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ENVIRONMENTAL CHANGES AND SUSTAINABLE HUMAN DEVELOPMENT IN KARNATAKA

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Abstract :- Human Development measures capture disparity and other dimensions of social well-being. However, changes in the stock of natural resources or the environment are not directly included in the computation of the indicator. However, HDI do not consider the measures of environmental aspects in it. Attaining higher human development status and sustaining it for a long time requires the dependence and extraction of resources. Therefore, Human development issues and environmental issues cannot be viewed as exclusive issues. In this context, this paper attempts to examine the relationship between Human Development (HD) and Environmental Degradation (ED) for Karnataka at district level.

KeyWords:- Environmental Changes And Sustainable Human Development

INTRODUCTION

Human beings depend on nature and environment to derive the conditions for a decent and secure life. In the last half century, humans have made unprecedented changes to the surrounding environment largely to meet rising demand of food, fresh water, fibre, shelter and energy. These changes have improved the lives of many but have come at the expense of weakening nature's ability to deliver key services such as clean air and water and protection from floods, diseases and other disasters. There are evidences that many ecosystems have reached dangerous level, at which sudden and irreversible changes have grave implications for human development. Examples include the shift in regional climate, emergence of deadly diseases, shift in agricultural production, collapse of fisheries, etc.

In the future, there are compelling reasons to believe that the welfare of societies worldwide will be increasingly tied to risks and opportunities associated with environmental problems. The global demand for food, water, fibre, shelter and energy (basic needs for human life) will continue to rise because of growth in population and incomes. In recognition of this, the ability of world's resources to meet the rising demand for sustaining livelihoods is being questioned. In other words, the path of sustainable development and human development is in question.

Human Development and Sustainable Development

The classic definition of sustainable development, 'meeting the needs of present without compromising the ability of future generations to meet their needs' was given by the Bruntland report (WCED, 1987). Prior to the Brundtland Commission, 'development' was associated with industrialization, and measured solely by economic activity and increases in wealth. Environmental protection was perceived by many as an obstacle to development. However, 'Our Common Future' recognized "environment or development" as a false dichotomy. Focus shifted to "environment and development," and then to "environment for development" (UNEP, 2007). An action plan for sustainable development, called Agenda 21, was launched in 1992 at Rio's Earth Summit (World Summit on Environment and Development), and in the year 2000, the objectives of Agenda 21 were restated as UN Millennium Development Goals, which called upon all countries to integrate the principles of sustainable development into

national policies and programs. The central theme of the definition of sustainable development is the synthesis of ecological, social and economic objectives.

The Human Development Index (HDI), developed by M. Haq, A. K. Sen and others, and popularized by the UNDP, is an alternate to conventional measures of economic development and human well-being. Enhancement of living conditions and enlarging people's choices is the guiding principle here. This conception of development looks at poverty as 'a deprivation of basic capabilities rather than merely low income' and, therefore, argues in favour of enhancement of substantive freedoms, which provide an individual with the capabilities to choose a life she/he has reason to value.

The two goals which are supported by well organised international efforts are accepted by most of the nations. At the core of both the dimensions of development, there exist the issues of human prospects/ human wellbeing/ human existence/ betterment of humankind. Though embraced by most of the international institutions, governments and policy makers, the difficulty lies in the ways to act upon.

Over the past 20 years, natural disasters have claimed more than 1.5 million lives, and affected more than 200 million people annually. More than 90 percent of the people exposed to disasters live in the developing world, and more than half of the disaster deaths occur in countries with a low human development index (UNEP, 2007). This kind of environment is not conducive to attainment of goals of sustainable development and human development.

Human Development measures capture disparity and other dimensions of social well-being. However, changes in the stock of natural resources or the environment are not directly included in the computation of the indicator. In short, HDI is not intended to, and therefore do not, measure sustainability, though this indicator may very well be affected by the conditions of environment (Dewan, 2008). The 'ultimate goal' of human development is to enhance quality of life or well-being. The environment provides essential services for human development (NEAA, 2005). In other words, a healthy environment contributes significantly to human development. Environmental degradation has the potential to undermine various dimensions of quality of life. Given the context, interactions between humans and the environment are at the core of sustainable development. There seems to be an apparent conflict between the sustainability and human development goals. Attaining higher human development may require the use of more resources, whereas ensuring sustainability may require constraining the use of resources (Dewan, 2008).

