



STUDENT STUDY PROJECT

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Title of the project: Natural resource

SN	Name of the student	Year	Group	Medium	Roll No
1	Pamula Pradeep	III	MCCS	EM	7
2	Guduri Abhiram	III	MPC	TM	17
3	Moka Sai Krishna	III	MPC	TM	24

Guided by: Ch. Udaya Bhaskar Rao

Natural resource

Primary resource" redirects here. For original sources used in research, see Primary source.



The rainforest in Fatu-Hiva, in the Marquesas Islands, is an example of an undisturbed natural resource. Forest provides timber for humans, food, water and shelter for the flora and fauna tribes and animals. The nutrient cycle between organisms form food chains and foster a biodiversity of species.



The Carson Fall in Mount Kinabalu, Malaysia is an example of undisturbed natural resources. Waterfalls provide spring water for humans, animals and plants for survival and also habitat for marine organisms. The water current can be used to turn turbines for hydroelectric generation.



The ocean is an example of a natural resource. Ocean waves can be used to generate wave power, a renewable energy source. Ocean water is important for salt production, desalination, and providing habitat for deep-water fishes. There is biodiversity of marine species in the sea where nutrient cycles are common.



A picture of the Udachnaya pipe an open-pit diamond mine in Siberia. An example of a non-renewable natural resource

Natural resources are resources that exist without any actions of humankind. This includes the sources of valued characteristics such as commercial and industrial use, aesthetic value, scientific interest and cultural value. On Earth, it includes sunlight, atmosphere, water, land, all minerals along with all vegetation, and animal life.

Natural resources can be part of our natural heritage or protected in nature reserves. Particular areas (such as the rainforest in Fatu-Hiva) often feature biodiversity and geodiversity in their ecosystems. Natural resources may be classified in different ways. Natural resources are materials and components (something that can be used) that can be found within the environment. Every man-made product is composed of natural resources (at its fundamental level).

A natural resource may exist as a separate entity such as fresh water, air, as well as any living organism such as a fish, or it may be transformed by extractives into an economically useful form that must be processed to obtain the resource such as metal ores, rare-

earth elements, petroleum, timber and most forms of energy. Some resources are renewable resource, which means that they can be used at a certain rate and natural processes will restore them, whereas many extractive industries rely heavily on non-renewable resources that can only be extracted once.

Natural-resource allocations can be at the center of many economic and political confrontations both within and between countries. This is particularly true during periods of increasing scarcity and shortages (depletion and overconsumption of resources). Resource extraction is also a major source of human rights violations and environmental damage. The sustainable development goals and other international development agendas frequently focus on creating more sustainable resource extraction, with some scholars and researchers focused on creating economic models, such as circular economy, that rely less on resource extraction, and more on reuse, recycling and renewable resources that can be sustainably managed.

Classification

There are various methods of categorizing natural resources. These include the source of origin, stage of development, and by their renewability.

On the **basis of origin**, natural resources may be divided into two types:

- *Biotic* — Biotic resources are obtained from the biosphere (living and organic material), such as forests and animals, and the materials that can be obtained from them. Fossil fuels such as coal and petroleum are also included in this category because they are formed from decayed organic matter.
- *Abiotic* – Abiotic resources are those that come from non-living, non-organic material. Examples of abiotic resources include land, fresh water, air, rare-earth elements, and heavy metals including ores, such as gold, iron, copper, silver, etc.

