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Data for Development Policy, Planning
and Evaluation

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Data for Development Policy, Planning and Evaluation

Sources, Nature and Limitations

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Abstract

Sustainable development is all about improving the lives of the people without comprising the quality of life of future generations. Development policy and planning must be based on the hard evidence about the people, how they live and how their lives are changing. Development policy and planning must also take into account how the population stock - the size and structure of the population - and the life style pattern are impacting upon the environment. Development data provide the hard evidence about the people and their life styles and, therefore, are critical for the success of all development policies and programmes. the current understanding about development data is at best fragmentary and awareness about sources, nature and limitations of different types of development data remains poor. At the same time, lack of high quality development data and access to existing data are fundamental challenges to the use of development data for evidence-based planning and evolution of sound development and welfare policies. In this paper, we discuss different sources of development data for sustainable development planning, monitoring and evaluation and analyse their nature and limitations. We also suggest a comprehensive population, development, environment data system to support development policy and planning and monitoring, evaluation and impact assessment of development programmes and activities.
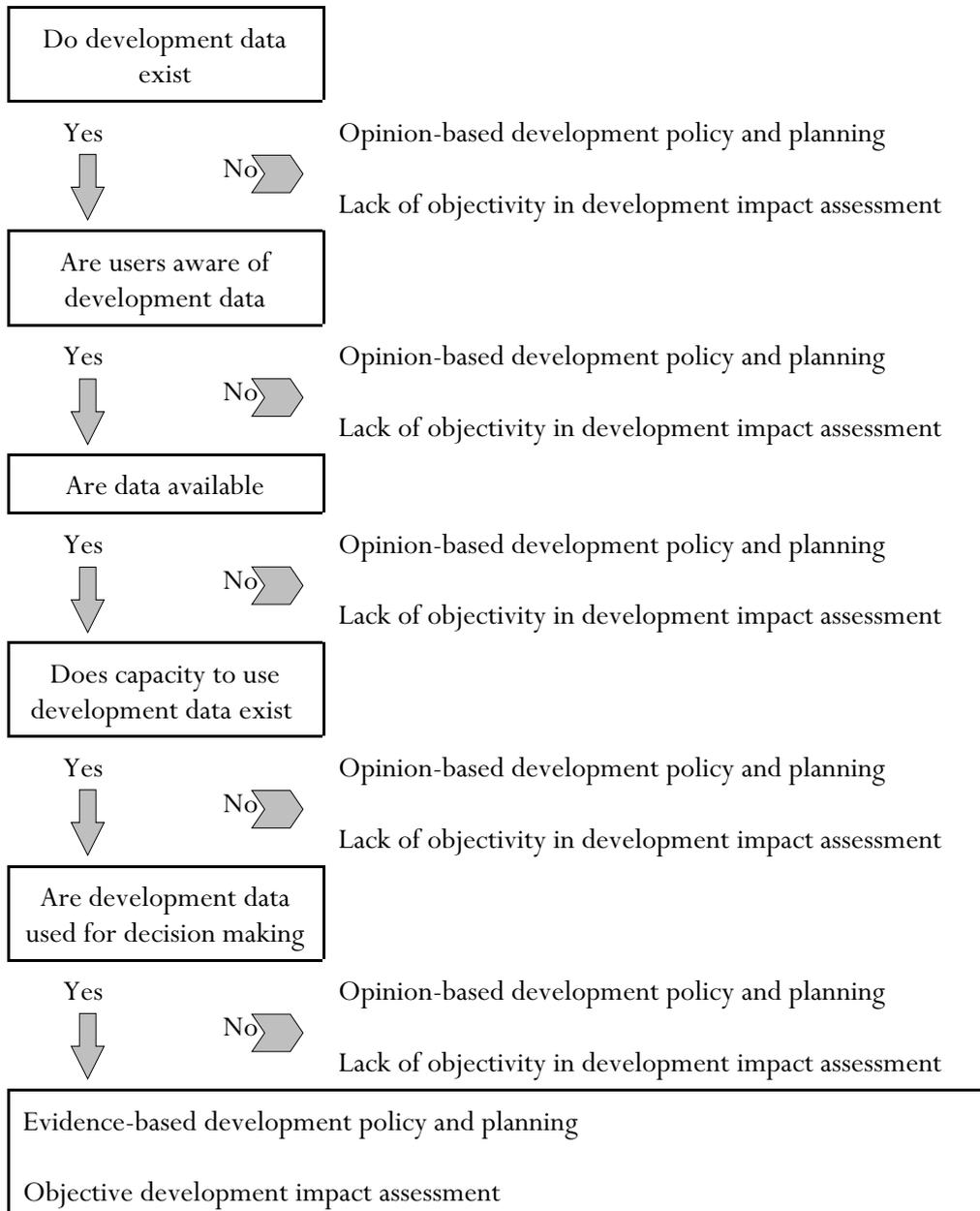
Introduction

