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Generating Global
Environmental Benefits - GEB

REVIEW INDICATORS FOR ESTABLISHING ENVIRONMENTAL INFORMATION MANAGEMENT SYSTEM (EIMS)

A study carried out by GEB project that briefly reviewed the three conventions (UNCBD, UNCCD, UNFCCC) as well as analysed the environmental indicators reported against each convention

GEB - A Joint Initiative of United Nations Development Programme (UNDP) & Ministry of Climate Change (MoCC)

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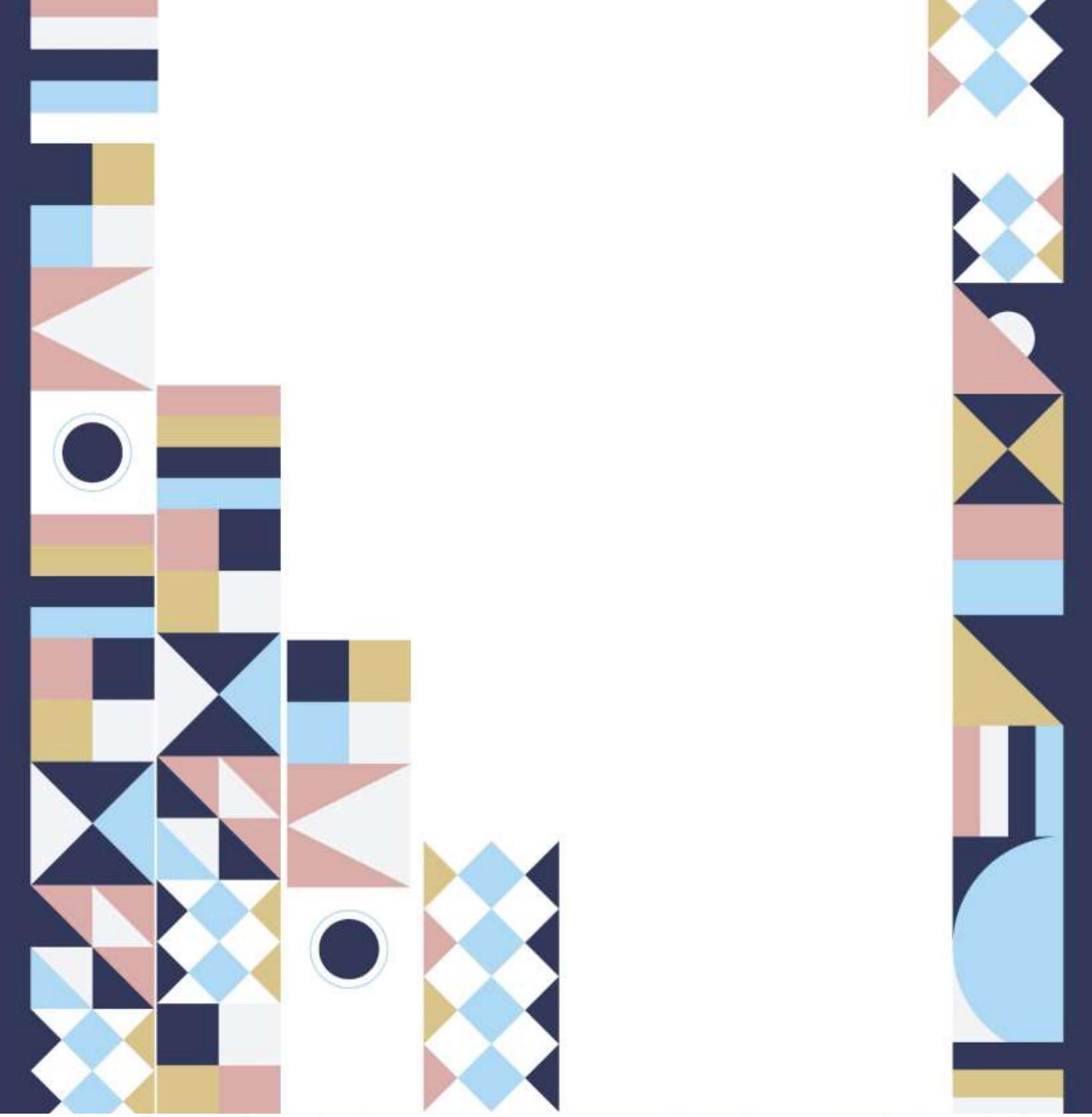

Table of Contents

1. BACKGROUND

1.1. OVERVIEW

Generating Global Environmental Benefits (GEB) project funded by the UNDP/GEF and being implemented by the Ministry of Climate Change aims to remove the barriers to environmental information management and mainstream global environment concerns into economic decision-making. The Project Management Unit (PMU) of GEB project is established in Islamabad.

The objective of the GEB project is two-fold in its focus; one related to environmental information, and the other to employ this information for improved decision-making. Moreover, the said project has three inter-related outcomes: regular availability of consistent and reliable environmental data; a coordinated and robust environmental information management system; and enhanced commitment and capacity for sustainable development planning and legislation.

