (2018) stated that "the extreme global warming could make an alarming 60 percent of their current suitable habitat unsuitable." Hence, monitoring is required at a greater and regular level of the habitats especially for those who are identified as most at risk. A temperature rises not only harm the animals but also harm the plants and human beings. These warm temperatures led to river runoff sometimes which produce the scarcity of drinking water for animals as well for growing plants nearby that river. Below Figure.11 represents the list of threatened animals by their status category in India as per the red list of threatened animals from the International Union for Conservation of Nature and Natural Resources (IUCN) (2000) (CPREEC, 2000). According to the list data (Figure.11), here are the definitions of terms used for the status category of biodiversity in India.

- Endangered: The species which are in danger of becoming extinct.

- Threatened: The species which will be becoming endangered if the present condition in wild worsens.
- Vulnerable: The species which are experiencing a decline in the number of its population.

Critically Endangered	18
Endangered	54
Vulnerable	143
Lower Risk conservation dependent	10
Lower Risk near threatened	99
Data Deficient	31

Figure.11: Threatened animals by status category in India

(Source: CPREEC (2000))

The given pie chart in Figure.12 will help us to visualize the distribution of the threatened animal species of India by their status category in 2000.

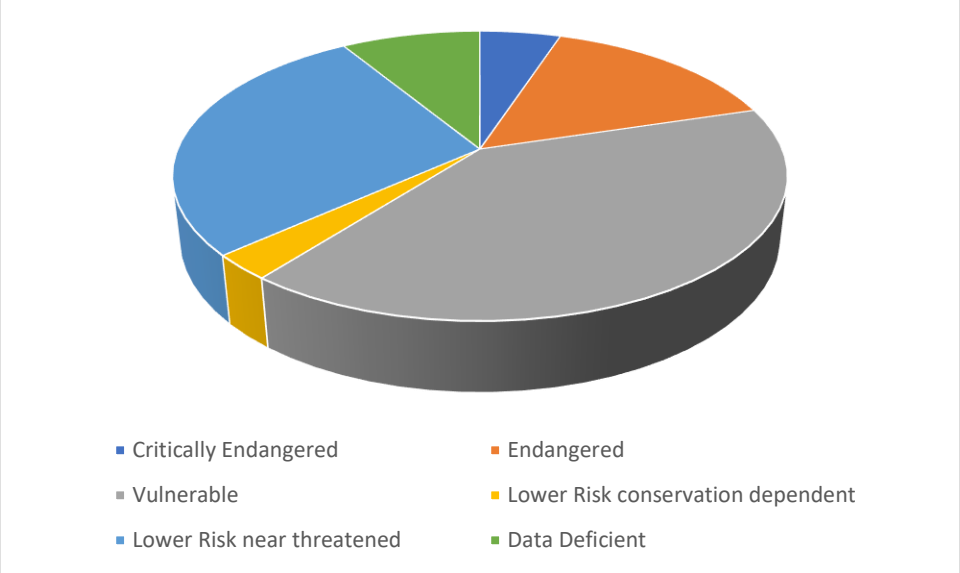


Figure.12: Pie chart representation of threatened animals by status category in India

(Source: CPREEC (2000))

The biggest driver's concern is carbon dioxide which results in changing the climate and weather patterns of the world. This situation led to a continuous fall in the amount of rainfall in the northern plain resulting in draughts. This also affects many wild animals and plant's life cycles who are closely linked to the passing of climate and seasons. The draughts affects the

productivity of the fields or farming sectors and India's major population survive on farming- the draught situation and changing patterns of participation sometimes led to the failure of the farm fields. Not only is global warming and climate change harming the environment of India, but it also affects the economic development as well.

