



Nagindas Khandwala College
Of Commerce, Arts & Management Studies
Malad (West) , Mumbai – 400064

Project Report
ON
“TO STUDY THE ECOSYSTEM”

Presented by

MRUNAL SURVE

140

FYBAF B

Semester II

Project Guide

Prof. Krushita Desai

Submitted to

Nagindas Khandwala College

Academic Year

2022 – 2023

Acknowledgement

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Mrunal Surve



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Declaration by Learner

I Mrunal Surve Student of Nagindas Khandwala College, Semester II
of Class &Div. FYBAF B hereby declare that I have completed this
project on – “ECOSYSTEM”

In the Academic Year 2022– 2023.

The information submitted is true and original to the best of my knowledge.

Signature of Student



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Certificate

I Ms. Krushita Desai hereby certify that Ms. Mrunal Surve of FYBAF-
Foundation Course-II Semester II of Nagindas Khandwala College
has completed project on –“ECOSYSTEM”

In the academic year **2022 – 2023**.

The information submitted is true and original to the best of my knowledge.

Prof. Krushita Desai

Project Co-Ordinator



College stamp

Mrs. Poonam Shah

BAF Co-Ordinator

Dr. Mona Mehta

Vice Principal

Executive Summary

The summary we received on this project is that an Ecosystem consists of all the organisms and the abiotic pools with which they interact. The biotic and abiotic components are linked together through nutrient cycles and energy flow.

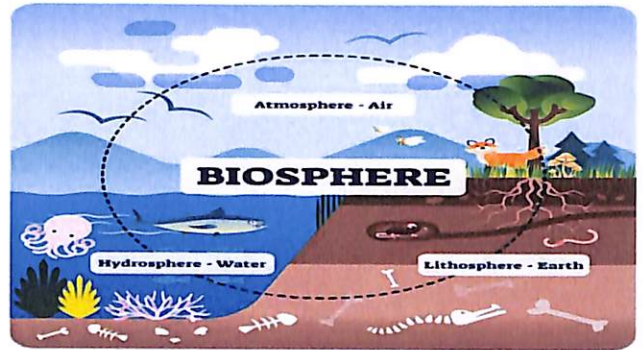
Our case study, the movie carbon: the story of tomorrow focuses on the prevailing environmental issues in Delhi. The film showcases scarcity of oxygen and water and its adverse effects on the environment and the forthcoming generations. This futuristic film portrays a scenario where there will be a dearth of oxygen and only carbon will prevail. Ecosystem processes are the transfers of energy and materials from one pool to another. Ecosystem processes are known to take place at a wide range of scales.

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INTRODUCTION

An ecosystem (or ecological system) consists of all the organisms and the physical environment with which they interact.⁴⁵⁸ These biotic and abiotic components are linked together through nutrient cycles and energy flows. Energy enters the system through photosynthesis and is incorporated into plant tissue. By feeding on plants and on one another, animals play an important role in the movement of matter and energy through the system. They also influence the quantity of plant and microbial biomass present. By breaking down dead organic matter, decomposers release carbon back to the atmosphere and facilitate nutrient cycling by converting nutrients stored in dead biomass back to a form that can be readily used by plants and microbes. Ecosystems are controlled by external and internal factors. External factors such as climate, parent material which forms the soil and topography, control the overall structure of an ecosystem but are not themselves influenced by the ecosystem. Internal factors are controlled, for example, by decomposition, root competition, shading, disturbance, succession, and the types of species present. While the resource inputs are generally controlled by external processes, the availability of these resources within the ecosystem is controlled by internal factors. Therefore, internal factors not only control ecosystem processes but are also controlled by them.