Sustainable development is all about improving the lives of the people without comprising the quality of life of future generations. This implies that development policies and programmes must be oriented towards the development and welfare needs of the people while preserving the environment. In other words, development policy and planning must be based on the hard evidence about the people, how they live and how their lives are changing. Development policy and planning must also take into account how the population stock - the size and structure of the population - and the life style pattern are impacting upon the environment. Development data provide the hard evidence about the people and their life styles and, therefore, are critical for the success of all development policies and programmes. Development data may be likened to money in an economy and blood in the system of human being. However, the current understanding about development data is at best fragmentary and awareness about sources, nature and limitations of different types of development data remains poor. At the same time, lack of high quality development data and access to existing data are fundamental challenges to the use of development data for evidence-based planning and evolution of sound development and welfare policies, evaluate development programmes and lead development activities that are directed towards improving the quality of life of the people.

Evidence-based development policy and planning may be contrasted with the opinion-based development policy and planning. Figure 1 describes how development data can contribute to evidence-based development policy and planning and how lack of the development data or the inability to access the development data or limited capacity to use the available data can shift the emphasis from evidence-based development policy and planning to opinion-based policy and planning. Since, the opinion-based development policy and planning is not usually based on an objective assessment of the ground situation and actual development and welfare needs of the people, it generally turns out to be normative in scope and has limited impact in terms of the improvement in the quality of life of the people.

Figure 1 describes how lack of development data or unawareness about development data or non-availability of and limited access to the development data as well as poor to very poor capacity of analysing and using the available data leads to opinion-based development policy and planning. The figure also shows how lack of development data or the inability of using the available data may lead to a subjective evaluation of the impact of development programmes and activities in terms of improvements in the quality of life of the people and in preserving the environment. The figure clearly emphasises the need of establishing institutional frameworks and mechanisms that may ensure easy access to and easy availability of development data of different nature at different tiers of development administration system. At the same time, there is also a pressing need to increase the awareness and facilitate easy access and uninterrupted availability of different types of development data and to build up the capacity to use the development data for development policy and planning and for objectively assessing the impact of development programmes and activities.

Figure 1

Development data and development policy planning and evaluation

| Do development data exist |

Yes

No ▷ Opinion-based development policy and planning

Lack of objectivity in development impact assessment

| Are users aware of development data |

Yes

No ▷ Opinion-based development policy and planning

Lack of objectivity in development impact assessment

| Are data available |

Yes

No ▷ Opinion-based development policy and planning

Lack of objectivity in development impact assessment

| Does capacity to use development data exist |

Yes

No ▷ Opinion-based development policy and planning

Lack of objectivity in development impact assessment

| Are development data used for decision making |

Yes

No ▷ Opinion-based development policy and planning

Lack of objectivity in development impact assessment

| Evidence-based development policy and planning

Objective development impact assessment |

Development data can broadly be classified into three categories. The first category of development data are related to the people, beneficiaries of all development activities. Since improvement in the quality of life of the people is the ultimate objective of all development activities, data related to population stock - size, structure, quality, etc. - have important implications for development policy and planning.

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The second category of development data are related to social and economic development processes. This may include resources needs for development programmes and activities and their quality, data related to development programmes implementation and information related to outputs of development programmes and activities that impact upon the quality of life of the people as well as on the environment.

The third category of development data are related to environmental conditions that impinge upon the quality of life of the people and that have potential of endangering the very existence of life on the planet Earth. It is important that links are established between the date related to people, data related to social and economic development processes and data related to the environment so as to ensure that the process of social and economic development does contribute to improving the quality of life of the people without having a negative impact on the environment.