1.2. OBJECTIVES OF GEB

Objectives of the GEB Project are as under:

- The project is related to environmental information; and
- To employ the information for improved decision-making.

1.3. AIM OF GEB

Aims of GEB are given in following:

- To remove barriers to EIMS; and
- To mainstream global environment concerns into economic decision making.

2. METHODOLOGY

2.1. METHODOLOGY

Comprehensive methodology was formulated as under:

2.1.1. Collection of Data / Information

- Data/Information was obtained through desk work, review of available reports & literature and meetings with stakeholders; and
- National and Provincial departments & agencies were contacted for seeking their respective input on Environmental Information Management System (EIMS).

2.1.2. Data Synthesis and Comparison

The raw collected data / information is computerized, analyzed and integrated for further studies.

3. REVIEW OF ENVIRONMENTAL INDICATORS

3.1. ENVIRONMENTAL INDICATORS

An environmental indicator provides useful information to the stakeholders regarding environmental status. NEC consultants, 2008 submitted a report to Government of Pakistan on National Environmentally Sustainable Indicators. In this report 92 indicators had been suggested.

3.2. DEVELOPMENT OF INDICATORS

Environmental indicators are required to be developed as under for subsequent adoption of EIMS in Pakistan:

- Development and use of a core or critical data-set and indicators for use in the above documents; and
- Use of indicators, assessment methodologies and tools to enhance capacities at the national and provincial/regional level arid where necessary at the local level.

3.3. DESK REVIEW

Desk review was done as under:

- Government of Pakistan, National Environmental Quality Standards, 2002.
- Government of Pakistan, Pakistan Environmental Protection Act, 1997.
- Government of Pakistan, Pakistan Environmental Protection Agency, (1997), Pakistan Environmental Assessment Procedures.
- Government of Pakistan and IUCN, 1992, Pakistan National Conservation Strategy.
- Government of Pakistan, Pakistan Environmental Protection Agency, Review of Initial Environmental Examination and Environmental Impact Assessment Regulations, 2000 (Appendix II).
- Government of Pakistan (2005), Compendium of Environmental Statistics of Pakistan, Bureau of Statistics, Islamabad
- NEC Consultant (2008), National Environmentally Sustainable Development Indicators Study, Lahore
- Pak EPA, Review of IEE and EIA Regulations, 2000.

4. REVIEW OF CONVENTIONS

4.1. UNITED NATIONS CONVENTION ON BIOLOGICAL DIVERSITY (UNCBD)

The **Convention on Biological Diversity** (**CBD**), known informally as the **Biodiversity Convention**, is a multilateral treaty. The Convention has three main goals including: the conservation of biological diversity (or biodiversity); the sustainable use of its components; and the fair and equitable sharing of benefits arising from genetic resources.

In other words, its objective is to develop national strategies for the conservation and sustainable use of biological diversity. It is often seen as the key document regarding sustainable development. The Convention was opened for signature at the Earth Summit in Rio de Janeiro on 5 June 1992 and entered into force on 29 December 1993. CBD has two supplementary agreements - Cartagena Protocol and Nagoya Protocol.

4.2. UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC)

The UNFCCC entered into force on 21 March 1994. Today, it has near-universal membership. The 197 countries that have ratified the Convention are called Parties to the Convention. The UNFCCC is a "Rio Convention", one of three adopted at the "Rio Earth Summit" in 1992. Its sister Rio Conventions are the UN Convention on Biological Diversity and the Convention to Combat Desertification. The three are intrinsically linked. It is in this context that the Joint Liaison Group was set up to boost cooperation among the three Conventions, with the ultimate aim of developing synergies in their activities on issues of mutual concern. It now also incorporates the Ramsar Convention on Wetlands. Preventing danger

4.3. UNITED NATIONS CONVENTION TO COMBAT DESERTIFICATION (UNCCD)

Established in 1994, the United Nations Convention to Combat Desertification (UNCCD) is the sole legally binding international agreement linking environment and development to sustainable land management. The Convention addresses specifically the arid, semi-arid and dry sub-humid areas, known as the drylands, where some of the most vulnerable ecosystems and peoples can be found.

The new UNCCD 2018-2030 Strategic Framework is the most comprehensive global commitment to achieve Land Degradation Neutrality (LDN) in order to restore the productivity of vast expanses of degraded land, improve the livelihoods of more than 1.3 billion people, and reduce the impacts of drought on vulnerable populations to build
A future that avoids, minimizes, and reverses desertification/land degradation and mitigates the effects of drought in affected areas at all levels to achieve a land degradation-neutral world consistent with the 2030 Agenda for Sustainable Development.

The Convention's 197 parties work together to improve the living conditions for people in drylands, to maintain and restore land and soil productivity, and to mitigate the effects of drought. The UNCCD is particularly committed to a bottom-up approach, encouraging the participation of local people in combating desertification and land degradation. The UNCCD secretariat facilitates cooperation between

developed and developing countries, particularly around knowledge and technology transfer for sustainable land management.

