

# The sustainability through Mathematics: A Necessary Interdependency

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## ABSTRACT:

Guarantying a sustainable future for our children is truly the greatest challenge facing humanity and raises a profusion of scientific and mathematical challenges. In the language of the Brundtland Report, World Commission on Environment and Development, 1987, it means leaving for future generations the same options we have for how we want to live our lives. However, operational that concept is easier said than done

Here, Mathematical modelling is considered as an indispensable tool for sustainable development. Sustainable development is to balance our economic, environmental and social needs allowing prosperity for now and future generations. Mathematical Science plays as tackle the challenges facing our planet. Mathematical modelling plays useful roles towards sustainable development in arriving the understanding, prediction and control of development process. Mathematical modelling can be a powerful tool for understanding and observed phenomena which cannot be understood by verbal reasoning alone. It is conclude that for sustainable development, it is necessary to build mathematical model.

**Keywords:** Mathematical Modelling; Sustainable Development; Real life

## INTRODUCTION:

Sustainable development is development that meets the needs of the present, without compromising the ability of future generations to meet their own needs. Mathematical modeling plays useful roles towards sustainable development in arriving the understanding, prediction and control of development process. Education for sustainable development (ESD) promotes the development of the knowledge, skills, understanding, values and actions required to create a sustainable world, which ensures environmental protection and conservation, promotes social equity and encourages economic sustainability.

Mathematics not only helps us to understand natural phenomena, it also allows us to sustain the majority of human activity on the planet. ... A planet at risk, covering climate change, sustainable development, epidemics; invasive species and natural disasters.

### **NEED FOR SUSTAINABLE DEVELOPMENT**

The idea of sustainable development is essential to address the following issues:

- 1) Prevent the environmental degradation.
- 2) to ensure a human life
- 3) to check the exploitative technology and find alternative sources
- 4) to check the cover exploitation and wastage of natural resources
- 5) to regenerate renewable energy resources etc.

### **HOW MATHEMATICAL MODELING IS RELATED TO SUSTAINABLE DEVELOPMENT**

Biodiversity, climate change, water resources, hazardous waste, nuclear waste, population dynamics etc is the some global sustainable development problem .these problem are describe by mathematical model. The sustainability of planet Earth depends on mathematical science. Every phenomenon on earth is subject to mathematics, which is the only language we can use to describe them. Moreover, mankind must factor mathematics into any approaches it takes to addressing said challenges. Climate change, protecting biodiversity, tackling pollution, controlling epidemics, and ocean sustainability, natural disaster (volcanoes, earthquakes and tsunamis) are all subject to linear and nonlinear differential equation. Earth interior mantle, terrestrial crust, atmosphere and the life that it sustains are all subject to dynamics process. Mathematical model sustain the majority of human activity on the planet. Mathematical model are used to solve many real life situations like:

- 1) Mathematical modelling of launching a satellite.
- 2) Mathematical modelling of urban city planning.
- 3) Mathematical modelling of controlling pollution due to vehicles.
- 4) Mathematical modelling of the traffic flow on highways or the stock market options.
- 5) Mathematical models to understand the working of heart, brain, lungs, kidneys, and the endocrine system.
- 6) Mathematical models to demonstrate the action of medicine in the human system.

- 8) Mathematical models for global warming.
- 9) Mathematical models to understand the fluid flow in drains ,lakes, rivers, spillways, and so on Mathematical model are recognized as effective tool that could help examine economic, environmental and ecological impacts of alternative pollution control and resources-conservation actions, and thus aid planners or decision –makers in formulating cost –effective management policies.

### **CONCLUSION:**

The problems of achieving sustainability are urgent and huge and will require complementary inputs of diverse disciplines. Hence mathematics has a great deal to contribute in addressing these problems, but it is equally certain, as has always been the case, that new mathematics will be stimulated by the energy and freshness that comes from new applications and new challenges. The discipline of mathematics has much to contribute, and much to gain, from engagement in future.

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