The most commonly used framework for development is the results framework. This framework breaks down development activities according to the logical components of the implementation processes and for each component, objectively verifiable indicators are defined for planning, monitoring and evaluating development programmes and activities. While developing or selecting indicators, it must be recognised that basic orientation of development processes varies by administrative and managerial hierarchy. Basic orientation of social and economic development policy and planning at national and state level is radically different from that at the grass roots level. At the grass roots level, the development process must focus on development and welfare needs effectiveness and the capacity efficiency of the development administration system. By contrast, at national and state levels, the primary concern of development is on the realised efficiency. At the grass roots level, development indicators should be simple, easy to measure, devoid of technical jargons and capable of straightforward interpretation. More complex development indicators may be retained at higher levels of development administration and management where necessary technical capacity exists or may be created. This implies that development data needs vary by the hierarchy of the development administration system, although it is possible to establish a link between development data needs at different tiers of development administration. This is an important consideration in discussing the availability of development data at different tiers of development administration.

The purpose of the present paper is to present an overview of sources of the three categories of development data described above and to discuss the nature, scope and limitations of the available development data in the context of evidence-based development policy and planning, evaluating development programmes and leading development activities. The need for discussing the availability, scope and limitations of development data has become all the more in recent years because of the decentralisation of the development planning process and the demand for quantifying the progress in terms of improving the quality of life of the people. Success of the decentralised approach to development planning depends crucially on the availability and use of local level development data for planning for meeting the development and welfare needs of the people.

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Development Data Related to People

Data related to the people is perhaps the most important development data which reflect the quality of life of the people. For example, the most widely used indicator of measuring the quality of life of the people is the expectation of life at birth which indicates the average number of years, a person is likely to survive from birth under the prevailing mortality conditions. Mortality, in turn is shaped by a host of social, economic, cultural, environmental and technology related factors.

There are a number of sources which provided data related to the people in India. These sources are described, in some detail, in the following pages.

Population Census. The most widely known of source of data related to people in India is the decennial population census. India has the unbroken series of decennial population census now spanning more than a century. Among the developing countries of the world, the record of India in conducting census of the population at every 10 year is beyond parallel. The unbroken series of decennial population census in India provide an extraordinary valuable storehouse of data related to the people. The synergistic possibilities of analysis of the quality of life of the people inherent in successive census descriptions of the people of the country are truly remarkable. In the hands of skilled analyst, data available through the population census can be transformed into reliable estimates of population characteristics reflecting the size and structure of the population and quality of life of the people.

The history of first synchronous population census in India dates back to 1981, although, the earliest literature suggests that some kind of population count was maintained in India during the *Vedic* period. The celebrated *Arthashastra* by *Kautilya* written in the 3rd Century BC prescribed the collection of population statistics as a measure of state policy for taxation. It contained a detailed description of methods of conducting population, economic and agricultural census. During the regime of the Mughal king *Akbar*, the administrative report *Ain-e-Akbari* included comprehensive data pertaining to population, industry, wealth and many other characteristics that reflected the quality of life of the people at that time. A systematic and modern population census, in its present form, was however conducted non synchronously between 1865 and 1872 in different parts of the country. This effort culminating in 1872 which is often labelled as the first population census of India. Since 1981, population census in India have been undertaken uninterruptedly once every ten year. The latest population census, conducted in 2001 was fourteenth in the series. Population census in India collects a range of data related to the quality of life of the people at the individual level as well as at the household level. A description of the data related to the people collected at the 2001 population census is summarised in Box 1.

Population census is the only source of data which covers all people, all households and all habitations of the country. However, prior to the 2001 population census, the analysis of the information collected at the census was confined to only 20 per cent of the households and, on the basis of this analysis, estimates were prepared for the entire country. At the 2001 population census, for the first time, efforts were made to analyse the information collected from all households and individuals.

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Box 1
Data Available through Population Census

Data related to Households
- Use of the census houses
- Condition of census houses used as residence
- Predominant material of the roof, wall and floor or the census houses
- Type of structure of census houses
- Number of dwelling rooms
- Ownership status of the house
- Number of married couples and whether they have independent sleeping rooms
- Source of drinking water (e.g., Tap; Hand pump; Tube well; Well; Tank; Pond River; canal; Spring; Other) and its location
- Source of lighting (e.g., Electricity; kerosene; Solar energy; Other oil, Any other; No lighting)
- Availability of bathroom, type of latrine and type of drainage for waste water
- Availability of separate kitchen and type of fuel used for cooing (e.g., Firewood; Crop residue; Cow dung cake; Coal, Lignite, Charcoal; kerosene; LPG; Electricity; Bio-gas; Other)
- Availing of banking services and availability of the specified assets (e.g., Radio, Transistor; Television; Bicycle; Motor Cycle, Moped; Car, Jeep, Van; None of these