In India, agriculture plays an important role in economic development. In case the farms could not produce the crops due to climatic conditions like a decline in rainfall or drought- this will create scarcity for that particular food product in the market, which might lead to a rise in food prices. Raise of food prices results in inflation, which leads to high rates of unemployment hence the consumer purchasing power reduces, while the bank increases interest rates. This problem is mainly faced by the lower class of the Indian population because as the product and service prices rise, their income remains the same hence they cannot afford basic human necessities. Also rise in temperature or extreme heat directly results in lowering the productivity of outdoor workers. A McKinsey Global Institute report (2020) stated, "In India, nearly 75 percent of the labor force (some 380 million people) is exposed to heat-related stress. By 2030, the average loss in daylight working hours could put between 2.5 and 4.5 percent of the Gross Domestic Product (GDP) at risk annually"

The rise in Inflation also encourages competition in the market resulting into more inflation. Hence, this can result into slow growth in the economy and will force the government into a deficit budget. Inflation always affects every part of the economy, not just one. To keep the economy steady or at a growing pace, the government always has to take care of biodiversity as it affects both humans and animals as well as their economy. The government of India has started various programs to preserve their wildlife and other biological diversity.

5.4 Adopted Policies to Fight against Global Warming and Avoid the Negative Impact of This Social Issue on Animal Health

Not only humans but wild animals also faced new problems due to environmental change. Frequent drought, heatwaves, storms, rising sea levels due to glaciers melting, pollution, deforestation, and global warming are directly impacting the animal habitat daily. Due to these natural calamities, the majority of the animals lose their places for living. From various environmental reports, it can be stated that every country must design some environmental policies for combating deforestation (Kumar, 2009). By implementing advanced environmental policies, the government of India can positively overcome the adverse consequences of climate change. For dealing with the adverse impact of global warming, the Indian government wanted to focus on the formation and implementation of those environmental policies, in which the country can efficiently reduce the carbon or greenhouse gas emission level (Greenstone & Hanna, 2014). On the other hand, water pollution leads to a problem related to ocean acidification, which is harmful to the survival of underwater animals. World Wildlife Fund is an international agency which is aligned with every country's government and local communities to protect social beings from the negative effect of global warming (Nomani, Wani & Tahreem, 2019).

In India, the government has introduced a National Environmental Policy for creating and maintaining a healthy environment. Poor quality of the environment is considered a factor, which is responsible for the health problems affecting the majority of the population in the country. Poverty leads to malnutrition among children and old age people of India. In this policy, the government of India tries to provide safe drinking water, improved sanitization, and other resources to maintain a healthy environment (Dhulia & Ganguly, 2018). In 2002, India came out with the biological diversity act, which helps to protect the biodiversity of the country. Through the Indian Forest Act, the administrative board can protect the forest environment.

This act divides forests into three parts, such as reserved forests, village forests, and protects the forest. Forest offenses are mentioned in this act. Central Pollution Control Board and the State Pollution Control Boards are responsible for looking at the pollution aspect. Water and Air Acts help manage pollutions for avoiding global warming. Along with these, the country is also engaged in the formation of various environmental policies for reducing greenhouse gases emission for controlling global warming (Dubash et al., 2018).

Through the formation of the National Action Plan on efficiently dealing with climate change, India tries to reduce the emissions of greenhouse gases and improve renewable energy capacity. Understanding the bad impact of global warming on wild animals, the Council of Prime Minister has recently taken some effective measures on maintaining peace within the forest and on the management of coastal zones, animal health, and energy (Nomani, Wani & Tahreem, 2019). The Indian government also takes strict action on the usages of plastic bags, which positively affects protecting animals from hazardous situations. Apart from these policies, other policies are taken by central and states governments of India in developing a healthy environment for wild animals to increase their population density.

5.5 Summary

India being a diverse population of flora and fauna has a major concern towards the subject of global warming and climate change. Global warming not only impacts negatively on wildlife but also has a high effect on human life and their life cycles. Risking their biodiversity is like risking their existence especially when the country has quite a large population. Although the Indian government is taking precautions but still, they need to concentrate more on their endangered species and control their pollution level which is one of the major reasons for global warming in India.