Ecosystems are dynamic entities—they are subject to periodic disturbances and are always in the process of recovering from some past disturbance. The tendency of an ecosystem to remain close to its equilibrium state, despite that disturbance, is termed its resistance. The capacity of a system to absorb disturbance and reorganize while undergoing change so as to retain essentially the same function, structure, identity, and feedbacks is termed its ecological resilience. Ecosystems can be studied through a variety of approaches—



theoretical studies, studies monitoring specific ecosystems over long periods of time, those that look at differences between ecosystems to elucidate how they work and direct manipulative experimentation. Biomes are general classes or categories of ecosystems. However, there is no clear distinction between biomes and ecosystems. Ecosystem classifications are specific kinds of ecological classifications that consider all four elements of the definition of ecosystems: a biotic component, an abiotic complex, the interactions between and within them, and the physical space

they occupy. Ecosystems provide a variety of goods and services upon which people depend. Ecosystem goods include the "tangible, material products" of ecosystem processes such as water, food, fuel, construction material, and medicinal plants. Ecosystem services, on the other hand, are generally "improvements in the condition or location of things of value". These include things like the maintenance of hydrological cycles, cleaning air and water, the maintenance of oxygen in the atmosphere, crop pollination and even things like beauty, inspiration and opportunities for research.

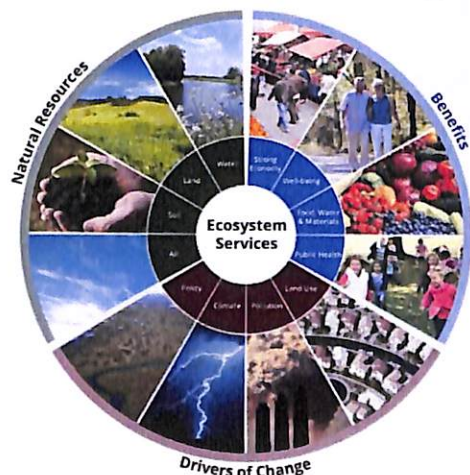
STATEMENT AND OBJECTIVE

- **To understand what is ecosystem**
- **To know more about function of the ecosystem**
- **To understand the process of environment**
- **To study and analysis the data of ecosystem**
- **To protect our environment and increase oxygen**

ANALYSIS AND OBJECTIVES

Management applications of ecosystem analysis commonly encompass large areas, which imposes a requirement that the types and accuracy of data match the available sources. Ecosystem analysis can provide through model simulations some estimates of important variables that are difficult to measure directly. For example, using hydrologic equilibrium theory, one can infer a balance that is commonly established among climatic properties, soil water holding capacity, and the maximum leaf area that forests will support. It is a seeming contradiction that these rather sophisticated ecosystem models and analytic tools are particularly valuable in data-poor areas. A handful of key measurements, some acquired by satellite and synthesized with a model, can allow an inference of ecosystem activity that would be nearly impossible to acquire through standard ground surveys. The first requirement in preparing for regional scale assessments is to construct a coordinated, geographically specific information base that includes the most important system attributes such as weather data, satellite imagery of the mosaic of vegetation and soils, snowpack depth, streamflow, and location of wildlife populations. Most established land management agencies have acquired a tremendous amount of these kinds of data, but they are often not available in a consistent, geographically referenced format. The second requirement is to maintain the array of ecosystem and environmental data in an immediately accessible form. Finally, ecological process models are needed that use the archived data sets and real-time information to project both near and long-term ecosystem responses. We will illustrate how these data sets are developed, archived, and utilized in models developed specifically for projecting regional ecosystem responses to changing conditions, including both natural disturbances and those associated with management policies.

An ecological system has a richly detailed series of inputs and outputs of energy and matter. Because of the lack of precise information about these relationships and the internal functions that maintain the ecosystem, it is often difficult to assess the impact of human activities on the biosphere. As a result, land-use managers and planners often cannot take into account or even foresee the full range of consequences a project may have. Without full information, the traditional practice in the management of land resources has been to emphasize strategies that maximize the output of some desirable product or service and give little or no thought to the long-term secondary effects. As a result often there is much conflict between conservation and management goals. For example, in an all-out effort to increase food production, drainage waters carry large burdens of pollutants from fertilizers, pesticides, and farm wastes. Forests may be cut with inadequate perception of the effects on regional water supplies, wildlife, recreation, and aesthetic values. And despite recent regulations to protect wetlands, they have been converted worldwide to commercial use with little concern over important hydrologic, values lost in the conversion.



