

ASSESSMENT ON ECOSYSTEM CONDITIONS – PROGRESS TOWARDS A GLOBAL STANDARD

W.V. Sophia Stella Sargunam

Assistant Professor, Bharath Institute of Law.

sophi22ss@gmail.com

ABSTRACT

The life cycle of individual is highly influenced by environmental factors. The concept ecology is the study of relationship between living beings and surrounded atmosphere. Environment protection is part of our cultural values and traditions. Everyone has right to obtain basic facilities. Whereas, Directive principles under the Indian constitution directed towards ideals of building welfare state. The research aims to study the importance of sustainable development and framework regarding ecological life.

INTRODUCTION

Ecosystem is a condition where every natural being share a common space for living. This includes the interaction within or between abiotic and biotic factors that also provides habitat to plants, animals and other living organisms. Humans are also a part of this ecosystem. As it is well known concept that everyone is dependent on one another, the ecosystem is much important as the world is made up in such a setup that all living creatures need to support each other for the betterment of all. In other words it can be said as the ecosystem plays a vital role in ecological balance, providing basic needs of clean water and air, stable climate conditions, and also it is the natural habitat for diverse species.

On the other hand it is a well-known fact that it is the basic human right to lead a healthy life, in order to lead a healthy life it is necessary that there is a balanced ecosystem. To have a balanced ecosystem, human being also needs to contribute a lot. Though it's a primary duty, the present condition of ecosystem does not show that human beings have contributed much for the betterment but whereas they have degraded the ecosystem at the worst possible way.

Present condition of ecosystem

Due to increasing population, technological development, pollution etc., the environment that exists has undergone various changes. Though ecosystem as to be balanced it is not so at the present times. Since there is in an imbalance in the ecosystem, the ecological cycle has been changed a lot that has led to species and habitat loss. Since there is imbalance in ecosystem it also leads to climatic changes that further have severe impact on environment. There are various other changes that shows that there is an unbalanced ecosystem and they are:

- The seasonal flow of rivers are getting disrupt due to the climatic conditions - the scientists of University of Leeds¹ have found that 21% of river across the globe have

¹ <https://climate.leeds.ac.uk/news/climate-change-disrupts-seasonal-flow-of-rivers/#:~:text=A%20team%20of%20scientists%20led,and%20fall%20in%20water%20levels>.

shown changes rise and flow in its water level during the seasonal times and not been as it used to be earlier.²

- Tropical forest witnessed new temperature – in January 2024³ the researchers of University of Helsinki and the Finnish Metrological Institute submitted a report that was published in The Scientific Journal Natural Publication in which they clearly stated that due to global warming the temperature of tropical forest as seen visible changes and that temperature can be nearly 4% lesser.⁴
- Rise in sea level due to climatic change – in the magazine of scientific reports the University of Bonn submitted a findings in the year 2017⁵ in which they clearly explained that the sea level was raised around the ocean of Antarctica 1500 years back and due to the climatic conditions that takes place now same might repeat.⁶
- Migration of Birds disrupts the magnetic sense in birds – in the study done by University of Oldenburg and the University of Oxford (UK)⁷ it was found that the radio waves and television waves emitted and the mobile communication network frequencies affects the magnetic sense in birds that makes their migration tough. This study was submitted and published in the journal Proceedings of the National Academy of Science (PNAS) in August 2023.
- Variety of Flora and Fauna are endangered - In the findings of Axel Hochkirch of the Musée National d'Histoire Naturelle, Luxembourg, and colleagues which was presented in November 2023 in *PLOS ONE*⁸, the open-access journal they found that around 14,699 species which includes both flora and fauna found in Europe faces the risk of extension.⁹
- Air pollutants are the primary reason for asthma – the children are triggered to asthma due to various new toxic pollutants and their different combination found in air. This study was conducted among the children of living in Spokane, Amiri by Washington State University in march 2024¹⁰ and found that air pollutants in atmosphere has affected the children. The air pollutant that was present was about 25 among which 13 are more toxic.¹¹
- Ability of the soil and Climate change - in the research undertaken by Department of Sciences at Rutgers University - New Brunswick submitted in Journal of Science advances in the year 2019¹² September it was found that due to various climatic changes

