

IEA

Training Manual

*A training manual on
integrated environmental
assessment and reporting*

Training Module 4

*Monitoring, data
and indicators*

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Table of Contents

List of Acronyms	iv
Overview	1
Course Materials	3
1. Introduction and learning objectives	3
2. Developing data for integrated environmental assessment	3
2.1 Importance of process	6
3. Information systems	9
3.1 Data	9
3.1.1 Types of data	9
3.1.2 Qualitative data	9
3.1.3 Quantitative data	11
3.2 Monitoring and data collection of environmental trends and conditions	17
3.3 Data compilation	19
3.4 GEO Data Portal	21
4. Indicators and indices	26
4.1 Indicators	26
4.2 Indices	38
5. Data analysis	45
5.1 Non-spatial analysis	45
5.2 Spatial analysis	49
References	56
Appendix A: Continuation of GEO Core Indicator Matrix	59
Instructor Guidance and Training Plan	64
Presentation Materials	65

List of Acronyms

AFEAS	Alternative Fluorocarbons Environmental Acceptability Study
AQI	Air Quality Index
ASTER	Advanced Spaceborne Thermal Emission and Reflection Radiometer
BOD	Biological Oxygen Demand
CDIAC	Carbon Dioxide Information Analysis Center
CEDARE	Centre for Environment and Development for Arab Region and Europe
CEOS	Committee on Earth Observation Satellites
CFC	Chlorofluorocarbon
CIDCM SFTF	Center for International Development and Conflict Management (CIDCM) State Failure Task Force (SFTF)
CIESIN ENTRI	Center for International Earth Science Information Network – Environmental Treaties and Resource Indicators
CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna
CLRTAP	Convention on Long-range Transboundary Air Pollution
CRED	Center for Research on the Epidemiology of Disasters
CRU	Climate Research Unit, School of Environmental Sciences, United Kingdom
DALYs	Disability-Adjusted Life Years
DEIA	Division of Environmental Information and Assessment
DO	Dissolved Oxygen
DPSIR	Drivers – Pressure – State – Impacts – Responses
DSR	Driving – State – Response
EC-JRC	European Commission Joint Research Centre
EDGAR	Electronic Data Gathering, Analysis, and Retrieval system, USGS
EEA	European Environmental Agency
EEZ	Exclusive Economic Zone
EIONET	European Environment and Observation Network
UN EIP	UN Economic Impact of Peacekeeping
EM-DAT	Emergency Disasters Data Base, OFDA and CRED
ERS	European Remote Sensing Satellites
FAO	Food and Agriculture Organization of the United Nations
FRA	Global Forest Resources Assessment, FAO
G3OS	The Three Global Observing Systems (GCOS, GOOS, GTOS)
GCOS	Global Climate Observing System
GDP	Gross Domestic Product
GEIA	Global Emissions Inventory Activity
GEM	Gender Empowerment Measure
GEMS-Water	Global Environment Monitoring Systems – Water
GEMStat	Global Environmental Monitoring Systems – Global Water Quality Database

GEO	Global Environment Outlook
GEO DWG	GEO Data Working Group
GEOSS	Global Earth Observation System of Systems
GDI	Gender-related Development Index
GGIS	Global Groundwater Information System
GIS	Global Information System
GLASOD	Global Assessment of Human Induced Soil Degradation
GMET	General Multilingual Environmental Thesaurus
GNP	Gross National Product
GOOS	Global Ocean Observing System
GRDC	Global Runoff Data Centre
GTOS	Global Terrestrial Observing System
HCFC	Hydrochlorofluorocarbon
HDI	Human Development Index
HPI	Human Poverty Index
ICLARM	International Center for Living Aquatic Resources Management
IEA	Integrated Environmental Assessment
IFA	International Fertilizer Industry Association
IGBP	International Geosphere-Biosphere Programme
IGOS	Integrated Global Observing Strategy
IGRAC	International Groundwater Resources Assessment Centre
ILAC	Latin America and Caribbean Initiative for Sustainable Development
ILO	International Labour Organization
IMO	International Maritime Organization
IMS	Institute of Mathematical Sciences
IISD	International Institute for Sustainable Development
IPCC	Intergovernmental Panel on Climate Change
IRS	Indian Remote Sensing Satellite
ISRIC	International Soil and Reference Information Centre
IUCN	International Union for the Conservation of Nature and Natural Resources – the World Conservation Union
LME	Large Marine Ecosystem
MA	Millennium Ecosystem Assessment
MEA	Multilateral Environmental Agreement
NAFTA	North American Free Trade Agreement
NOAA	National Atmospheric and Oceanic Administration
NO_x	Nitrogen Oxides
ODA	Official Development Assistance and Aid
OECD	Organisation for Economic Co-operation and Development
OFDA	Office of US Foreign Disaster Assistance

