

**FACULTY UPGRADATION PROGRAM IN
ENVIRONMENTAL ECONOMICS**

October 11 – November 5, 1999

Program Directors

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Overview

**Indira Gandhi Institute of Development Research
General A.K.Vaidya Marg
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Preface

Several Indian Universities are in the process of introducing Environmental Economics in their curriculum. In order to facilitate this process, the World Bank aided “Environmental Management Capacity Building” (EMCaB) project is undertaking several faculty upgradation programmes. The present, one of its kind, is the outcome of the initiatives taken by Prof.U.Sankar, Director, Madras School of Economics (MSE), the national coordinator of the EMCaB project and Prof.Jyoti K.Parikh, Chairperson, Environmental Economics Research Committee of the project.

This faculty up-gradation program in Environmental Economics is intended primarily for the university teachers and researchers; but it could also help policy makers involved in environment related decisions in government and non-government organizations. The overall objective is to enable the teachers, researchers and policy makers to initiative environmental economic studies themselves so as to develop corresponding analytical abilities in the sphere of environmental preservation and sustainable development. Solution to environmental problems require contributions from both natural and social scientists. Environmental studies accordingly involve an interdisciplinary approach. In pursuing this approach, environmental economics provides a central role to human behaviour.

The main objective of this program is thus to help the participants to understand te interaction between economic and environment systems and the manner in which resource allocation decisions affect the environment. The areas that are covered here includes economic instruments in environmental policy and regulation, alternative approaches to environmental valuation, regulations, institutions, international trade and sectoral issues like air, water and energy. These are brought out in five volumes, viz., (I) Concepts and Issues, (ii) Accounting and Valuation, (iii) Case Studies, (iv) Economic Instruments and Institutions, and (v) Miscellaneous Papers. Obviously, this scheme is for convenience of organizing the materials and does not represent watertight divisions.

The first part of the program is concerned with the basic economic issues and tools such as public goods and externalities, resource economics, econometrics, uncertainty and irreversibility. The second part examines various models and approaches to study the natural resource management and assesses their effectiveness in a variety of case studies. The third section of the program focuses on a variety of issues that constitute environmental economics. These include: energy-environment nexus, poverty and environment interaction, urbanization and sectoral policies related to land, air, water and forest. Participants are provided with a series of case studies based discussions, which are used to explore in some detail the key features of various issues on hand. The fourth part is organized around the three themes: economic instruments, international issues like trade and joint implementation, and green development strategy. Finally, the participants are provided with some miscellaneous but important papers form the literature.

A program of this nature would not have been possible without financial support and cooperation from institutions and inputs from a large number of people. We are particularly grateful to the World Bank and the MSE, Chennai, for financing this program under the EMCaB project. The Ministry of Environment and Forests, Government of India is the implementing agency of this project. We would like to express our personal thanks to Prof. U.Sankar, Director, MSE, for his active support. We are also grateful to Prof.Kirit S.Parikh and Prof.Jyoti K.Parikh of IGIDR for their support and guidance. We thank all the resource persons who have agreed to deliver lectures. We record our appreciation to the participants who have enthusiastically attended in this program from different parts of India.

Last, but not the least, we thank Sir. C.V.Subramaniyan, Ms.Diana George, Mrs.Radha Ramamurthy, Sriuths Ramakrishna, Aravind Jha, Rajashri Pandit, Mahesh Mohan, Sarang, Ms.martha Lobo and a stream of enthusiastic IGIDR personnel for helping us in various ways in making this program a success.

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Course Outline

Introduction: Concepts, Issues and tools

An introduction to Environmental Economics
The economy, environment and ecology interactions
Energy use and economics growth
Economic approach to environmental preservation and conservation
State of the environment

Role of data analysis in econometrics
Time-series analysis

Externalities and economic efficiency, market failure
Externalities as public goods
Efficient level of provision of public good
Internalizing externalities
Taxes, permits and standards as corrective measures
Property rights and externalities
Coase's theorem and its critique
Uncertainty, Market imperfection, No-convexity

Overview of the Natural Resources
A Basic Model of Natural Resources
Natural Resources Stock Effect and the Concept of User Cost
Intertemporal Allocations
Resource Policy
An Illustrative Example (Exhaustible Resources)
Renewable Resources
Static and Dynamic Models of Exploitation (harvesting)
Management of Energy Resources

Valuation methods and approaches

Use values, option values, existence value, and bequest value
Market and non-market benefits
Direct methods
Physical linkage, abatement cost methods
Contingent valuation method (CVM)
Willingness to pay, willingness to accept, problems with CVM, private good market model, referendum
Case studies relating to the valuation of forests, water, air and biodiversity

Natural Resource Management

Need for NRA
Integrated Environmental and Economics Accounting
Integration into the system of national income account, Green NDP
Case studies

Theory of optimal resource extraction: renewable and non-renewable resources
Under different market conditions
Economics of forestry management
Common Property Resources

Energy and Environment

Energy Dynamics
Energy modeling and computable general equilibrium model
Energy conservation and environmental implications
Impact of power consumption on the environment
Case studies
Environmental auditing for industries

Effects of urbanisation on environment
Specificities of urban environmental issues
Case studies

Elements of ecology
Material balance approach
Limits to substitution and irreversibility

