ENVIRONMENTAL ANALYSIS: ITS NEED, METHOD AND VALIDATION IN THE CONTEMPORARY SOCIETY

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ABSTRACT

Environmental Analysis is an interdisciplinary process focusing on the interaction between human and non-human components of the biosphere. The subject applies approaches mainly in the natural sciences to understanding and solving environmental problems. Environmental Analysis offers an integrated and unifying perspective on life, as well as a program for affecting a positive change. The process prepares people for work towards environment. And impart knowledge for careers in teaching, public policy and administration, law, environmental sciences, international affairs, environmental design, and the also non-profit sector. Developing sustainable ways of living is one of the greatest challenges of the global people. The Environmental Analysis Program provides robust interdisciplinary training for students interested in environmental issues. The Environmental Analysis Program regards study abroad as a valuable, though not required, part of the curriculum, enabling students to secure deeper appreciation of the global dimensions of environmental challenges. Additionally, the Environmental Analysis Programme encourages students to engage in internships and fieldwork that move them beyond the classroom and library to engage in research and action.

Key Words *:- Environmental Analysis, Environmental design, Sustainable development, Interdisciplinary, Environmental challenges*

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Introduction

Environmental Analysis is a systematic, interdisciplinary process used to identify the purpose of a proposed action, develop practical alternatives to it, and predict potential environmental effects of the action. A few examples of proposed actions are road construction, logging, and afforestation, making a hydroelectric project, or developing a quarry. Environmental Analysis may be defined as the evaluation of natural environment and of damage to it through human and non-human agencies. Thus, Environmental Analysis involves efficient monitoring of the general environment. This is essential because by this one becomes sure what control measures are required and whether those are in operation have been working. Thus, if one is able to develop a thorough understanding of structural and functional attributes of the environment by involving environmental analysis, one can avoid the impending ecological catastrophes.

Need of Environmental Analysis:-

In the contemporary Society, ecological research is not only confined to mere qualitative approach, but is more confined to quantitative approach. In order to have a comprehensive evaluation of an ecosystem, it becomes essential to monitor both qualitatively and quantitatively spatial and temporal variations in structural and functional attributes of environment which may be categorized as physical, chemical and biological. The biosphere is defined as the layer of soil, water and air that surrounds the planet. Biosphere provides support to the Earth along with the living organisms.

Method of doing Environmental Analysis:-

The actual task of selecting appropriate measuring procedures is a massive one and should involve large numbers of experienced scientists working in conjunction with other professions. Whenever a scientist selects a method for carrying out environmental analysis, he must be able to answer the following questions –

a. Was the sample truly representative?
b. Were duplicate samples forwarded to a second independent laboratory for quantitative study?

c. What are the limits of depletion, accuracy, degree of reliability, etc. of the analytic procedure used?
d. Who undertook the analysis, a semi-skilled operator, a qualified technician, or a professional chemist?
e. What precautions were taken to avoid contamination of the sample during handling?
f. Does the mode of reporting reflect the real toxic situation? In other words, does the health hazard depend on the amount of a particular element present or on the existence of a particular chemical form?

Validity of data in Environmental Analysis: - The Validity of data in environmental analysis can be categorized under the following heads-

1. Analytical problem-In spite of the intense efforts undertaken in recent years, our knowledge of the modes of distribution of elements within the biosphere and lithosphere has been still in a comparatively primitive state. There exists a paucity of information on the nature of the most significant chemical forms, and it becomes frequently difficult to accept the validity of published numbers due to poor control of some, most or all aspects of the analytical process.

It becomes possible to sub-divide the challenges associated with developing procedures for valid monitoring of polluted systems into four major categories-

a. Development of techniques which are sufficiently sensitive, i.e. allow accurate evaluation of components present at part per billion levels.

b. Evaluation of errors which are associated with sample collection, storage and preparation for testing.

c. Definition of type of chemical analysis required.

d. Designation of the role of competing equilibrium.

There occur major advances in the areas of new techniques, but the significance of the other facts has been only currently being appreciated.

2. Selection of marker species:-

One main difficulty facing all investigators has been the clear definition of the type of data required. Is the determination of the elemental composition sufficient, or should one be ascertaining the amount of some particular molecular species or functional group?

Analysis for the total amount of some given element (eg. Mercury, Lead and Phosphorus) can give an incomplete or erroneous measure of potential health hazards. Consider the relationship between the total metal content of solids and uptake by plants.

Only a fraction of the total soil metal content has been available to plants, and the investigator's problem has been to devise chemical means of reproducing the activity of plant root systems. Often success has been minimal. In the case of lettuce plants, the amount of lead found in the plant can get related to the amount of lead extracted from the surrounding soil by molar nitric acid. With oats, lead uptake gets correlated better with the amount of lead extracted by a milder treatment (eg., 0.01 M nitric acid or molar ammonium acetate). The application of copper sulphate, either to soil or as a foliar spray, tends to increase the copper content of wheat plants, but in this case the plant metal uptake does not appear to correlate with the amount of available copper as determined by extraction with either strong acid, or molar ammonium acetate, or strong complexing agent (EDTA).

When foliar sprays have been involved, one would expect some variation due to direct absorption of metal ions by the exposed leaf surfaces. A similar mechanism appears to apply in the accumulation of lead by plant matter growing near motor-ways.

It has been tempting to take the argument to an extreme and suggest that monitoring of soil or atmosphere levels is having little value if one gets concerned primarily with potential dangers associated with the incorporation of toxic materials into the food chain.

However, despite the obvious limitations, monitoring of single phases will continue, as such studies facilitate the identification of zones of contamination; allow recording of intermittent changes in levels; and supply guidance in respect to the role of external factors such as wind direction, rainfall, topography, etc.

For the recording of trends, several marker systems could prove to be equally appropriate, provided one does not try to place undue emphasis on the relative magnitude of the numbers obtained.

Conclusion

In recent years, environmental analysis is not only confined to mere qualitative approach but is more confined to quantitative approach. In order to have a comprehensive evaluation of environmental analysis, it becomes essential to monitor both qualitatively and quantitatively spatial and temporal variations in structural attributes of environment which may be categorized as physical, chemical and biological. Sampling is also needed for environmental analysis. In the ideal situation, the result obtained from the small laboratory sample must be identical with that obtained by collectively examining the whole mass of material. Regarding air pollution, Carbon containing aerosol is the most abundant particulate air pollutant species. It causes poor visibility and can be toxic. Tracing its origins is an important step in environmental management and control.

Environmental Process Analysis takes a unique approach, applying mathematical and numerical process modeling within the context of both natural and engineered environmental systems. Readers master core principles of natural and engineering science such as chemical equilibrium, reaction kinetics, ideal and non-ideal reactor theory, and mass accounting by performing practical real-world analyses. As they progress through the text, readers will have the opportunity to analyze a broad range of environmental processes and systems, including water and wastewater treatment, surface mining, agriculture, landfills, subsurface saturated and unsaturated porous media, aqueous and marine sediments, surface waters, and atmospheric moisture.

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