

Peer reviewed Journal

Impact Factor: 7.265

ISSN-2230-9578

Journal of Research and Development

A Multidisciplinary International Level Referred Journal

August 2021 Volume-12 Issue-4

Global Environmental Health and Sustainable Development

Chief Editor
Dr. R. V. Bhole

'Ravichandram' Survey No-101/1, Plot
No-23, Mundada Nagar, Jalgaon

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Dr Suresh S Bakare

Principal Shri Dnyanesh Mahavidyalaya,
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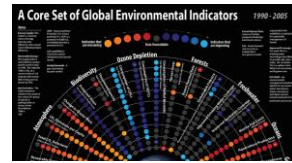
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Mundada Nagar, Jalgaon (M.S.) 425102

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20th August 2021 Volume-12 Issue-4

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Published by- Dr Suresh S Bakare, Principal Shri Dnyanesh Mahavidyalaya, Nawargaon

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Mathematics and Environment

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Abstract:

For improving the quality of life and create an environment in which human beings live in harmony with nature, it is necessary to evaluate the effects of human activities and predict the results under various conditions. Mathematical and statistical models along with computing techniques play essential roles for all these activities. The main purpose of this paper is to be found in the research and education of mathematical and statistical sciences, with an emphasis on their application to environmental problems. Without mathematics nothing you can do. Everything around you is mathematics. Everything around you is numbers. Mathematics is everywhere, operating in real life all around us. So in this paper we see what impact this subject has made on our environment.

Introduction:

Mathematics is one of the most important subject of human life. In every field or profession we use Mathematics. The basics of mathematics start from Primary school but its usage continues till we become adults and hence we can say that mathematics has become an integral part. Without Mathematics our lives is like a ship without a sail. So we cannot imagine our life without Mathematics. We use mathematics every day even without knowing anything about Mathematics. From dialing numbers on phone to giving money for making the payments, our whole world is surrounded by mathematics. Snails make their shells, spiders design their webs, and bee builds hexagonal combs in this way mathematics makes our environment beautiful. We know that Mathematics is important for everyone because Mathematics is a way to improve thinking as problem solving, Mathematics is a way of knowing, Mathematics is a way to improve creative medium, Mathematics is applications. Mathematics plays vital role in our life. Mathematics is the universal language of our environment, which helps human to explain and create. It is important for all of us to be aware of national and global environmental issues, have the knowledge to analyze them and their effects, and consider ways to improve them. We can do that by viewing and analyzing environmental issues through a Math lens, graphing, data collection, numerical calculations, statistics, and lots of more.

Relationship between Mathematics and Environment:

Pollution, Climate Change, Water, Deforestation, Natural Disasters, Garbage, Oil and Energy these are the environmental issue related to Mathematics. In recent years, applied mathematics plays an vital role to do research and estimate mathematical models and statistical models for environmental problems. Now discrete optimization and combinatorics, mathematical modeling with algebras, topology and various equations and also linear and nonlinear programming and stochastic algorithm, provide effective theory for solving problems of environmental pollution and destruction of ecological systems. To solve our environmental problems we use mathematics. So by using mathematical models we can solve our environmental problem which cover a broad area including ecological systems, weather and ocean, it is effective to quantitize and analyze these systems. Hence mathematical models have great importance for development of the technique to construct, apply and estimate. Mathematics brings solid science to the debate. Mathematics problems involving basic computations, percents, ratios, tables, circle charts and graphs are wont to illustrate environmental issues like increase , wastefulness, resource scarcity, air and pollution , and electrical energy demand. Mathematics makes hidden patterns that help us understand the planet around us. Apart from arithmetic and geometry, today mathematics may have diverse discipline that deals with data, measurements, and observations from science; with inference, deduction, and proof; and with mathematical models of natural phenomena, of human behavior, and of social systems. We know that there are many papers related to environment problems with real life. Mathematics or mathematical methods can be used to quantify environmental impacts of activities or products. In this situation, anyone can claim their product is "green" just to suit the standards . When a bunch of choices is served on the table, how do one decide? If the merchandise or service with the simplest environmental performance is in one's best interest, the necessity to understand of how "green" the merchandise is, is important. This is where math comes in i.e.: method of foot printing. By having the "greenness" of the merchandise or service assessed and quantified, customers are going to be ready to compare, evaluate and choose on which product within the market matches their requirement Mathematics provides a number of ways to describe relationships among elements of the environment, such as the weather, the flow of water and nutrients in streams, the volume of water in a flood, behavior of wind and water currents in the atmosphere, and

calculating a water balance between downward flows or rain, surface flows (runoff, soil penetration), and upward flows (evaporation from water bodies, transpiration from biomass). Mathematics can be used to describe the difference between current conditions and historical conditions, such as droughts and floods. Mathematics are really part of the foundations for all the natural sciences, including chemistry (mass balances and interactions of elements and molecules), physics (fundamental relationships between particles, forces and motion), thermodynamics, and electromagnetic, which incorporates properties and behavior of light, radio waves, and other wave-based phenomena. Possibly the hardest aspects of natural science to model with maths are biology and ecosystems, because of their complexity. Also another way of approaching mathematics relation to the environment is in the area of Geographic Information Systems (GIS). These computational tools can solve for spatial relationships such as intersection, containment, adjacency (geometric math), useful for computing and applying spatial, statistical, topological, and other measures to movements of animals, people, and business. The mathematics in GIS allow you, for example, to determine that natural corridors for wildlife trying to move from one end of Florida to another are reduced to less than a quarter mile in places. One can study the effects of, say, edges of urban areas on populations and behavior of birds and other wildlife.

Use of Mathematics in the Environment:

Mathematics are used to describe and estimate complex interactions among components of the natural environment. These are often called models. A simple model may be a thermometer: some colored liquid rises and drops within a really narrow glass tube supported temperature. The thermometer isn't "the temperature" but rather an in depth estimate of the temperature supported physics and thermodynamics. Complex models for various aspects of the environment are described with computer programs.

1. To design of pollution structures that is design of STP, ETP, SWD.
2. To design of pollution control equipment or device
3. To the design of pollution monitoring equipment
4. To design of evaluating process design.
5. To prediction and evaluation of environment impact or assessment.

Need of Mathematics for Environment:

As there are many environmental and social issues occurring around the world. By making cross-curricular connections between Mathematics and environmental education, we can solidify understanding of environmental challenges and build their capacity and willingness to take action. We can teach environmental issue through Mathematics. All of us gain a deeper understanding of the topics through a Mathematical framework, Appreciation of how different subjects connect in real-life contexts, Gain ability to take different perspectives on an issue, Develop realistic and mathematically sound solutions to address issues, Increased levels of student engagement. So there is need of Mathematics for environmental education and environmental protection.

Conclusion:

Mathematics play vital role in solving environmental issue. In this paper we observe that there is very close relationship between Mathematics and Environment. We can solve environmental problems by using Mathematical model. There are many importance of mathematics in environment. Finally we conclude that there is need of Mathematics for environmental education and environmental protection.

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