As the dynamics of land, climate and biodiversity are intimately connected, the UNCCD collaborates closely with the other two Rio Conventions; the Convention on Biological Diversity (CBD) and the United Nations Framework Convention on Climate Change (UNFCCC), to meet these complex challenges with an integrated approach and the best possible use of natural resources.

4.4. REVIEW THE REPORTS SUBMITTED / OBLIGATED TO BE SUBMITTED BY PAKISTAN

Pakistan is a signatory to all above-mentioned UN conventions. In all three cases Pakistan is widely affected. Biodiversity in Pakistan is seriously impacted by environmental degradation. The country is facing adverse effects of current climate change. Further 76% area of Pakistan is affected by desertification.

In the said backdrop Pakistan needs to analyze the ongoing environmental destruction and adopt an effective policy with the establishment of EIMS. This will help in understanding, analyzing and mitigating the said damages. Different environmental indicators are analyzed for establishing Environmental Information Management System (EIMS) in the later part of this report. Existing gaps are noted and best practices are suggested for incorporation.

5. ENVIRONMENTAL INDICATORS AND VARIABLES

5.1. GENERAL

5.1.1. Ecosystem Services

The processes by which life-supporting resources such as clean water, timber, fisheries, and agricultural crops are produced.

5.1.2. Environmental indicator

It is an indicator that describes the current state of an environmental system.

5.1.3. Global Environmental Indicators

The five key global environmental indicators are:

- Biological diversity
- Food production
- Average global surface temperature and CO_2 concentrations in the atmosphere
- Human population
- Resource depletion

5.2. UNITED NATIONS CONVENTION ON BIOLOGICAL DIVERSITY (UNCBD)

5.2.1. Indicators

- Population of Terrestrial Species
- Population of Aquatic Species
- Population of Marine Species
- Species extinction rates
  - Global
  - Pakistan
- Threatened species
  - Global
  - Pakistan
- Wildlife
- Migratory birds

5.2.2. Variables

Each environmental indicator has certain variables. Environmental indicator is judged by the quality and quantity of variables. The variables may change from place to place and from time to time. The above given indicators should be studied in detail with respect to the given variables.

5.3. UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC)

5.3.1. Indicators

Some indicators are mentioned below:

- Ozone Depletion
- GHG Emissions
- Earth's temperature
- Air pollution
- Incidence of floods
- Incidence of droughts
- Excessive rains
- Scant rains
- Low food production
- Changing crop patterns
- Sea water rise
- Impacts on livestock and animals

5.3.2. Variables

Each environmental indicator has certain variables. Environmental indicator it is judged by the quality and quantity of variables. The variables may change from place to place and from time to time. The above given indicators will be studied in detail with respect to the given variables.

5.4. UNITED NATIONS CONVENTION TO COMBAT DESERTIFICATION (UNCCD)

5.4.1. Indicators

A few indicators are given below:

- Ecological footprint (land use and CO2 emissions)
- land use change
- Wetland surface change
- land degradation: Net Primary production and rain use efficiency
- Increased water erosion
- Increased air erosion
- Loss of top fertile soil
- Inundation
- Salinity

5.4.2. Variables

Each environmental indicator has certain variables. Environmental indicator is judged by the quality and quantity of variables. The variables may change from place to place and from time to time. The above given indicators should be studied in detail with respect to the given variables.

6. ESTABLISHING ENVIRONMENTAL INFORMATION MANAGEMENT SYSTEM (EIMS)

6.1. DEFINITIONS

For proper understanding of EIMS a few terms are given below:

- ***Environmental Information and Environmental Information Systems*** play a major role in environmental decision making. This working paper is a review of the historical development and state-of-the-art of environmental information systems. It focuses on the creation, management and use of Environmental Information Systems (EISs) Muki Haklay, 1999.

- ***EIMS*** are a collection of contemporary technologies collectively used to allow a user to store, query, visualize and analyze historic and real time environment data.

6.2. ENVIRONMENTAL INFORMATICS

It is a field of applied computer science that develops and uses the techniques of information processing for environmental protection, research, and engineering basic methodological issues and typical application system GIS, modeling software, environmental management systems, knowledge-based systems, and the visualization of complex environmental data. A sampling of topics: networking protocols and tools for the environmental science community, and adaptable architecture for river quality monitoring, and CRAMD a database for validation of models used in chemical risk assessment (Avouris and Page, 1995).

6.3. BENEFITS OF EIMS

EIMS provides a complete, largely automatic, fully integrated, state-of-the-art ICT solution for the environmental management: planning, assessment, compliance monitoring and impact assessment as well as emergency management for industrial enterprises or groups of co-located enterprises in industrial parks.

6.4. ESTABLISHING ENVIRONMENTAL INFORMATION MANAGEMENT SYSTEM (EIMS)

EIMS is the prerequisite for sustainable development of projects. Without incorporation of EIMS proper planning and execution of the project cannot be done. Therefore, EIMS must be established at national and provincial levels.

Thus, there is need of enlisting indicators and their prioritization at national level and conduction of detailed research on the topic.

7. REFERENCES

- Government of Pakistan, National Environmental Quality Standards, 2002.
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