CHAPTER TWO

DEVELOPMENT OF ENVIRONMENT STATISTICS IN INDIA

2.1 Introduction

Although the whole world has now at last woken up to realize the threat to their precious environment due to depletion of natural resources and the growing pace of degradation of the environment, it has been well appreciated in India since long. Environmental issues, which have been for a long time part of Indian thought and social processes, are reflected in the Constitution of the Republic of India adopted in 1950. The Directive Principles of State policy, an integral and significant element of constitution of India, contain provisions, which reflect the commitment of the State to protect the environment with regard to forests and wildlife. The Directive Principles of State Policy enjoin upon the citizens of India the special responsibility to protect and improve the environment. The roots of the growing trend towards popular participation in our conservation and natural resource development programme lie in this constitutional requirement. The foundation of the present day institutional framework for environmental programmes in India goes back to the 1970s with the establishment of the National Committee of Environmental Planning and Coordination immediately after the historic Stockholm Conference on Environment held in 1972. The Committee was gradually upgraded into a Department of Environment in 1980 and five years later to a full-fledged Ministry of Environment and Forests (MOEF) of the Government of India (GOI). The State Governments also followed this example by establishing their own Departments of Environment to address the rapidly increasing policy initiatives and programmes in the environment and forests sectors.

Ministry of Environment and Forests has engaged itself in the task of managing country's environment by focussing on the development of important administrative tools and techniques, impact assessment, research and collection and dissemination of environmental information. However, environment being a multi-disciplinary subject involving complex subjects like Bio-diversity, Atmosphere, Water, Land and Soil and Human Settlements, it seemed difficult to collect, analyse and study relationships among them. It, therefore, became necessary to develop an efficient statistical system on environment that could meet the growing demand of data on various aspects of environment by the various governmental agencies, environmentalists and general public.

2.2 Setting up of Environment Statistical Unit in Central Statistical Organisation

Recognising the importance of Environment Statistics as an emerging area, the subject was first discussed in the fifth Conference of Central and State Statistical Organisation (COCSSO) held at New Delhi in 1981. The Conference recommended the need for developing an appropriate environment statistical system in the country. The subject was again discussed in the Sixth and Seventh Conference of Central and State Statistical Organisation. On the recommendation of the Seventh Conference of Central and State Statistical Organisation held in 1985, a multidisciplinary working group comprising Department of Environment, Central Statistical Organisation (CSO), State Directorate of Economics and Statistics, and other concerned Central and State organisation and research institutions involved in the related subjects, was set up in CSO under the Chairmanship of Director General of Central Statistical Organisation in July,

1986. The Working Group in its Report submitted in 1990 suggested a provisional list of variables for Framework for Development of Environment Statistics. The group also suggested a few variables on which data needed to be collected on priority basis.

During the second half of 1996, a Steering Committee on Environment Statistics under the chairmanship of Director General, Central Statistical organization was constituted. In its first meeting held in January 1997, a draft framework for the development of environment statistics was discussed along with the table formats to be used for preparing the compendium. The data source agencies were identified and it was decided to hold a workshop cum second meeting of the Steering Committee to discuss draft compendium of environment statistics. The workshop cum second meeting was held at Pune in March 1997. As per the recommendations of the second meeting, the said draft compendium was modified and finally got approved in the third meeting of the Steering Committee held in August 1997.

2.3 Compendium of Environment Statistics

The Central Statistical Organisation brought out five issues of the publication entitled "Compendium of Environment Statistics" for the years 1997, 1998, 1999, 2000 and 2001 presenting available data relating to environment of the country. It is an effort to collect Statistics related to different factors that are affecting our environment. Although, the present coverage of information in the compendium may not be exhaustive with respect to entire domain of Environment, it does however provide a glimpse of the present scenario of the environmental degradation, its causes and the reasons for concern. It provides the necessary base to bring out the magnitude of the problem. The compendium consists of seven chapters, as already stated in oerview.

The first two chapters give a general introduction to environment, its degradation through different sources and their impact on human health and the development of environment statistics in India. The remaining five chapters are on Biodiversity, Atmosphere, Land/soil, Water and Human Settlements. Besides, statistical tables depicting environment data, suitable graphs and charts have also been added to make the publication more user friendly.

2.4 National Workshop on Environment Statistics

To disseminate information on the development of environment statistics in India and provide a forum for interaction between users and producers, three National Workshops on Environment Statistics have been organised. The first one was organized in Goa in January 1998, the second one was held at Hyderabad during April, 2000, the third one in February, 2001 at Thiruranthapuram and the fourth one was held in April, 2003 at Shillong. All the workshops were attended by academicians, data users, and data producing agencies. The technical sessions focussed on different aspects of the environment such as environment statistics, population and human health, status of databases on different types of pollution, status of data bases on human settlements and impacts on other aspects of the environment; status of data base on land and soil and degradation; and natural resource accounting. Proceedings of all the National Workshops have been brought out in the form of a book. The workshops made several recommendations some of which are as follows:

i) Conduct of similar workshops at the regional level by involving State departments of environment, forests, pollution control boards and other local level organisation for database development.