The immediate goal of ecosystem analysis studies is to understand ecosystems and ecosystem processes ; many of these goals are directly related to such applied problems as organic matter production or the influence of management practices on various ecosystem parameters. A beginning point for such studies must be research design. We first ask what has to be done to accomplish our goals. Oftentimes, subject matter will dictate the strategy. In this case, scientists must work together in multidisciplinary teams, study whole ecosystems (parts cannot be left out for lack of interest, personnel, or technology), share data immediately and completely, and devote a considerable effort to the process of synthesis. Systems oriented techniques with high-speed computers offer the only means by which this synthesis can be accomplished. Ecosystem analysis is a mix of biogeochemistry, ecophysiology, and micrometeorology that emphasizes “the circulation, transformation, and accumulation of energy and matter through the medium of living things and their activities. By taking this course you will increase your understanding of the physical,



chemical and biological processes or events that link organisms and their environment. Through a combination of lectures and exercises you will gain both theoretical and practical understanding of ecosystems and ecosystem analysis. You will learn about ecosystem processes, ecosystem-atmosphere exchange, aquatic systems and biogeography. You will also carry out an individual literature project that will teach you how to assess and draw conclusions from scientific literature. After taking the course you should also be able to understand how ecosystems function and discuss how they may respond to a changing climate and environment. CCOE Civil-Military Cooperation Centre of Excellence
Show navigation

HOME CONCEPTS, INTEROPERABILITY, CAPABILITIES CIVIL MILITARY COOPERATION CENTRE OF EXCELLENCE ADVANCED-CULTURAL-COMPETENCE-AACECOSYSTEM ANALYSIS

Ecosystem Analysis

Ecosystem Analysis (the Ecosystem Approach) is considered an important aspect by CCOE within its Advanced Cultural Competence programme. The rationale of the Ecosystem Approach becomes clear quickly when one examines the purpose of military operations: ensuring security and stability in conflict sensitive areas to enable civil society to thrive. It is a fact that no security can exist without ecological security: ecosystems provide products and services on which all people depend to maintain their living. Examples of what products and services people get from ecosystems are: ecological clean water, food, and shelter. When people do not longer have access to these crucial necessities, it becomes impossible for them to create a living environment that can be sustained. In other words: there is no stability without sustainability. Therefore, in military operations, a comprehensive approach should be applied in order to consider impacts on the environment and stimulate the sustainable use of resources. This has been recognized as

crucial fact by global organizations such as IUCN (International Union on the Conservation of Nature), UNEP (United Nations Environment Programme) and IISD (International Institute for Sustainable Development).

Examining the environment and conflict situations shows that, often, there are clear links and interactions: environmental issues for instance can act as a (partial) cause of a conflict to occur, which is happening widespread nowadays with increasing ecological insecurity due to climate change impacts. During conflict, military operations can have both negative and advantageous impacts on the environment:

Negative impacts can be fourfold:

Pollution (physical, chemical, biological, nuclear)

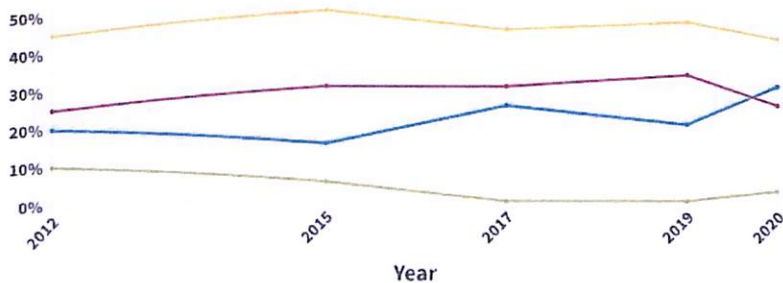
Destruction (e.g. forest cut off to provide for firewood needs in camps)

