

A STUDY ON ADOPTING TECHNOLOGICAL SUSTAINABLE PRACTICES FOR EFFICIENT USE OF NATURAL RESOURCES IN INDIA

Dr. Rashmi Dongre, Assistant Professor, Dept.of Computer Science, Tilak Maharashtra Vidyapeeth, Mail: rashmibichkar15@gmail.com

Dr. Asmita Namjoshi, Associate Professor, Dept.of Computer Science, Tilak Maharashtra Vidyapeeth, Mail: asmita03@gmail.com

Dr. Supriya Nagarkar, Assistant Professor, Dept.of Computer Science, Tilak Maharashtra Vidyapeeth, Mail: supriyanagarkar@gmail.com

ABSTRACT:

An area's economy is determined by its resources. A nation can preserve these resources for future generations if these resources are used wisely. However, given the current conditions, it is extremely unlikely that future generations and emerging nations would be able to get their fair share due to the careless use of our contemporary resources. Furthermore, the repercussions are terrible, and the impact on the ecosystem will cause serious harm that exceeds the environment's carrying capacity. We have all heard various stories about how the natural ecosystems of the globe are coming under increasing pressure to sustainably feed a growing population. For a community to remain sustainable, natural resources must be preserved or managed. In the twenty-first century, the idea of sustainability has emerged as the go-to remedy for the world's environmental and economic crises. Since its conception, a flood of studies and literature have been published on the nebulousness and ambiguity of its definition and applicability. Emerging digital technologies are assisting enterprises, governments, and communities in managing natural resources. The sustainable use of natural resources through technology in India is a key component of sustainable development, and this research study takes a conceptual approach to it.

Keywords: Sustainability, Natural resource, Climate change, Industrialization, Consumption

INTRODUCTION:

Natural resources are frequently seen as important assets promoting growth and wealth creation. Natural resource utilization has traditionally been seen as important to both economic development and human rights. Resource utilization grew over time and with the advance of industrialization. In terms of natural resource usage, India is ranked fourth as shown in Fig. 1.

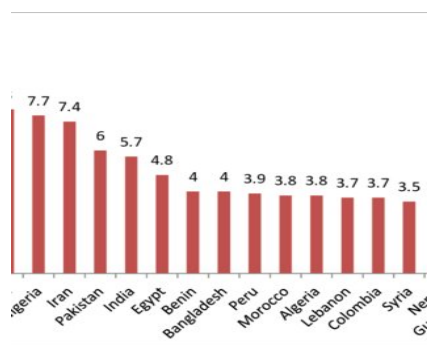


Fig 1 Total Natural Resource Consumption

In certain instances, resource utilization levels eventually surpassed their normal regeneration rates. In the end, such overexploitation jeopardizes ecosystem health as well as the livelihoods and well-being of people who depend on these resources [1].

What does it mean to use natural resources sustainably? The following two instances show how different people have responded to this question: "The usage of renewable resources should not be greater than the rates of the resources' regenerative processes." Additionally, "The use of nonrenewable resources should not be increased beyond the rate at which their renewable equivalents (if any) are generated."

These kinds of requirements all share one thing in common: they are incredibly difficult to put into practice. This does not necessarily imply that they are wrong or useless. The issue is that they don't adequately account for the actual complexity of resource use since they are too broadly formulated, too abstract, and too straightforward [5].

The sustainability of natural resources may be impacted by changing biophysical, social, and technological contexts. This study examines international and multidisciplinary research evidence of this potential impact and investigates how such evidence may be applied nationally to shape policy.

LITERATURE REVIEW:

Natural Resources: Earth's Biggest Assets:

Natural resources are defined as things that can be used by humans, freely in nature and are not necessarily produced or created by humans. Natural resources are important because they influence whether people and other life forms on planet will survive [8]

Land, rocks, woods (vegetation), water (ocean, lakes, streams, seas, and rivers), fossil fuel, fish, wild animals, domesticated animals, minerals, sunlight, and air are some of these resources. Humans gather and generate the elements and materials that make up our environments from natural resources [7]. Natural resources are used to make every artificial product. The materials can be used in their natural state or they can be changed into different forms.