Life cycle costing

Environmental Impact Assessment

Appraisal of project with environment Impacts
Environment and social assessment of projects
Developing indicators, which quantify the environment and implications of the project
Economy-wide policies and project appraisal
Monitoring and Evaluation
Financial, economic and social performance of projects
Case studies

Poverty and environment

- Poor and resource degradation
- Rural energy and water and implications on the environment
- Gender issues and environmental movements

Environmental Policies

- Approaches to sustainable development
- Concepts and indicators
- Linkage and trade-offs
- Inter-generational and intra-generational equity
- Alternative models of sustainable development
- Institutions and policies
- Green budgets
- Performance bonds
- Deposit refund system
- Strict liability
- Enforcement issues
- An evaluation of India's current environmental policies

Envt. Law, Regulations and Institutions

- Environmental legislations
- Pigouvian optimum: standards – charges / permits approach
- Envt. legislations
- Design and regulation of mechanism for pollution control
- Setting standards with imperfect enforcement
- Instruments for deterrence from non-compliance

International Issues

- Links between trade and envt.
- Trade and Evt. in the WTO regime
- Pollution haven argument
- Harmonisation of Process and Product Standards
- Climate change: Concept and Impact
- GHG emissions: Sources and sectors
- India's response strategies
- Global negotiations
- Decision making under uncertainty
- Tradable permits
- Carbon taxes
- Global governance
- Eco-labeling
- Joint implementation, Kyoto protocol and CDM
- Tradable permits and the basis for allocation and arrangement for trading

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PROGRAMME OF LECTURES

FIRST WEEK

<i>Date/Day</i>	<i>Session – I 10.00 - 11.15</i>	<i>Session – II 11.45 - 1.00</i>	<i>Session – III 2.00 - 3.15</i>	<i>Session – IV 3.45 – 5.00</i>
11.10.1999 Monday	Inauguration	Envt.Economics:Issues and Concepts Jyoti K.Parikh and Kirit S.Parikh		Library
12.10.1999 Tuesday	Economic Development and Envt. R.Mukherjee		Econometrics M.H.Suryanarayana	Computer
13.10.1999 Wednesday	Public Goods & Externalities Jha		Econometrics M.H.Suryanarayana	Computer
14.10.1999 Thursday	Agriculture and Envt. R.Eckaus	Public Expenditure R.Jha	Econometrics M.H.Suryanarayana	Climate Change
15.10.1999 Friday	Resource Economics V.B.N.S.Madduri		Input-output Models M.Panda	S.D.Models K.Parikh

16.10.1999 Saturday	Tour to Godrej Industries			
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SECOND WEEK

<i>Date/Day</i>	<i>Session – I 10.00 - 11.15</i>	<i>Session – II 11.45 - 1.00</i>	<i>Session – III 2.00 - 3.15</i>	<i>Session – IV 3.45 – 5.00</i>
18.10.1999 Monday	Ecological Economics P.Rambabu	Theory of NRA Kirit S.Parikh	Valuation methods J.Parikh	Case studies M.Panda
19.10.1999 Tuesday	Holiday			
20.10.1999 Wednesday	Game theory applications Ajit Ranade		Irriversability P.G.Babu	Valuation Methods M.N.Murty
21.10.1999 Thursday	Case studies Valuation M.N.Murty	Sectoral Policies and Case studies (Land) Evaluation, Monitoring and Management S.Reddy		
22.10.1999 Friday	Theory of valuation contributions by communities G.Kadekodi	Theory of valuing	Natural Resource Mana CPR NGO experience S.Iyengar	

24.10.1999 Saturday	Tour to Bombay Natural History Society			
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THIRD WEEK

<i>Date/Day</i>	<i>Session – I 10.00 - 11.15</i>	<i>Session – II 11.45 - 1.00</i>	<i>Session – III 2.00 - 3.15</i>	<i>Session – IV 3.45 – 5.00</i>
25.10.1999 Monday	Political Economy and Env't. K.Parikh	Forestry Madhau Verma	Water Management	Sectoral policies (Air) P.Rambabu
26.10.1999 Tuesday	Energy and Env't. J.Parikh	Sectoral policies and case studies (Water) P.Appasamy		Energy Efficiency S.Reddy
27.10.1999 Wednesday	Logit-probit Models S.Sarkar	GE Models Ganesh Kumar	Bio-diversity J.Parikh P.G.Babu	
28.10.1999 Thursday	Poverty and Env't. J.Parikh	Urbanisation S.Reddy	Group Discussions	
29.10.1999 Friday	Env't. laws, regulations and institutions P.K.Ramesh			

FOURTH WEEK

<i>Date/Day</i>	<i>Session – I 10.00 - 11.15</i>	<i>Session – II 11.45 - 1.00</i>	<i>Session – III 2.00 - 3.15</i>	<i>Session – IV 3.45 – 5.00</i>
1.11.1999 Monday	Climate Change J.Parikh	Agriculture, Trade and Env't. Katar Singh		Env't. Impact Assessment P.Rambabu
2.11.1999 Tuesday	Trade and Env't. Partha Sen			Life-cycle analysis P.Rambabu
3.11.1999 Wednesday	Economic and Env't. Instruments A.Markandya		Group presentations	
4.11.1999 Thursday	Group Presentations		Pollution Control in SSI U.Sankar	Abatement cost
5.1.1999 Friday	Valedictory function			