Chapter 6: Discussion

6.1 Causes behind the Ecological Problem, i.e., Global Warming

According to the literature section of the study, it can be revealed that holes in ozone layers are considered the path where UV rays pass through on the surface of the earth for increasing the temperature of the earth (Hawken, 2017). From findings, deforestation breaks the biodiversity of the environment, and it is also measured as an element that is responsible for global warming (Bayeh & Alemayehu, 2019). From this elaboration, it can be comprehended that air pollution and deforestation are the most influential causes factors of global warming. Due to this ecological problem, animal and plant worlds are in trouble because animals are unable to find adequate places for protecting them in difficult situations. On the other hand, the literature review section states the presence of pollutant elements in the air is responsible for increasing the acidic nature of the air, and it is the major reason for acid rain. Acid rain increases the toxicity in soil, which also leads to soil error. Animals underwater are also in trouble in leading their lives in toxic water (Bongaarts & O'Neill, 2018). Besides, the finings part of the dissertation claimed that as global warming increases the water level of seas, so underwater plants and animals witness drastic changes in front of their eyes. By using their adaptable nature, animals try to survive in difficult situations, but because of high temperature and deforestation, animals are observing some difficulties in finding food and shelter (Rotman, Weber & Perkins, 2020). Hence, it can be clearly said that global warming brings dramatic changes in the environment that negatively affect the animal habitat. Simultaneously, it can be asserted that from the literature review that greenhouse gas emission from vehicles and corporate sectors is impacting climate change. Change in the temperature due to global warming negatively impact the animal population. After melting glaciers, the temperature of the water is comparatively low than the surface temperature of the earth, which became problems for underwater animals to survive in different temperatures (Greenstone & Hanna,

2014). The analysis segment of the research gives clear information that international agencies support emerging and developed nations for reducing the adverse impact of global warming on animal species. From this discussion, the major influential factors of global warming have been identified.

6.2 Comprehensive Knowledge about the Effects of Global Warming on the Survival of Animal Species

It has been found from the literature review that life on this planet is very much interconnected; that is, any change in one life form induces a range of changes in the larger structure (Brambilla et al., 2018). Therefore, the negative changes in the ecosystem have not left any species from being affected. Going by the work of Schmitz et al. (2018), it is evident that a countless number of hibernating animals are getting out of their slumber and reproducing way ahead of the usual time. This indicates that the natural order has been affected by human activities to such an extent that all other forms of life are facing difficulties in adapting to the rapidly changing climatic conditions. The Intergovernmental Panel on Climate Change has declared that the poles are the most affected regions on the planet. The lives of polar creatures like the polar bear, seals, caribou, etc. have been impacted heavily due to global warming, to such a point that many of these species are under severe threat. As per the comments of Halofsky et al. (2018), global warming has altered the distribution range of all the species of animals, thus causing a significant setback in the functioning of the ecosystem. Each species has a specific habitat where it had evolved gradually. Each species has a role to play in the ecosystem, and as the members of each species go about searching for different habitats, away from their original ones, it is pronounced that many are succumbing to the challenges of the new area. While many are perishing, the ones who are living on are finding it much difficult to reproduce. The nesting birds have lost their habitats owing to deforestation, and they are unable to breed properly, thus steadily moving towards a threatened existence. The findings have

shown that the decrease in the bird population has resulted in a stark increase of certain insects, causing distress to other species. Being primary pollinators, the alterations in the bird population has affected the plants' reproductive cycle massively. Sorte (2019) states that many species of fishes and other aquatic creatures are suffering immensely owing to the rise in sea temperatures in winters. The invaluable insects without which all life on the planet would cease to exist in a matter of a few months are being pushed to change their habitat and move to higher altitudes, where they are unable to survive. In a country like India, which has the maximum biodiversity in the whole world, the abrupt ecological changes brought forth due to the phenomenon of global warming has resulted in a massive crisis. Thus, the study reveals that the way the world is operating right now unless we take the necessary steps, a whole lot of species, which are essential for human survival, will vanish into thin air in a century. Thus, it is imperative to take stringent and responsible action to prevent the chain reaction-like situation that is going on for a long time. Without preserving the biodiversity, there is no way life on earth can go on.