Data related to People
- Relation to head of the household
- Sex
- Age at last birth day
- Current marital status
- Age at marriage
- Religion
- Name of Scheduled Caste/Scheduled Tribe
- Mother tongue
- Other languages Known
- Highest educational level attained
- Attending educational institution
- Disability status
- Worker/non –worker
- Main Worker / Marginal Worker
- Economic activity of the main or marginal worker
- Non–economic activity of Marginal worker and non–worker
- Marginal worker or non-worker–seeking / available for work
- Distance and mode of travel to place of work
- Place of Birth
- Place of last residence
- Duration of residence at place of enumeration
- Reason for migration
- Number of children ever born (For ever married women only)
- Number of children surviving (For currently married women only)
- Area of land cultivated (For cultivation households only
- Tenancy status

Source: Registrar General and Census Commissioner of India

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Civil Registration. Another source of data related to people are the data about births and deaths available through the civil registration system. The registration of births and deaths in India was started on voluntary basis and there was no uniformity in statistical returns resulting in both under-registration and incomplete coverage vital events. In order to unify the civil registration activities, the Registration of Births & Deaths Act, 1969 was enacted under which registration of all births and deaths is mandatory. However, despite the enactment of the Act way back in 1969, the completeness of registration of births and deaths in several states and Union Territories in the country still remains far from satisfactory. In the developed countries, information available through the civil registration system is a very valuable source of development data related to the people. In India, on the contrary, information available through the civil registration system is rarely used in development research and development policy and planning because of a host of factors, the most important of which is the incompleteness of the reporting of vital events.

Sample Registration System. The Sample Registration System was introduced in India on a pilot basis in the year 1964 65 on a pilot basis to generate reliable and continuous data related to key demographic indicators at national and sub-national (State) levels. In 1969-70, the system was launched throughout the country. The system has since been providing data on vital events on a regular basis. The Sample Registration System is the only source of demographic data in India which provides data related to key demographic indicators on an annual basis.

The Sample Registration System is based on a dual record system. Field investigations under the system comprise of continuous enumeration of births and deaths in a sample of villages/urban blocks by a resident part time enumerator, and an independent six monthly retrospective survey by a full time supervisor. Data obtained through these two sources are matched. The unmatched and partially matched events are re-verified in the field to get an unduplicated count of correct events. The advantage of this procedure, in addition to elimination of errors of duplication, is that it leads to a quantitative assessment of the sources of distortion in the two sets of records making it a self evaluating technique. At present, the system is operational in 7,597 sample units (4,433 rural and 3,164 urban) spread across all States and Union territories of the country and covers about 1.5 million households and 7.10 million population. Estimates available through the Sample Registration System are known to be associated with random errors of unknown origin. In order to eliminate these errors, the practice is to use three-year moving average instead of annual estimates available through the system. The system is designed to provide development data related to people at the national and state level only, although, there has been some attempts to analyse the information available through the system at the regional level in each state. The system does not provide estimates of key demographic indicators at the district and below district level. However, the system does provide estimates of key demographic indicators separately for different population groups including rural and urban population as w, male and female population and, therefore, is of little use in decentralised development planning as well as monitoring and impact assessment of development activities.

National Family Health Survey. The National Family Health Survey was instituted in 1992-93. It is a large-scale, multi-round survey which is based on statistically representative sample of households throughout India. Three rounds of the survey have been conducted since 1992-93. The survey provides national and state level information related to fertility, infant and child mortality, the practice of family planning, maternal and child health, reproductive health, nutrition, anaemia, utilization and quality of health and family planning services. Each round of the National Family Health Survey has two specific goals: a) to provide essential data on health and family welfare status of the people that may be used for health and family welfare policy and planning, and b) to provide information on emerging yet important health and family welfare issues. The third round of the survey, conducted in 2005-06 has also collected information related to men and unmarried women, and on such issues as HIV/AIDS related behaviour, attitudes towards family life education for girls and boys, use of Integrated Child development Scheme, men's involvement in maternal care, health insurance, etc. Moreover, estimates of HIV prevalence have also been provided by the survey on the basis of the blood sample collected in every state of India. Estimates of HIV prevalence are available for India and for Andhra Pradesh, Karnataka, Maharashtra, Manipur, Tamil Nadu and Uttar Pradesh.