PCB	Polychlorinated Biphenyl
PM	Particulate Matter
PPP	Purchasing Power Parity
RCMRD	Regional Center for Mapping of Resources for Development
RIVM	Rijksinstituut voor Volksgezondheid en Milieu (National Institute for Public Health and the Environment, Netherlands)
RS	Remote Sensing
SEEA	System of Integrated Environmental and Economic Accounting
SoE	State of the Environment
SOFO	State of the World's Forests
SO₂	Sulphur dioxide
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UBC	University of British Columbia
UN COMTRADE	United Nations Commodity Trade Statistics Database
UN CSD	UN Commission on Sustainable Development
UN DSD	UN Division for Sustainable Development
UN MDG	UN Millennium Development Goals
UNDP	UN Development Programme
UNEP	UN Environment Programme
UNEP/GRID	UNEP Global Resource Information Database
UNEP GPA	UNEP Global Programme of Action
UNEP RRC.AP	UNEP Regional Resource Centre for Asia and the Pacific
UNESCO	UN Educational, Scientific and Cultural Organization
UNFCCC	UN Framework Convention on Climate Change
UNH	University of New Hampshire
UN-ISDR	UN International Strategy for Disaster Reduction
UN-OCHA	UN Office for the Coordination of Humanitarian Affairs
UNOOSA	UN Office for Outer Space Affairs
UNSD	UN Statistics Division
USGS	United States Geological Survey
USGS EDC	USGS Earth Resources Observation Systems (EROS) Data Center (EDC)
USGS GLCC	USGS Global Land Cover Characterization
UV-B	Ultraviolet radiation-B
WCMC	World Conservation Monitoring Centre
WHO	World Health Organization

Overview

A steady increase in reporting on environmental trends and performance during the past decade reflects a broad societal need for strengthening the evidence base for policymaking. We also see a growth in systems for collecting and analysing data about the environment and human well-being at local, national, sub-regional, regional and global levels. Interest in fine tuning monitoring and data collection systems to reflect the real needs of society and decision-makers is now part of the mainstream.

At some point during the process of developing your integrated environmental assessment (IEA), you will need to collect, process and analyze data. As you begin, you will need to know essentials about data collection including selecting the most appropriate and reliable types and sources of data and how to collect, store and analyze your data. This module addresses these issues, with particular focus on statistics and spatial data collection, analysis and the use of tools such as the GEO Data Portal and regional data portals to support IEA.

With data in hand, the next step will be to convert the data into a meaningful form that can be used during decision making processes. Indicators and indices help us package data into a form that speaks to a relevant policy issue. You will learn the basic building blocks of indicators and indices, including frameworks, selection criteria, and elements of a participatory indicator selection process. The module outlines these elements, and includes examples of indicators, including the GEO core indicator set.

Once you have developed indicators, you will need to derive meaning from them. What trends, correlations, or spatial relationships are revealed through the data? To answer these questions, you will need familiarity with various non-spatial and spatial analysis techniques.

A common theme running through this module is the importance of participatory processes. Understanding which stakeholders and experts need to be involved in the process, and when and how is essential because what we choose to measure reflects our values. A participatory process also provides an opportunity for change, as society seeks to improve what gets measured.

A second theme is the importance of reliable data and well-chosen indicators. This is critical to the process, because poor information can lead to poor decisions. At the same time, information needs to speak to the intended audience in a relevant way; otherwise, the most well-developed indicators could have limited impact.

Through a series of presentations, examples and exercises, this module will provide you with a number of tools and techniques necessary to complete the data collection and indicator development aspects for an IEA.