Considering their **stage of development**, natural resources may be referred to in the following ways:

- *Potential resources* — Potential resources are those that may be used in the future—for example, petroleum in sedimentary rocks that, until drilled out and put to use remains a *potential* resource
- *Actual resources* — Those resources that have been surveyed, quantified and qualified, and are currently used in development, such as wood processing, and are typically dependent on technology
- *Reserve resources* — The part of an actual resource that can be developed profitably in the future
- *Stock resources* — Those that have been surveyed, but cannot be used due to lack of technology—for example, hydrogen

On the **basis of recovery rate**, natural resources can be categorized as follows:

- *Renewable resources* — Renewable resources can be replenished naturally. Some of these resources, like sunlight, air, wind, water, etc. are continuously available and their quantities are not noticeably affected by human consumption. Though many renewable resources do not have such a rapid recovery rate, these resources are susceptible to depletion by over-use. Resources from a human use perspective are classified as renewable so long as the rate of replenishment/recovery exceeds that of the rate of consumption. They replenish easily compared to non-renewable resources.
- *Non-renewable resources* – Non-renewable resources either form slowly or do not naturally form in the environment. Minerals are the most common resource included in this category. From the human perspective, resources are non-renewable when their rate of consumption exceeds the rate of replenishment/recovery; a good example of this are fossil fuels, which are in this category because their rate of formation is extremely slow (potentially millions of years), meaning they are considered non-renewable. Some resources naturally deplete in amount without human interference, the most notable of these being radio-active elements such as uranium, which naturally decay into heavy metals. Of these, the metallic minerals can be re-used by recycling them,¹ but coal and petroleum cannot be recycled. Once they are completely used they take millions of years to replenish.

Extraction

Resource extraction involves any activity that withdraws resources from nature. This can range in scale from the traditional use of preindustrial societies to global industry. Extractive industries are, along with agriculture, the basis of the primary sector of the economy. Extraction produces raw material, which is then processed to add value. Examples of extractive industries are hunting, trapping, mining, oil and gas drilling, and forestry. Natural resources can add substantial amounts to a country's wealth; however, a sudden inflow of money caused by a resource boom can create social problems including inflation harming other industries ("Dutch disease") and corruption, leading to inequality and underdevelopment, this is known as the "resource curse".

Extractive industries represent a large growing activity in many less-developed countries but the wealth generated does not always lead to sustainable and inclusive growth. People often accuse extractive industry businesses as acting only to maximize short-term value, implying that less-developed countries are vulnerable to powerful corporations. Alternatively, host governments are often assumed to be only maximizing immediate revenue. Researchers argue there are areas of common interest where development goals and business cross. These present opportunities for international governmental agencies to engage with the private sector and host governments through revenue management and expenditure accountability, infrastructure development, employment creation, skills and enterprise development, and impacts on children, especially girls and women. A strong civil society can play an important role in ensuring the effective management of natural resources. Norway can serve as a role model in this regard as it has good institutions and open and dynamic public debate with strong civil society actors that provide an effective checks and balances system for the

government's management of extractive industries, such as the Extractive Industries Transparency Initiative (EITI), a global standard for the good governance of oil, gas and mineral resources. It seeks to address the key governance issues in the extractive sectors.

Depletion of resources

In recent years, the depletion of natural resources has become a major focus of governments and organizations such as the United Nations (UN). This is evident in the UN's Agenda 21 Section Two, which outlines the necessary steps for countries to take to sustain their natural resources.^[10] The depletion of natural resources is considered a sustainable development issue. The term sustainable development has many interpretations, most notably the Brundtland Commission's 'to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs' however, in broad terms it is balancing the needs of the planet's people and species now and in the future. In regards to natural resources, depletion is of concern for sustainable development as it has the ability to degrade current environments and the potential to impact the needs of future generations.



Depletion of natural resources is associated with social inequity. Considering most biodiversity are located in developing countries, depletion of this resource could result in losses of ecosystem services for these countries. Some view this depletion as a major source of social unrest and conflicts in developing nations.

At present, there is a particular concern for rainforest regions that hold most of the Earth's biodiversity. According to Nelson, deforestation and degradation affect 8.5% of the world's forests with 30% of the Earth's surface already cropped. If we

consider that 80% of people rely on medicines obtained from plants and $\frac{3}{4}$ of the world's prescription medicines have ingredients taken from plants,¹ loss of the world's rainforests could result in a loss of finding more potential life-saving medicines.