ii) Continued publication of the Compendium on Environment Statistics at regular intervals, increased interaction between data producers and users to improve the coverage of the publication and production of similar publications at the State level.

iii) Strengthening of the Environment Statistics Unit and expansion of membership of the Steering Committee on Environment Statistics to include other data source agencies and academic users, and establishment of linkages with the Environmental Information System (ENVIS) of the Ministry of Environment and Forests (MOFF) for database development and maintenance.

iv) Development of sound statistical methodologies for estimation of generic, specific, and ecosystem biodiversities.

v) More frequent interactions (in the form of training courses and seminars/workshops) between statisticians and environmental scientists to clarify concepts and definitions as well as methodologies used in environment statistics and formation of small technical committees within CSO composed of representatives of the offices dealing with environment and statistics to identify new data to be included in the Compendium, standardize concepts and definitions of terms, etc.

vi) Some additional data from the Network of ENVIS may be included in the compendium.

vii) The data on area of wetlands, biosphere reserves, Joint Forest Management Committees set up by various State Governments and Eco Villages and cities and medicinal plants and data about 15 major thrust areas of the Ministry of Environment and Forests may be included in the compendium.

viii) It was decided that a small Committee under the chairmanship of DDG, CSO and the representations of data source agencies as members may be formed to review the contents of the compendium.

ix) Soft copy of the compendium in CDs may be prepared in addition to printing hard copies.

x) State Government may also bring out State Compendium on Environment Statistics on the lines of CSO Compendium.

xi) All the Ministries/Organisations implementing projects, which have impact on environment, should be well equipped with statistical personnel trained in environmental sciences to enable them to carry out impact studies.

xii) More data on pollution load by classification of industries is required to be generated. The data on pollution being collected once by CSO through Annual Survey of Industries should be continued on a regular basis and help of the Ministry of Environment and Forests may be obtained, if necessary.

xiii) There should be linkages between organizations dealing with coastal management and Central Water Commission and All India Soil and Land Use Survey as water shed management plans need to have an over all integrated assessment of carrying capacities.

xiv) There is an urgent need for establishing a system for collection of Solid Waste Data on all India basis especially from towns and cities. The computer programmes developed for disposal of solid wastes, especially, bio-medical wastes, available with Prof. Rama Rao may be used by CSO.

xv) The requirement of well-equipped information system was felt for mitigating suffering of the people affected by the natural disasters. The provision and availability of relief material including the

equipment required for convalescing the people trapped inside debris or under water may be ensured with the concerned district and local authorities.

xvi) Various research institutions working in the area of environment should have closer interaction with official data producers for preparing in a uniform environmental data base. Need for development of environmental information system (EIS) at the lowest level of administration was also felt.

xvii) An expert group might be constituted in CSO to look at the various suggestions emerged in the two-day workshop and examine the indicators presently being compiled in the Compendium, to suggest about their periodicity, inclusion or exclusion, spatial level of desegregation, etc. The weakness of the data may be indicated whenever necessary.

xviii) The State DES should be entrusted with the task of computing state NRA. CSO may provide necessary technical and financial assistance for the same.

xix) Need for preparation of Directory of Organisation/ institutions in the country involved in Environmental research /study / training including development of database of Environment Statistics.

xx) The role of remote sensing data may be explored in creation of database of environment statistics

xxi) Organization of workshops/seminars on various specific subjects/ sectors so that subject/sector wise specific guidelines/ standard methodologies may be firmed up.

2.5 Training on Environment Statistics

Environment statistics being a multi disciplinary subject, the Statisticians working both at the Centre as well as State Governments are not fully familiar with the relevant terminologies and concepts. To fulfil this need, the Ministry of Statistcs & PI has organized two week International Training Programme on Environment Statistics with financial support from Asian Development Bank. Twenty-two participants from South and South East Asia, including nine from India, participated in this programme. The second such training programme has been organized at Hyderabad during December, 2000 and the third one again at Hyderabad during April, 2001. The fourth training was organised at Jadavpur University in 2002. Two training programmes on Environment Statistics were organised in the year 2003 at EPTRI, Hyderabad and at NEHU, Shillong. Some short duration training courses of say 1 to 2 weeks are needed to familiarise with the subject and CSO can associate specialised research institutions/universities in this effort. In addition, some specialised courses of medium duration say one to three months duration as well as exposure to international scenario may also be needed to develop expertise in these areas.

2.6 Natural Resource Accounting

The economy draws inputs from the environment. These consist of natural resources, both non-renewable and renewable including mineral resources, timber and non-timber forest produce, aquatic resources, and also the ecosystem services *viz.* recycling of nutrients and supply of clean air and water necessary for sustaining life. Besides, economy also uses the environment as a sink for dumping unwanted wastes generated in industrial and other anthropogenic activities.