However, the majority of natural resources are vulnerable to degradation and depletion, which has raised questions about how to use and manage them sustainably on a global scale [10].

An international study warns that because people are utilizing the planet's natural resources excessively, India is on course for a "ecological credit crisis" that will be far worse than the current financial or economic problems. According to the Living Planet report, humans use 30% more resources annually than the planet can replace, which results in deforestation, damaged soils, contaminated air and water, and sharp losses in fish and other species.

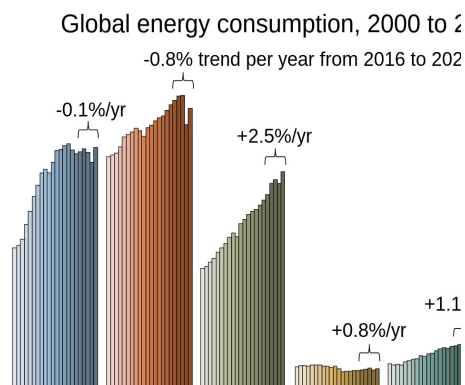


Fig.2 Global Energy consumption

The issue is also getting worse as populations and consumption continue to rise more quickly than technology can develop new methods of maximizing what can be produced from the natural world, as seen in Fig. 2.

Threats to Natural Resource:

Our need for natural resources increased over time as the planet changed and human lifestyles became more complicated [3]. Today, we have reached a point where there are many threats to our natural resources.

Climate change:

Climate change, in the words of NASA, "is the change in the typical meteorological conditions of an area." Since the beginning of time, our climate has changed, but the changes we are currently experiencing are due to human activity rather than natural climate change.

Climate change occurs when Earth's natural mechanism for maintaining temperature is disrupted [6]. Our glaciers are melting more quickly than ever; according to the Intergovernmental Panel on Climate Change's (IPCC) most recent report. The water level will rise as a result, further impacting and flooding low-lying communities.

Environmental population:

Because of land pollution, the soil is not very productive. It also renders it sterile and barren. Our aquatic ecosystem is harmed by water pollution [5]. The presence of various harmful chemicals in the air as a result of air pollution makes breathing difficult. If this continues, we will be required to wear masks at all times. 92% of the world's population already experiences some amount of air pollution, according to the WHO.

Habitat loss of species:

Numerous groups are working to rescue certain species. The IUCN keeps a "Red-data book" that contains a list of all the species that are endangered or on the verge of going extinct. They run a number of campaigns and pressure governments to take action to protect endangered species [9].

Deforestation:

Man-made deforestation, which is carried out for mining and building purposes, is defined as the large-scale clearing of forests to create space for human activity. Our natural resources are at risk from this form of deforestation.

Loss of coral reefs:

The most beautiful parts of the ocean are coral reefs, which feed 25% of the world's fish [2]. They are sometimes referred to as "seaside rain forests." Ocean pollution and warming waters are the two main causes of coral reef deterioration. The contaminated flow into the ocean caused by the expansion of more and more companies kills these corals.

Corals take decades to form, yet they can easily die, therefore it's crucial to protect them. Coral reef destruction has a catastrophic impact on the marine ecology. Countries' coastlines are shielded by corals. As a result of their disappearance, the coastline will erode, eventually causing coastal areas to be submerged under the water.

RESEARCH METHODOLOGY:

This study refers the secondary data collection and type of research is qualitative. The Secondary data collection includes the published white papers, thesis on environment sustainability and other sources

RESEARCH FINDINGS:

The ecosystem's services are crucial to the existence of the human species. The effectiveness and caliber of data collecting will increase if digital solutions are created and implemented in a scalable and adaptable manner. It will enable local and global populations to participate in conservation initiatives and influence choices in real time.