The depletion of natural resources is caused by 'direct drivers of change' such as mining, petroleum extraction, fishing, and forestry as well as 'indirect drivers of change' such as demography (e.g. population growth), economy, society, politics, and technology. The current practice of agriculture is another factor causing depletion of natural resources. For example, the depletion of nutrients in the soil is due to excessive use of nitrogen and desertification. The depletion of natural resources is a continuing concern for society. This is seen in the cited quote given by Theodore Roosevelt, a well-known conservationist and former United States president, who was opposed to unregulated natural resource extraction.



Protection

The World Charter for Nature, which recognized the need to protect nature from further depletion due to human activity. It states that measures must be taken at all societal levels, from international to individual, to protect nature. It outlines the need for sustainable use of natural resources and suggests that the protection of resources should be incorporated into national and international systems of

law. To look at the importance of protecting natural resources further, the World Ethic of Sustainability, developed by the IUCN, WWF and the UNEP in 1990, set out eight values for sustainability, including the need to protect natural resources from depletion. Since the development of these documents, many measures have been taken to protect natural resources including establishment of the scientific field and practice of conservation biology and habitat conservation, respectively.

Conservation biology is the scientific study of the nature and status of Earth's biodiversity with the aim of protecting species, their habitats, and ecosystems from excessive rates of extinction.

The term *conservation biology* was introduced as the title of a conference held at the University of California, San Diego, in La Jolla, California, in 1978, organized by biologists Bruce A. Wilcox and Michael E. Soulé.

Habitat conservation is a land management practice that seeks to conserve, protect and restore habitat areas for wild plants and animals, especially conservation reliant species, and prevent their extinction, fragmentation or reduction in range

Management

Natural resource management is a discipline in the management of natural resources such as land, water, soil, plants, and animals—with a particular focus on how management affects quality of life for present and future generations. Hence, sustainable development is followed according to judicious use of resources to supply both the present generation and future generations. The disciplines of fisheries, forestry, and wildlife are examples of large sub disciplines of natural resource management.

Management of natural resources involves identifying who has the right to use the resources, and who does not, for defining the boundaries of the resource. The resources may be managed by the users according to the rules governing when and how the resource is used depending on local condition or the resources may be managed by a governmental organization or other central authority.

A "...successful management of natural resources depends on freedom of speech, a dynamic and wide-ranging public debate through multiple independent media channels and an active civil society engaged in natural resource issues...", because of the nature of the shared resources the individuals who are affected by the rules can participate in setting or changing them. The users have rights to devise their own management institutions and plans under the recognition by the government. The right to resources includes land, water, fisheries and pastoral rights. The users or parties accountable to the users have to actively monitor and ensure the utilization of the resource compliance with the rules and to impose penalty on those peoples who violate the rules.^[30] These conflicts are resolved in a quick and low cost manner by the local institution according to the seriousness and context of the offence. The global science-based platform to discuss natural resources management is the World Resources Forum, based in Switzerland.

Nature conservation



Nature conservation is the moral philosophy and conservation movement focused on protecting species from extinction, maintaining and restoring habitats, enhancing ecosystem services, and protecting biological diversity. A range of values underlie conservation, which can be guided by biocentrism, anthropocentrism, egocentrism, and sentientism, environmental ideologies that inform eco cultural practices and identities. There has recently been a movement towards evidence-based conservation which calls for greater use of scientific evidence to improve the effectiveness of conservation efforts. As of 2018 15% of land and 7.3% of the oceans were protected. Many environmentalists set a target of protecting 30% of land

ENVIRONMENTAL MOVEMENT

The **environmental movement** (sometimes referred to as the **ecology movement**), also including conservation and green politics, is a diverse philosophical, social, and political movement for addressing environmental issues. Environmentalists advocate the just and sustainable management of resources and stewardship of the environment through changes in public policy and individual behaviour. In its recognition of humanity as a participant in (not enemy of) ecosystems, the movement is centered on ecology, health, and human rights.