² <https://www.sciencedaily.com/releases/2024/02/240229182856.htm>

³ <https://www.helsinki.fi/en/news/biodiversity-loss/new-perspective-temperature-inside-tropical-forests>

⁴ <https://www.sciencedaily.com/releases/2024/01/240123122210.htm>

⁵ <https://www.uni-bonn.de/en/university/press-and-communications/press-service/archive-press-releases/2017/003-2017>

⁶ <https://www.sciencedaily.com/releases/2017/01/170105123158.htm>

⁷ <https://phys.org/news/2023-08-radio-disrupt-magnetic-migratory-birds.html>

⁸ <https://www.eurekalert.org/news-releases/1006582>

⁹ <https://www.sciencedaily.com/releases/2023/11/231108164156.htm>

¹⁰ <https://news.wsu.edu/press-release/2024/03/13/multiple-air-pollutants-linked-to-asthma-symptoms-in-children/>

¹¹ <https://www.sciencedaily.com/releases/2024/03/240313135515.htm>

¹² <https://njclimateresourcecenter.rutgers.edu/soils-could-be-affected-by-climate-change-impacting-water-and-food/>

and its effect in rain, the ability of soil to absorb water has reduced. And this again affects the food supply, ground water supplies storm water run-off.¹³

- Heat waves and cold spells exist near the shores of California – in the study conducted by California Polytechnic State University in August 2023¹⁴ it was submitted in their article published in Nature Scientific Reports that due to the climatic changes there has been increase in heat waves and cold spells in the seashores of California. This has impacted the marine ecosystem and made it tough habitat for various marine organisms.¹⁵
- Asian Elephants have been deprived of their habitat – in the article published in journal named Diversity and Distributions¹⁶ group of international Scientist researched and came to a conclusion that the change in climatic conditions and the ecosystem has affected the inhabitation of Asian elephants which is endangered already. The most affected areas for the habitat of these Asian Animals are India and Nepal.¹⁷
- Change in winter storms and water scarcity – in the journal named Weather and Climate Dynamics a study was published in march 2024¹⁸ in which it was brought to the concern that as day-to-day global warming increases there is change in weather and climatic condition that affects the regular monsoon. It was found that in the regular storm has increased by 60% which has made the air warmer and moister and this has resulted in high rainfall instead of snowfall. As the snowfall has not been as it used to be in December 2023 the country would face water scarcity in various parts of the state.¹⁹
- Disappearing coral reefs – the study shows that round 25% of the coral reef in the world has got vanished and in future around 60% of coral reef will disappear.²⁰

The above discussed changes that took place in ecosystem are only few examples and not the complete data. These are much sufficient to understand that the ecosystem which has to be common for all. It can be understood that the balanced ecosystem is not in existence. And in this present situation the whole group that belongs to this ecosystem lives in this condition.

Factors affecting ecosystem:

From the above discussion it is evident that there is imbalance ecosystem in present. Before knowing the impact of that it is important to understand the reasons and factors affecting ecosystem.²¹ There are various reasons that have ended up in this imbalanced ecosystem and they are:

¹³ <https://www.sciencedaily.com/releases/2019/09/190911151204.htm>

¹⁴ <https://ucm.calpoly.edu/news/cal-poly-study-analyzes-nearshore-california-marine-heat-waves-and-cold-spells-amid-changing#:~:text=The%20study%20found%20that%20certain,vital%20ecosystems%20critical%20to%20the>