The conventional accounting [System of National Accounting (SNA)] though operates in natural environment, hardly takes into account the environmental components and the goods and services they contribute to the economic development. Rather, it is entirely based on monetary

considerations, which if dealt in isolation may prcve disastrous, both to the economy as well as to the environment. Hence, links between economy and environment have to be properly understood and appreciated in order to achieve sustainable development of the society. For which, there is an urgent need to generate data on environmental goods and services and their valuation in economic terms, so that information generated can be used for proper policy formulation to achieve overall sustainable development of the society.

As a result, concept of Integrated Environmental and Economic Accounting (IEEA) has emerged on the initiative of the United Nations. The main objectives of integrated environmental accounting are segregation and elaboration of all environmental and economic accounts, linkages of physical resource accounts with monetary environmental accounts and balance sheets, assessments of environmental costs, benefits and accounting for the maintenance of the tangible wealth. It is, thus, a complete accounting procedure for environmental assets. The IEEA later revised and termed by London Group as System for Environment and Economic Accounting (SEEA-2000) takes into consideration the contributions of the environment to the economy or the impacts of the economy on the environment. However, data on environmental components and the goods and services rendered by them, and their valuation in economic terms required for Environmental Accounting are lacking in various areas like Land, Water, Air, Energy, Agriculture, Forest, Mining, Industry etc. At present, in the fast changing environmental and economic scenario, such data pertaining to various natural resources are highly desirable for proper policy formulation for sustainable development.

The field of Environmental Accounting of Natural Resources in India is still in preliminary stage. However, significant work done by different groups on methodology of generating data and adding values to it (Chopra and Kakekodi, 1997; Parikh and Parikh, 1997; Kakekodi, 2002) has given impetus for fast development of the area. **The entire process of Environmental Accounting of Natural Resources involves three steps viz. Physical accounting; Monetary valuation; and Integration with national income accounts.** Physical accounting determines the state of the resource- types and extent (qualitative and quantitative) in spatial and temporal terms. Once the physical account of resources is available, monetary valuation is done to its all tangible and intangible components. Thereafter, the net change in natural resources in monetary terms is integrated into the Gross Domestic Product in order to reach the value of Green GDP of a nation/state/region. The process does not require any change in the core system of SNA, rather it is achieved by establishing linkages between the two.

2.7 Natural Resource Accounting in India

The economic development of a country or region is generally expressed in terms of the growth of its income. The value of the final product excluding the value of inputs used in the process of production is termed as the Gross National Product (GNP). However, these indicators of economic development do not take into account the use and depreciation of the renewable or non-renewable natural assets. But the growing scarcity of these resources has forced the policy-makers to develop the natural resource accounts. Following other countries, India too has given due thought to this phenomenon and initiated a pilot project on Natural Resource Accounting in Goa. After the development of a suitable methodology, it may be extended to other states as well as so as to arrive at an overall estimate for the country. A Technical working Group on Natural Resource Accounting has been constituted in the Ministry of Statistics & Programme

Implementation and the first meeting took place in November 1997. Following the deliberations, a concept paper was got developed which was considered by the Technical Working Group in its meeting held in September 1998. The Group has recommended that scope of study would be to cover all sectors of the economy; however, the major emphasis will be given to Forests and Biodiversity, Minerals, Marine Resources, Tourism and Energy. The project is to be implemented in two phases. In the first phase, the Natural Resource Accounting will be attempted with the available secondary data and identify the gaps and requirement of additional primary data to be collected. The first phase was started in April 1999. The project was implemented by TERI under close supervision of Directorate of Planning, Statistics and Evaluation, Government of Goa. TERI had submitted its draft report on the first phase of this project. The report was considered by the sub-group in its meeting held on 25th January, 2001. As it required major revision, TERI was requested to revise the report. The revised report was considered in a meeting held in February, 2002 chaired by Secretary, MOS & PI and accepted with some modifications. The modified version of this Report has now been submitted by TERI. After consideration of this Report by CSO, the proposals for Second Phase of the Project to be undertaken in a few more States will be formulated. The findings of the study generated a lot of discussion in the National Statistical Commission which, inter-alia, recommended replication of the Goa (Phase-I) project in other States also.

Recently, four more projects on NRA were approved in MOS & PI to different institutions, namely, IIFM (Bhopal), IEG (Delhi), TERI Delhi and CMDR (Karnataka) on different sectors like forestry, land, mining, soil, air, etc in order to develop uniform methodology for each sector separately. The progress of these projects is being monitored by the Technical Monitoring Committee constituted for this purpose under the Chairmanship of Prof. Amitabh Kundu of JNU

Four more projects on NRA, namely, Study on NRA-Revised proposals for land and forestry (excluding mining) sectors in A.P., (EPTRI, Hyderabad), Environment Accounting of land and water in Tamilnadu (Madras School of Economics, (Chennai), NRA for selected States in India (W.B. & Tripura) on air and water (Jadavpur University, Kolkata) and Environment Accounting of Natural Resources of Meghalaya, Phase-I, for sectors land and forest resources (NEHU, Shillong) are in the pipe line.

The Ministry of Statistics & Programme Implementation has initiated action for taking up Goa Phase-II project for sectors other than those covered in Phase-I and in Uttaranchal (all Sectors).