Over-utilisation (e.g. around refugee camps)

Fragmentation (disruption of ecological connectivity)

Percent of Ecosystems from Continent among Top Global Ecosystems

■ Asia-Pacific ■ Europe ■ North America ■ South America



Startup Genome

Source: www.startupgenome.com

Advantageous impacts are for instance:

Military infrastructure providing for unique habitats for animals
Conservation/protection of nature areas due to isolation (e.g. no-go areas)

Especially when negative impacts are thriving during conflict situations, this can, combined with unstable management

and institutional practices, lead to prolonged or new conflicts due to 'new' insecurity issues in particular areas.

8The emission of greenhouse gases (GHG) including carbon dioxide, methane, nitrous oxide, tropospheric ozone and chlorofluorocarbons and their effect on the atmosphere is the leading cause of climate change (Walther et al., 2005; Warren et al., 2013). Estimates of the contribution from cities to global GHG emissions vary from 30% to as high as 80% (de la Rue du Can & Price, 2008; Satterthwaite, 2008; Spiegelhalter & Arch, 2010). This is due to the construction and operation of buildings accounting for high energy consumption and large production of waste (Bulkeley & Betsill, 2005; Ewing et al., 2008). Up to 40% of all energy and material resources are used to construct and operate buildings and up to 40% of total solid waste results from construction and demolition activities (UNEP, 2011). Construction and demolition waste can contribute to climate change either through the emission of GHGs as materials decompose, or due to the release over time of fluorinated gases with a high potential for global warming from certain construction- and demolition- (2011) states that: "The global use of natural resource materials increased by over 40%

between 1992 and 2005, from about 42 to nearly 60 thousand million tonnes. On a per capita basis, the increase was 27%. ... There has been a major increase in extraction of construction minerals of almost 80%.” (p.16) Building sector carbon emissions including those from energy generation used to power buildings have increased by 2% per annum since 1970, while emissions from commercial buildings have increased by 3% per annum since 2002 (Levine et al., 2007). This is a higher growth rate than that of the global human population, which has varied from approximately 1.8% per annum in 1970 to slightly more than 1% in 2011. This suggests that buildings have become higher energy consumers and/or that building floor area is increasing. High rates of impervious surfaces in urban areas contribute to several ecological issues. In terms of climate change, expanding impervious areas could potentially reduce soil carbon pools by up to 66% (Seto et al., 2012). The design of urban environments also contributes to how private vehicles, most of which are powered by burning fossil fuels are used, leading to further built environment-related GHG emissions(Baur et al., 2014; Ewing & Rong, 2008; Steemers, 2003).

CASE STUDY

CARBON : The Story Of Tomorrow

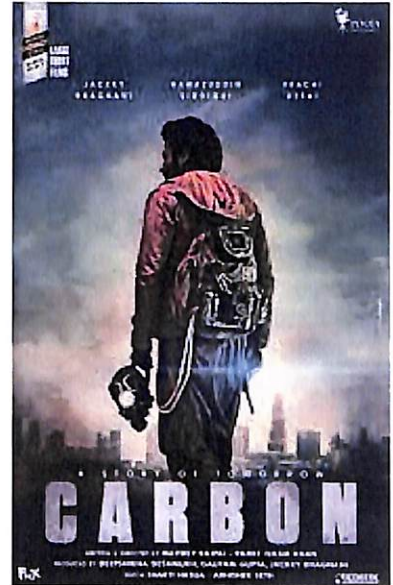
CARBON: The Story of Tomorrow is a documentary film directed by Peter Byck that explores the current state of carbon emissions and the impact that they have on the environment. The film takes a comprehensive approach to its subject matter, examining the impact of carbon emissions on the planet while also exploring a range of initiatives and technologies that are working to reduce carbon emissions and mitigate the impacts of climate change.