¹⁵ <https://www.sciencedaily.com/releases/2023/08/230802105839.htm>

¹⁶ <https://journals.sagepub.com/doi/full/10.1177/1940082918822599>

¹⁷ <https://www.sciencedaily.com/releases/2019/02/190228113615.htm>

¹⁸ <https://www.jkpi.org/impact-of-delayed-winter-storms-on-north-indias-water-security/>

¹⁹ <https://www.sciencedaily.com/releases/2024/03/240311205204.htm>

²⁰ <https://www.theworldcounts.com/stories/impact-of-ecosystem-destruction>

²¹ <https://sciencing.com/factors-affecting-the-ecosystem-13428099.html>

- Pollution – this is one of the major reasons for ecological change. This is contributed by individuals as well as industries. Improper treatment and waste and improper disposal of the same results as pollutants and becomes toxic for the environment affecting the ecosystem.²²
- Deforestation - this is one of the most spoken issues, as forest contributes a lot towards the better ecosystem, cutting down the trees and removing the forest for various purposes affects the ecology as a whole and results in various issues including climatic changes.²³
- Exploitation of Natural resources – the ecosystem is made up of natural resources and continuous use of such natural resources for various purposes such as manufacturing, commercialization, converting into products, etc affects the available and reduces the resources available.²⁴
- Technology – the growth of technology plays a vital role in imbalanced ecosystem, as technology grows it has various disadvantages among which the electronic waves, radio waves and telephone waves affect the environment.²⁵
- Industrialization – the companies and manufacturing units plays a vital role in affecting the ecosystem. the above mentioned factors deforestation, depilation of natural resources, pollution are done or created when setting up various industries. Thus the growth in industrial sector can be considered as a one of the major factor for imbalanced ecosystem.

These are some of the important reasons or factors affecting the ecology and end up in the imbalanced ecosystem.

Impact of the imbalanced ecosystem:

As discussed earlier the ecosystem is a place where every living and non-living creature (abiotic) tend to support each other and live under one roof. But the degradation in ecosystem does not permit and fulfils the actual purpose of ecosystem. As seen in the above discussion it is evident that there is imbalanced ecosystem this not only affects the plants, animals or natural beings but at the end of the day it also affects the wellbeing of human.

The imbalanced ecosystem results in various impacts on all the creatures of the ecosystem and they are²⁶:

- Flooding gets escalated
- Increase in desertification
- Global warming gets amplified
- Increase in sea level
- Loss of biodiversity
- Health issues gets aggravated

²² <https://www.mdpi.com/2071-1050/14/24/16775>

²³ <https://www.roundsquare.org/ideals-challenge/round-square-environmentalism-sessions/task-five/biodiversity-and-deforestation/>

²⁴ <https://www.nature.com/articles/s41467-019-09246-2>

²⁵ https://www.researchgate.net/publication/295223499_Impact_of_Technology_on_Environment

²⁶ <https://www.theworldcounts.com/stories/impact-of-ecosystem-destruction>
https://www.researchgate.net/publication/323943659_Ecological_Imbalances_Causes_and_Consequences

- Decrease in agricultural products
- Disturbance in food chain
- Scarcity of food will become intensified
- Introduction of more Processed food
- Rise in soil degradation
- Shoot up in endangered species includes both flora and fauna
- Water scarcity becomes worsen
- Ozone layer becomes thinner

These are the summary of the impact of this imbalanced ecosystem which is present continues. This is not only limited to the above mentioned points, the imbalanced ecosystem also affects various aspects of human life.

Impact of imbalanced ecosystem on Economy:

More than other living species Human tend to depend a lot on the environment and the whole life of human is based on the environment he lives in, as there is imbalanced ecosystem humans face lots of issues. Apart from leading a healthy life, human tend to depend on the economy. The economy is a part of human life where in one hand if right to lead a health life is important on the other hand to lead satisfied life money is much needed. Thus it can be understood from history how human have played a vital role in developing economics to have a better lifestyle.²⁷ Though in wider aspect the concept of ecology and economics might not connect but when the study is conducted in detail the relationship between the ecology and economics can be understood.