District Level Household Survey. The district level household survey was commissioned in 1998-99 by the Government of India, Ministry of Health and Family Welfare to provide information about family planning, maternal and child health, reproductive health of ever married women and adolescent girls, utilisation of maternal and child health care services at the district level. This is the only survey which provides development data related to people at the district level. The survey also provides information related to new-born care, post-natal care and coverage of beneficiaries under different government schemes such as *Janani Suraksha Yojana*. The third round of the survey was conducted in 2007-08 which also provided information the facilities available in the public health institutions -Sub-health centre, Primary Health Centre, Community Health Centre and District Hospital accessible to the sampled villages. This is the only country wide survey that provides development data of the people at the district level. The survey, however, does not provide development data for different social groups separately because the sample covered in one district is very small.

Medical Certification of Causes of Death. The scheme of medical certification of the cause of death was launched by the Government of India in selected states during the Third Five-year Plan as part of the civil registration system. The scheme provides cause-specific mortality profiles and is a key indicator for analysing the health trends of the population in a scientific manner The information available through the scheme is of considerable use to public health planners, administrators, medical professionals and research workers, and for assessing the effectiveness of public health programme. Medical certification of the cause of death under the civil registration system has got statutory backing under the Registration of Births and Deaths Act, 1969. Ideally, the scheme is to be implemented in all hospitals of the country so that all deaths can be certified medically about the cause of death. However, by 1999, only about 15 per cent of the estimated deaths in India could be medically certified about the cause of death.

Development Data Related to Social and Economic Conditions

Unlike data related to the people, there are not many sources of data related to social and economic conditions in India. In general, one relies upon data and statistics provided by the government and non-government agencies involved in the implementation of various social and economic development programmes and activities. These official data and statistics about social and economic conditions, however, is not a reliable source for assessing social and economic conditions because they are associated with a number of errors. In fact, a comprehensive development management information system does not exists in the country at any tier of development administration that can generate data related to social and economic conditions for development planning, monitoring and evaluation as well as for development research.

National Sample Survey. The National Sample Survey was initiated in 1950 as a nation-wide, large-scale survey conducted in successive rounds to fill up data gaps for development policy and planning. Each round of the survey covers a specific subject of contemporary interest. Like the Sample Registration System, the National Sample Survey also provides estimates up to the state level only, although, information available through the survey has also been used for below state level analyses also. Perhaps, the most encouraging aspect of the National Sample Survey is that the unit level data are available either on payment or free of cost after entering into a memorandum of understanding with the National Sample Survey Organisation.

Till date 65 rounds of the national sample survey have been conducted throughout the country. These surveys have provided reliable data on various aspects of social and economic perspectives in India and in its constituent states. Some of the key areas that have been covered under these surveys include
- Consumer expenditure
- Employment and unemployment
- Land and livestock holdings
- Housing conditions
- Village facilities
- Urban slums
- Disability

It has also been conceived that the constituent states of India will also evolve mechanism on the lines of national sample survey to organise state specific sample survey to general data related to social and economic conditions on a regular basis. However, in most of the states, no such mechanism has been evolved. There exists a very substantial capacity gap at the state level to organise such sample survey which is both complex and multi-dimensional in scope and coverage. As such, assessment of social and economic conditions below the state level in India is a mere guess. Some very limited information and hard data are available through the population census but this information is grossly inadequate. Village level data about social and economic conditions in India is largely non-existent other than that generated through population census. Since, population census is conducted at an interval of 10 years, the social and economic data generated through population census is or very limited use for development policy and planning.

Development Data Related to Environment

Issues related to environment, as it is related to population and development, can be grouped into two broad categories - local level environmental issues and global environmental concerns. In any case, all the environmental concerns of population and development may be conceptualised in the framework of natural resources use and associated wastes generated which, in turn, depend upon the type of technology used. The most commonly used framework linking environmental concerns with population, development and technology is the IPAT framework. This framework conceptualises the environmental impact (I) in terms of population (P), affluence or level of development (A), and the state of technology (T). The advantage of this simple model is that it can be applied in the context of global environmental concerns as well as in the context of local environmental issues. Using the IPAT framework, the environmental impact of human activity may be explored in two ways - in terms of resource use and in terms of wastes generated as the result of resource use. One way of exploring the impact of human activity on resource use is the analysis of the trends in energy use. In this context, the IPAT framework may be translated into

$$E = P*g*(e/g) = P*g*I.$$

Where E denotes total energy use, g denotes the gross national product per capita or per capita income and is a measure of affluence and e denotes the per capita energy consumption so the ratio $i=e/g$ is the energy intensity which reflects the structure of the economy and the efficiency of energy use and, therefore, is a measure of what is known as the technology intensify. For example, a service-oriented economy is generally argued to be less energy intensive than an industry-oriented economy which is in the early stages of industrialisation and which requires large amount of energy for its social and economic production system. Similarly, the impact of the human activity on the environment may also be assessed and analysed in terms of the wastes generated. Since fossil fuel is the primary source of energy and CO_2 is released as the result of burning fossil fuels, the IPAT framework may be translated into what is known as the Kaya identity:

$$C = P*g*i*k$$

where C is the total CO_2 emission and k is the carbon intensity. It is the ratio of total CO_2 emissions per unit of energy use. It reflects the fuel mix of the energy system, in particular, the share of the energy from renewable sources and energy from nonrenewable resources; and, among the nonrenewable resources, the share of highly carbon intensive sources such as coal and less carbon intensive sources such as natural gas.