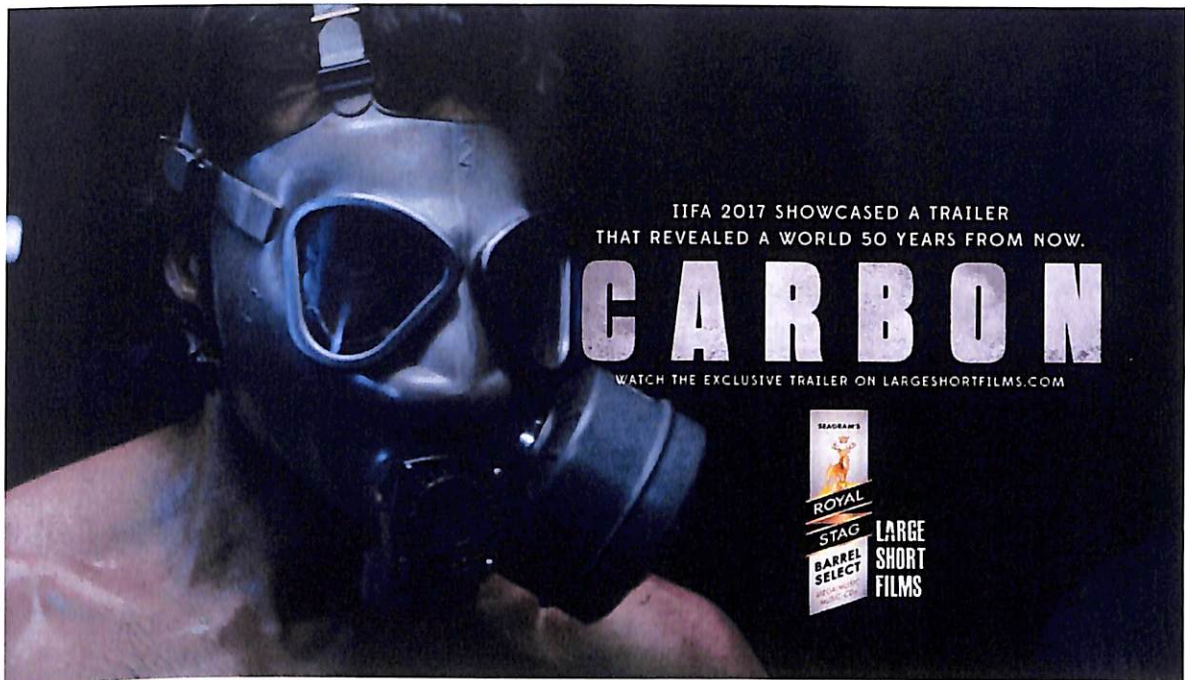
The film begins with a discussion of the impact of carbon emissions on the environment, including the increased frequency of extreme weather events, melting glaciers, and rising sea levels. It presents a range of alarming statistics that demonstrate the scale of the problem, including the fact that carbon dioxide levels in the atmosphere are higher than they have been in over 800,000 years.

However, despite the grim picture that the film paints, it is ultimately a hopeful and optimistic documentary that presents a range of solutions to the problem of carbon emissions. One of the key themes of the film is regenerative agriculture, which involves using farming practices that work in harmony with the natural ecosystem. The film features a number of farmers who have successfully implemented these practices and have seen improvements in their yields and profits while also reducing their carbon footprint.

One of the key takeaways from this section of the film is the importance of soil health in reducing carbon emissions. The film explains that healthy soil acts as a carbon sink, sequestering carbon dioxide from the atmosphere and storing it in the soil. By implementing regenerative agriculture practices, farmers can improve soil health and reduce carbon emissions at the same time.