The imbalanced ecosystem not only affects natural beings and naturally existing creatures it also affects the economics. The various factors that are being affected are²⁸:

- Agricultural outcome – it can be understood that various countries economy is dependent on the agriculture and the imbalanced economy results in failure in agriculture and its production. This again affects the economy of a particular state
- Natural resources – it is evident that many countries across the globe are dependent on the natural resources which are in existent. The natural resources includes fossil fuels, soils, forest, mines etc, and their economy is completely dependent on these natural resources, the excessive usage of these natural resources will definitely result in shortage of such natural resources that would affect the economy of the country dependent wholly on that.
- Ecological stocks – many institutions and companies are working towards the eco-friendly products, though they work for the betterment of society they still depend on the naturally available sources. As ecosystem is imbalanced these companies or industries would face various issues which would affect their investment and the shares issued by them. This in turn affects the people who have invested in these green shares or ecological stocks.
- Migration and increase in refugees – earlier the main purpose of migration was threat to life which was mainly due to war. But in recent times people started to migrate as

²⁷ https://www.researchgate.net/publication/323943659_Ecological_Imbalances_Causes_and_Consequences

²⁸ <https://ijcrt.org/papers/IJCRT2301392.pdf>

the homeland that they were living in does not support proper climatic conditions to life.²⁹ This has increased refugees which also affects the economy of countries that they leave as well as the hosting nation. The impact of climatic change and imbalanced ecosystem make it tough for people to live in.

Thus from the above discussion it could be concluded that imbalance ecosystem not only have natural impacts but also has economic impacts that affects the various economies.

Protection of Ecosystem in India:

India being a country of various habitation hosts various species and creatures of this world. The nation and its people have a fundamental duty provided under The Constitution to protect the Environment. And the state equally has a duty to play in protecting and conserving the environment. In order to protect the environment and to have a balanced ecosystem the nation has various laws related to environment they are³⁰:

- The Water (prevention and control of pollution) act, 1974
- The Air (prevention and control of pollution) act, 1981
- The Environment (protection) act, 1986
- The Wildlife Protection act, 1972
- The Forest (conservation) act, 1980
- The Hazardous Waste (management, handling and trans-boundary movement) rules, 2016
- The biological diversity act, 2002

These are the various laws that help in protecting the environment and contributes the goal towards the balanced ecosystem.

Global efforts in protecting ecosystem:

At International level countries have come together and have adopted various conventions in order to have a better environment. Each state has also contributed their part for the betterment of ecosystem.

Various conventions are signed at different period for protecting and having a balanced ecosystem and some of them are³¹:

- Ramsar Convention – it was signed in the year 1971 in order to conserve the wetlands and for better use of the same
- Stockholm Conference – which was signed in the year 1972 where around 26 agendas were adopted for protecting environment.
- Washington convention – this was signed in the year 1973 with the ultimate aim to protect animals and plants.
- World convention strategy - this was the first adopted convention that spoke about sustainable development and was signed in the year 1980
- Vienna convention for Ozone layer – which came in the year 1985 stressed the importance of preventing the damage in ozone layer.

²⁹ <https://www.unhcr.org/sites/default/files/legacy-pdf/3ae6a0d00.pdf>

³⁰ <https://www.lexisnexis.in/blogs/environmental-laws-in-india/>

³¹ <https://aida-americas.org/en/blog/international-environmental-law-history-and-milestones>

- Montreal Protocol – that came in the year 1987 also speaks about ozone layer and its protection
- Earth summit – was adopted in 1992 which focused on sustainable development and it is one of the biggest conference which spoke about the responsibilities of the state.
- UN World summit – in 2005 the states understood the need for protecting environment in a better way and adopted millennium development goals.
- Rio+20 – came in the year 2012 where states adopted new sets of suitable development goals
- UN climate Action Summit - this summit was adopted in 2009 and the main aim were to reduce greenhouse gas.
- G20 Leaders’ Summit – held in 2023 in which the concept of “ONE EARTH, ONE FAMILY, ONE FUTURE” was adopted where they spoke that the world is wide and it is for all including humans, animals, plants, and microorganisms.