The above simple yet straightforward approach of analysing population, development and environment relationship has also been criticised for a number of perceived flaws. The primary argument is that any analysis of population, development and environment relationship must take into consideration the social, cultural and political contexts of human activity. It is also argued that P, A and T variables may at best be viewed as proximate variables of the environmental impact. They, themselves, are determined by a host of indirect but more fundamental factors associated with human activity which are not accounted by the simple IPAT model. In order to circumvent many of the perceived limitations of the conventional IPAT model, a stochastic version of the

simple PAT model has also been developed and applied. Nonetheless, frequent availability of information related to population size and growth as well as trends in affluence measured in terms of income per capita has prompted widespread use of the simple IPAT approach. Moreover, the simple IPAT model illustrates an important consequence of the multiplicative relationship between the driving forces - each variables amplifies changes in other variables in the model. As a result, a small change in technology may have only a small absolute effect on energy use and CO_2 emissions in a country with a small population and low levels of income, while the same change would have a much greater effect in a populous, affluent country.

Country level estimates of energy use and CO_2 emissions have been prepared by a number of international organisations including World Bank, Earth Trends and Carbon Dioxide Information Analysis Centre of the United States Department of Energy. However, such information is not available for the Indian states. The environment database maintained by the Environment Information Centre set up by the Government of India, Ministry of Environment and Forests does not contain state specific information about energy use and CO_2 emissions. The primary objective of the Centre is to act as an one-stop source for quality environmental data on India. It acts as a repository of Indian environmental data and provides site specific information in a timely manner to facilitate environment related planning and decision-making. Unfortunately, the data available through the Centre is not freely available. This is a major hindrance against the use of the data.

A major challenge to analysing the environmental impact of population and development at the local level is deciding about the indicators of environmental impact that may be causally linked to population and development scenario. These indicators need to be developed in the locally specific context and, therefore, may vary from one place to another. This variation in the local context of population, development and environment relationship inhibits evolution of a standard framework of analysis of population, development and environment interaction as has been evolved at the national and global level.

Conclusions

India needs a comprehensive data system that can meet data demand for analysing population, development and environment interactions. Such a system does not exists at present, although efforts have been initiated in this direction through setting up of the Environment Information Centre. This data system needs to be evolved in the context of data needs for population, development and environment policy, planning, monitoring and evaluation. There are four major aspects in this context:
1.   The data type and its associated information system;
2.   The aggregation level of the data;
3.   The measurement of the data; and
4.   The usage of data.

Major data characteristics of the proposed population, development and environment data system are shown in Figure 2.

Figure 2
Basic characteristics of Population, Development, Environment Data System

Population, Development Environment Data System				
Data type system				
Population Data Bank	Development Indicators Data Bank	Quality of Life Indicators Data Bank	Development Programme Indicators Data Bank	Environment Indicators Data Bank
Aggregation level				
Country State District Sub-district Panchayat Village	Country State District	Country State District Sub-district Panchayat Village	Country State District Sub-district Panchayat Village	Country State District Sub-district Panchayat Village
Measurement type				
Quantitative	Quantitative	Quantitative Qualitative	Quantitative Qualitative	Quantitative Qualitative
Usage				
Policy and programme planning	Policy and programme planning	Monitoring and evaluation	Monitoring and evaluation	Impact assessment
Advocacy and legitimation	Advocacy and legitimation	Advocacy and legitimation	Advocacy and legitimation	Advocacy and legitimation

The population, development, environment data system conceptualised above may be viewed as an 'institutional mechanism' or, more specifically, as a 'tool' to support development policy and planning and to facilitate evidence-based monitoring and evaluation of development programmes and activities in the context of improvements in the quality of life and impact on the environment. It is also expected to help streamline and coordinate regular compilation and generation of relevant information to analyse population, development, interactions and monitor progress towards sustainable development.