Satellites, mobile devices, artificial intelligence, the Internet of Things, and other modern digital technologies are still in the development phase. Nevertheless, artificial intelligence is being used in many different industries. It is used in bitcoin robots to help traders find the suitable trading signals [4].

The past ten years have demonstrated how these contemporary technologies can aid in incremental and revolutionary adjustments to assist counter challenges to natural resources. Here are a few technological techniques that can aid in the preservation and protection of natural resources.

Real-time data collection:

Using networked devices, sensors, machine learning, etc. is one of the effective strategies to reduce poaching [10]. Digital solutions focus on tracking human activity rather than tracking wildlife so that any unauthorized entry can be found and halted through the warnings the rangers receive on their mobile devices.

Encouraging sustainable fishing:

Utilizing Tide Gauge System application as illustrated in Fig. 4, certain mobile apps are being created that use real-time data to provide information about tide, weather, wind speed and direction, position of marine life and fish, etc.

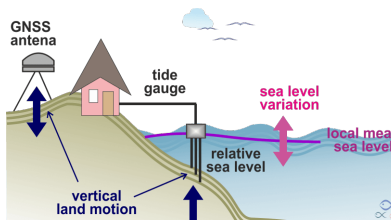


Fig.4 Tide Gauge system

The software gathers and analyses data, looks for unlawful fishing, and follows seafood in supply chains to increase fishing's sustainability. Some apps also include educational content on topics like the dangers of pollution, the preservation of coral reefs, and marine biota.

Mobile big data to defend against air pollution:

Mobile network data is being used by some natural resource conservation projects to combat the harmful health effects of air pollution. Algorithms for machine learning combine anonymous mobile data with weather, pollution, and traffic sensor data.

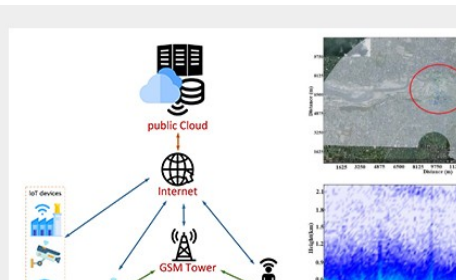


Fig.3 IoT based Air pollution prevention System

Thus, it is possible to forecast and keep an eye on the city's pollution levels. IoT technology is employed in Fig. 3 to mitigate air pollution. The data used in the algorithms will contain both active and passive events. Pollution levels can be predicted up to 24 hours in advance, giving local authorities time to take action to protect human health. This is a more affordable alternative to the standard data collection techniques.

Live streaming to save rainforests:

Modern mobile devices are used by certain initiatives to live stream rainforest sounds and upload them to cloud services. Through these dissonant sounds, AI technology searches for and reports any sounds of unsafe or illegal logging or poaching. The Philippines' forest cover has been demonstrated to benefit from these programs. Many other nations are currently using this model as well. In the upcoming years, the effort is anticipated to conserve several rainforests.

Data-driven mangrove restoration:

An approach to reforestation employed in Malaysia and the Philippines that involve the deployment of connected devices to aid in the restoration of mangroves by coastal communities and nonprofit conservation organizations.

Up to 2,500 square meters of mangroves are monitored by sensors powered by tiny solar panels. This information helps the local community learn which environmental factors are affecting survival rates and how to improve soil and plant conditions.

CONCLUSION:

The simplest way to address the problem of excessive consumption is to simply slow the rate at which resources are exhausted. Less consumption naturally has a negative impact on economies; as a result, India must focus on reducing consumption rates while fostering new businesses that can thrive and ease some of the economic strain, such as renewable energy and recycling technology.

This paper presents the conceptual framework for utilizing technology for sustainability. It serves as a guide to show the way forward when developing and assessing development projects that are focused on the sustainable use of natural resources. All organizations connected with resource use must be given careful consideration, along with their activities and goals, in strategies for sustainable use. In order for all people to be able to protect natural resources and use them responsibly, it is necessary to revamp current political and economic systems.

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