Apart from these steps taken at international level, states together have also formed International Union for Conservation of Nature in with its members from both governmental and non-governmental organizations in order to protect the environment the main aim of this union is to work towards the betterment of ecosystem and to conserve the same. The organization has also achieved the resolution passed in 2020 on the concept of global ecosystem typology by the year 2021.

Thus it can be understood that at international level the states tries to contribute towards the balanced ecosystem.

Progress towards Global standard:

From the above it could be understood that all states together work towards the balanced ecosystem. Though the states are divided in various aspects and always works for their own economy as mentioned in G20 “one earth, one family and one future” every individual comes under the only roof “EARTH” and it is the duty of every state to protect the ecosystem. In order to have betterment in ecosystem and a balanced ecology it is the duty of each state to contribute equally in protecting the ecosystem. The global standard that has to be achieved is none other than a balanced ecosystem which would be common. As seen earlier for past 50+ years the states have started to adopt various conventions for protecting the environment now to achieve the global standard of balanced eco system the states have the primary duty of respecting those steps taken at international level. As of now adopting new laws or new convention is not much necessary as the existing ones are sufficient. Till date the states together have come and worked together on environment, from time to time they have adopted the needed policies in same method if the states work towards for the existing conventions and protocols and adopts new ones as per the need the global started of balanced ecosystem could be achieved.

Conclusion and Suggestions:

As seen from the very beginning it is understood clearly that ecosystem is a common ground where every organisms and creature has the equal importance. It’s important to have a balanced ecosystem and a better ecology compared to the present one. In order to achieve the balanced ecosystem it is understood that it is the role of humans to contribute. The concept of sustainable

development guarantees a good and healthy environment for the present as well as the future generation. In order to enjoy the balanced ecosystem it is the duty of each individual to protect the environment.

- Cess tax is implemented in order to raise funds which can be used for improving a specific department or sector, in general in present phase cess tax is levied for education and health care. Same way some percentage of cess tax can be levied for improving and maintain eco-system.
- It is notable that the international trade took a raise only when WTO was established. Though the nations had GATT earlier but only after WTO came into force it was very smooth for nations to enter into international trade agreements and all those were effectively implemented. Same way if a special institution is enacted for implementing and monitoring the international policies related to environmental development it would be much helpful as a whole.
- It can be understood from the previous topics that there have been various conventions, conference and summit held in order to develop the ecosystem. Though various policies and goals are accepted it is noted that none of the conventions or policies have implementation methods. It would be much helpful for the states when implementation methods are also suggested when goals are agreed.
- Technology transfer is one of the practices which are already in existence; this is used for making the technology available for all the nations. This method can be used for improving ecosystem and maintaining it. Developed nations can transfer the technologies that they use for improving ecosystem and maintaining it, at the same time developing countries and underdeveloped countries can transfer the traditional knowledge from the indigenous communities they have.
- There is a policy known as Green finance developed by UN environmental programme through this policy the creators of green intellectual properties get investors. Same way if the manufactures and businesses that are engaged in green development projects are financially helped and if the government of each states bring up policies helping them the development and growth in eco-friendly business will help in sustainable environment.
- At international level we know every state is independently sovereign but at the same time it is important to note that brining balance in ecosystem is the duty of all the state. For better working of every state, each state has to start question one another if they fail to protect the ecosystem.

Though if these suggestions are considerable and will be helpful for betterment, the protection of ecosystem apart from being a legal duty it as to be a moral duty. Only then a balanced ecosystem could be achieved which would help the present as well as future generation in all aspects.