6.3 Economic and Environmental Policies for Maintaining Biodiversity in the Animal World

The findings evince that owing to the drastic and abrupt changes in the environmental conditions caused by irresponsible and unrestrained human activities; the animal kingdom has been subjected to immense torture. To take some preventing measures against the growing ecological concern, the governmental bodies of the world have taken noteworthy action. Kumar (2009) suggests that every country in the world must come together and take major steps on a large scale to bring about immediate changes in the worsening ecological conditions. Nomani, Wani & Tahreem (2019) have been vocal about the contribution of the World Wildlife Fund in the preservation of the climatic conditions, make food available, conserve the forest regions of the world, secure freshwater for people's consumption and nature, and safeguarding the natural

composition of oceans. In India, the introduction of the National Environment Policy changed people's approach towards the ecosystem. It has focused on responsible usage and protection of natural resources for ensuring the survival of a sustainable ecosystem. In 2002, India passed its Biological Diversity Act to preserve the rapidly depleting biodiversity of the country. The National Action Plan has enabled the Indian government to take charge of the GHG to lower the carbon footprint and thus mitigate the growing global warming. In more recent years, the Indian government has been instrumental in implementing stricter steps to reduce the ill-effects of human civilization to preserve whatever forest life that is left. The cleanliness of the forest environment, the banning of plastic bags in protected places, the animal welfare schemes, and the acts like Air (Prevention and Control of Pollution) Act are a few of the steps that the Indian government has taken to reverse the environmental damage that the human beings have caused. The governmental bodies of major industrial cities have initiated their "green city" projects to bring down the level of air pollution and thus reduce the percentage of GHG in the atmosphere. Metropolitan cities like Delhi, where the air is heavily polluted, have suffered the most adverse effects of climate change. The Central Pollution Control Board (CPCB), along with its counterparts, the State Pollution Control Boards (SPCBs), are involved in the implementation of the relevant rules for the prevention and control of environmental pollution (Dubash et al., 2018). The data gathered and analyzed in the study reveals that the world bodies have been active in taking responsible steps to mitigate the effects of global warming and thwart the sources of the problem. Still, it is a fact that while there are laws, people, in the broader context, are not very active yet. Without the involvement of the general masses, ecological changes are complicated to be brought about. The governments should take more decisive steps to enforce the various environmental laws so that a quicker and more significant change can be manifested. While the findings show that the world bodies are actively thinking about global

issues, it is about time that they educate the people further to earn their committed pledge in the war against climate change.

6.4 Summary

This dissertation examines the connection of global warming on animal habitat and survival. The Secondary approach is appropriate in this research study. Both qualitative and quantitative information is accumulated for the development of the paper from reliable authentic sources. By using descriptive statistics, I can analyze the connection of research variables. Additionally, the study also interprets qualitative data by properly utilizing the analytical skills of the research author. After the analysis, the study efficiently states the causes of global warming in India. Deforestation, immense pollution level, heat waves, acid rain, greenhouse gas emissions, and plastic use are the main influential reasons for global warming. Then, the study discusses the impact of this ecological issue on the habitat of wild animals. Global warming increases the temperature of the earth's surface, which is becoming a problem for animals in carrying out their reproductive functions to maintain heredity. Due to deforestation, wild animals cannot find their food, and it increases the death rate of animals due to food starvation. Along with this, animals cannot find proper shelters for surviving the high temperature. The government of the selected emerging nation, i.e. India, has incorporated some environmental policies to set some guidelines for the citizens of India to maintain a healthy environment. Proper usages of regulations and acts to help India to diminish the negative impact of global warming on animal bodies.

Chapter 7: Conclusion and Recommendation

7.1 Conclusion

From the detailed discussions in the preceding Chapters, it is evident that global warming has caused much suffering in the animal world. Such frequent elevation of temperature can risk animal health, which threatens the livelihood of animals around the world. The literature review section has shown that many factors like the loss of vegetation, increase in the number of functioning gasoline and diesel vehicles, irresponsible handling of the natural resources, have impacted the environment so drastically that every country has recognized the weight of the situation and taken some step towards preventing the impending ecological disaster. GHG, aerosol, and chlorine in the atmosphere have resulted in an overall increase in global temperature. The rapid climatic changes have negatively impacted the animal population. Failing to adapt to the changes brought about by human beings due to their irresponsible handling of nature, many animal species have gone extinct. In contrast, many of the remaining others have fallen under the endangered category. The polar regions of the world have experienced significant disruptions in terms of environmental conditions. The sea level is rising each year, thereby threatening the existence of lower lands. In every manner, animals have been found to lose their habitat and many of their lives. The drastic changes in the animal world have proved to be disastrous to the global ecological balance. It has also been found from the study that all the major nations have taken progressive steps to mitigate the hazardous situations springing from global warming and the subsequent climate change. The data analysis has revealed much about the various aspects of the problem. It has been seen that deforestation has played an instrumental role in disturbing the natural order of things, which includes the mean temperature of the planet. The lack of vegetation has increased the concentration of GHG in the atmosphere and also snatched away the shelter of many different species that live in and around the trees. Without the needed trees, there is not enough shade to protect the land and