The film also features a discussion on electric vehicles and the benefits of transitioning from traditional gas-powered cars to electric vehicles. It includes interviews with industry experts and highlights various electric vehicle initiatives from around the world. One of the key messages from this section of the film is that electric vehicles are becoming more affordable and accessible, making it easier for consumers to make the switch.





Another focus of the film is on the use of carbon capture technology, which involves capturing carbon dioxide emissions and storing them underground. The film features interviews with scientists and researchers who are working on developing and improving this technology. One of the key messages from this section of the film is that carbon capture technology is not a silver bullet solution to the problem of carbon emissions, but rather one tool in a range of solutions.

Overall, **CARBON: The Story of Tomorrow** is a well-produced documentary that presents a hopeful and optimistic outlook on the future of our planet. It showcases various initiatives and technologies that are currently being implemented and developed to reduce carbon emissions and mitigate the impacts of climate change. The film does an excellent job of presenting a range of perspectives on the issue of carbon emissions and climate change, including farmers, scientists, and industry leaders.

One of the strengths of the film is its focus on solutions rather than just highlighting the problem. It presents a range of initiatives and technologies that are already making a positive impact and provides examples of how they can be scaled up and implemented more widely. This approach is important because it helps to demonstrate that the problem of carbon emissions is not insurmountable and that there are solutions available that can make a difference.

However, one potential weakness of the film is that it does not fully explore the barriers and challenges to implementing these solutions on a wider scale. While it highlights some of the success stories, it does not delve into the political and economic challenges that can make it difficult to scale up these initiatives. For example, the film briefly touches on the issue of government subsidies for the fossil fuel industry, but it does not explore this issue in depth.

LEARNING

An ecosystem refers to the complex network of living and nonliving components that make up a particular environment. It involves the study of how living organisms interact with each other and their environment. One of the key ideas in ecology is that all living things are interconnected, and changes to one part of an ecosystem can have ripple effects throughout the entire system. Human activities can have significant impacts on ecosystems, and understanding the intricacies of ecosystems and the ways in which human actions can affect them is crucial for promoting sustainability and preserving the health of the planet. Ecological research can provide valuable insights into how ecosystems function, how species interact with each other and their environment, and how we can work to conserve biodiversity and promote sustainable practices. Ecology is the study of how living organisms interact with each other and their environment. The concept of an ecosystem is central to ecology, as it refers to the complex network of living and nonliving components that make up a particular environment.

One of the key ideas in ecology is that all living things are interconnected, and changes to one part of an ecosystem can have ripple effects throughout the entire system. For example, if a predator species disappears from an ecosystem, the populations of its prey species may increase unchecked, leading to overpopulation and potentially causing other environmental problems.

Another important aspect of ecosystem learning is the recognition that human activities can have significant impacts on ecosystems. Pollution, habitat destruction, and overexploitation of resources are just a few examples of how humans can negatively affect ecosystems and the species that depend on them. As such, understanding the intricacies of ecosystems and the ways in which human actions can affect them is crucial for promoting sustainability and preserving the health of the planet.

Ecological research can also provide valuable insights into how ecosystems function, how species interact with each other and their environment, and how we can work to conserve biodiversity and promote sustainable practices. For example, studying the behavior and migration patterns of animals can help us.

CONCLUSION

Everyone in the world depends completely on Earth's ecosystems and the services they provide, such as food, water, disease management, climate regulation, spiritual fulfillment, and aesthetic enjoyment. Over the past 50 years, humans have changed these ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing demands for food, fresh water, timber, fiber, and fuel. This transformation of the planet has contributed to substantial net gains in human well-being and economic development. But not all regions and groups of people have benefited from this process -in fact, many have been harmed. Moreover, the full costs associated with these gains are only now becoming apparent. So it is better that care for ecosystem should be taken as one of the major responsibility of every individual for sustainable living of future generations as well. Human activities are important in almost all ecosystems. Although humans exist and operate within ecosystems, their cumulative effects are large enough to influence external factors like climate.