The environmental movement is an international movement, represented by a range of organizations, from enterprises to grassroots and varies from country to country. Due to its large membership, varying and strong beliefs, and occasionally speculative

nature, the environmental movement is not always united in its goals. The movement also encompasses some other movements with a more specific focus, such as the climate movement. At its broadest, the movement includes private citizens, professionals, religious devotees, politicians, scientists, nonprofit organizations, and individual advocates.

Formation of environmental protection societies

The late 19th century saw the formation of the first wildlife conservation societies. The zoologist Alfred Newton published a series of investigations into the *Desirability of establishing a 'Close-time' for the preservation of indigenous animals* between 1872 and 1903. His advocacy for legislation to protect animals from hunting during the mating season led to the formation of the Plumage League (later the Royal Society for the Protection of Birds) in 1889. The society acted as a protest group campaigning against the use of great crested grebe and kittiwake skins and feathers in fur clothing

Another major literary force in the promotion of the environmental movement was Rachel Carson's *Silent Spring* about declining bird populations due to DDT, an insecticide, pollutant, and man's attempts to control nature through the use of synthetic substances. Her core message for her readers was to identify the complex and fragile ecosystem and the threats facing the population. In 1958, Carson started to work on her last book, with an idea that nature needs human protection. Her influence was radioactive fallout, smog, food additives, and pesticide use. Carson's main focus was on pesticides, which led her to identify nature as fragile and the use of technology dangerous to humans and other species.^[26]

Both of these books helped bring the issues into the public eye Rachel Carson's *Silent Spring* sold over two million copies and is linked to a nationwide ban on DDT and the creation of the EPA.



Earth Day 2007 at City College, San Diego

Beginning in 1969 and continuing into the 1970s, Illinois-based environmental activist James F. Phillips engaged in numerous covert anti-pollution campaigns using the pseudonym "the Fox." His activities included plugging illegal sewage outfall pipes and dumping toxic wastewater produced by a US Steel factory inside the company's Chicago corporate office. Phillips' "ecotage" campaigns attracted considerable media attention and subsequently inspired other direct action protests against environmental destruction.

The first Earth Day was celebrated on 22 April 1970. Its founder, former Wisconsin Senator Gaylord Nelson, was inspired to create this day of environmental education and awareness after seeing the oil spill off the coast of Santa Barbara in 1969. Greenpeace was created in 1971 as an organization that believed that political advocacy and legislation were ineffective or inefficient solutions and supported non-violent action. 1980 saw the creation of Earth First!, a group with an eco centric view of the world – believing in equality between the rights of humans to flourish, the rights of all other species to flourish and the rights of life-sustaining systems

MINING

Mining is the extraction of valuable minerals or other geological materials from the Earth, usually from an ore body, lode, vein, seam, reef, or placer deposit. Exploitation of these deposits for raw material is based on the economic viability of investing in the equipment, labor, and energy required to extract, refine and transport the materials found at the mine to manufacturers who can use the material.

Ores recovered by mining include metals, coal, oil shale, gemstones, limestone, chalk, dimension stone, rock salt, potash, gravel, and clay. Mining is required to obtain most materials that cannot be grown through agricultural processes, or feasibly created artificially in a laboratory or factory. Mining in a wider sense includes extraction of any non-renewable resource such as petroleum, natural gas, or even water. Modern mining processes involve prospecting for ore bodies, analysis of the profit potential of a proposed mine, extraction of the desired materials, and final reclamation of the land after the mine is closed.

Mining operations usually create a negative environmental impact, both during the mining activity and after the mine has closed. Hence, most of the world's nations have passed regulations to decrease the impact; however, the outsized role of mining in generating business for often rural, remote or economically depressed communities means that governments sometimes fail to fully enforce regulation. Work safety has long been a concern as well, and where enforced modern practices have significantly improved safety in mines.