animals from the severe heat. The disturbance of the order of forest life has resulted in a direct effect on the human world, in the form of distorted climatic conditions and rapid climate change. If this persists, although humans will still manage to live on for some more years, the unprotected animals which are entirely dependent upon the natural order of things will perish. Such a colossal disharmony in the ecosystem will naturally affect the food cycle adversely. Once that happens, the survival of the human race on this planet will not be possible. Thus, it is imperative to alter the course of destruction that has been initiated by human beings alone if the survival of life on this planet is to be ensured. The tree planting projects which the governments across the globe have taken, and most importantly, a steadfast involvement of the masses are the only ways to counter the ecological challenges that lie ahead. If action is not taken right now, the process will go out of hand. Thus, the study has tried to shed some light on the current scenario of the world and suggested some remedial measures which can bring about changes in this acute age of environmental crisis.

7.2 Recommendations

Although the governments of major nations worldwide have taken serious measures to mitigate the rapidly unfolding environmental disaster, considering the nature and scale of the ecological issues, it seems that much stronger steps need to be implemented on a larger scale to create an actual impact on the field. In developing countries like India, where the population pressure is huge, preserving the ecological balance is particularly vital to sustaining the lives and livelihoods of the populace and the survival of the animal population, which is a vital element for maintaining the ecological balance of the planet. The government should take stringent measures to sustain the natural resources that are vital for the survival of the myriad animal species. One solution to almost every environmental issue in the country and the world at large is restoring the green cover, which has been wiped out on the ground of so-called ‘development’ (Gao, 2020). Even economically, developing countries like India cannot

improve the scale and performance of their businesses without taking care of the environmental conditions. The major agro-based industries which account for a large portion of the Indian economy shall fail to survive if the environmental situation is not handled with care. This is so because there is tremendous pressure on the soil which is naturally leading to problems related to water. Without water, life cannot be sustained, and once the water level goes further below, the chances are that the world might get into a mode of "water war." But while it is apparent that water scarcity could be a significant issue in India, the source of the problem is always ignored. The quality of soil is the chief determinant of water-related difficulties, for it is the land that is supposed to hold the water in India, where the only source of water is the monsoon rains. Rivers and lakes are destinations of water, rather than being sources for public use.

Soil quality can be enhanced simply by planting trees across cities, villages, and especially on the banks of the major rivers in the country. Serious action in the direction of crafting "green cities" can reverse the ongoing environmental degeneration in a matter of a few decades. This would also restore the purity of the highly polluted air by reducing the carbon footprint in and around the cities and bring the land under shade. Increased tree cover would provide habit to multiple animal species. Farmers can benefit financially from this scheme if the governments assist the practice of "agro-forestry" in which farmers themselves grow trees on their lands and can later sell it as timber (Dollinger, & Jose, 2018). Introducing an economic dimension in the ecological plans would certainly provide momentum to the whole movement. Thus, a huge tree-planting movement, not necessarily in terms of afforestation, but innovative processes like agroforestry which was talked about by J. Russell Smith in his book Tree Crops: A Permanent Agriculture (1929) can be initiated by the Indian government to make a significant change in the country's ecological status, and thus ensure the future of the humans and animals alike.

7.3 Future Research Scope

Although the research scholar has tried to cover multiple aspects of the chosen subject matter with various authentic sources of secondary data, there is no doubt that the implementation of primary data could further enhance the range and scope of the study. Thus, future scholars can work on this based on the primary method of data collection. Moreover, a holistic understanding of environmental issues like global warming requires sufficient knowledge about the conditions of the vegetation. Future scholars can enrich the study further by talking about the adverse effects of global warming on plant life.

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