Correspondingly, sustainable development is an important concept of integrating social, economic and ecological dimensions of development and jointly addressing the objectives of conservation and change. Since these objectives cannot be achieved simultaneously as a rule, trade-offs across various objectives are inescapable (Sri and Prasad, 2007). Until sustainable practices are an integral part of the development plans of world economies, mere environmental tinkering at the edges of economic policy cannot lead to sustainable development (Panth, 2007). Thus a strategy for sustainable development is unlikely to succeed if it neglects the human development and vice versa. The two fundamental challenges the world facing today cannot be addressed in isolation.

Therefore, the issues of sustainable development and human development cannot be viewed as mutually exclusive strategies of development and hence arises the challenge of integration of both the approaches. With such an approach a cause-effect chain – involving environmental, social, and economic factors – associated with any public policy, plan or programme can be assessed to inform decision-makers. These aspects have been largely neglected both in analysis and policies. This has contributed to the high failure of many government programmes and policies.

World Bank (2010) recognises that robust economic and social strategies will be those that take into account increased uncertainty and enhance adaptation to variety of climate features – not just "optimally" cope with the climate of the past. Effective policy will entail jointly evaluating development, adaptation, and mitigation actions, all which draw on the same finite resources (human, financial, natural). The failure to attend to these issues in the preparation and design of policies will only aggravate the problems of human wellbeing and environmental crisis. This study seeks to bridge the gap. The aim of this study is to develop a broad methodology for countering these problems.

In Indian context, the benefits of high-growth economy have been unequally shared and there is a large human development backlog. Around 28 percent of the population, some 320 million people live below the poverty line, with three-quarters of the poor in rural areas. Unemployment among rural labourers, one of the poorest groups, is increasing, and almost half of rural children are underweight for their age. Superimposing incremental environmental or climate change risks on this large human development deficit would compromise the ambition of 'inclusive growth' set out in India's Eleventh Five–Year Plan (ISET-N, 2008).Climate change and loss and degradation of natural resources have the potential to severely reverse hard earned development gains of the past and constrain prospects for the future (World Bank, 2008). Gadgil and Guha (1995), arguing for environment – friendly agenda for development says that prudent, sustainable use of India's environmental resources is in the interests of vast majority of India's population. This does not mean simply balancing the conflicting objectives of economic growth and environmental protection, but rather, integrating into every step of policy formulation and execution the

insights gleaned from an ecological interpretation of the Indian development experience.

The Present Study

The present study attempts to examine the relationship between Human Development (HD) and Environmental Degradation (ED) for Karnataka at district level. Karnataka with 10 different agro – climatic zones is a highly vulnerable state to environmental changes. This may affect millions of people in rural and urban areas who depend on surrounding environment and natural resources for food production, water resources, fisheries, biodiversity and livelihoods. At the national level, Karnataka is placed at high EQI – mid HDI category (Mukherjee and Chakraborty, 2008). The current study tries to estimate the cross-district relationships between environmental degradation and Human Development for the 27 districts of Karnataka. Against this background, the study is designed with the following objectives.

Objectives of the Study

The objectives of the study are:
1.To analyse the nexus between human development and environmental degradation in Karnataka at district level.
2.To prepare appropriate Sustainable Human Development Index (SHDI) for districts in Karnataka.

Data and Methodology

The present study is based on the secondary data collected from various sources as mentioned in Table 1. Environmental quality cannot be captured through any single measurable indicator, rather it can be observed through a composite index. The composite Environmental Degradation Index (EDI) is calculated in standardised form for the 27 districts of Karnataka.

Environmental Degradation Index

To address the environmental degradation in Karnataka by districts, an appropriate Environmental Degradation Index (EDI) has been prepared by selected indicators for the year 2001. The EDI is computed mainly from the four aspects of pressure on environment namely: Population pressure on environment, Pressure on forest, Pressure of agriculture on environment and Pressure of Vehicular and Industrial Pollution on environment.

The variables considered for the computation of EDI through four kinds of pressure on environment are listed in Table 1 and the notations, specification and sources of selected variables are given in Table 2.

Table 1: Variables considered for computation of EDI

Sl. No.	Aspects of Environmental Degradation	Variables
1	Population pressure on environment	Decadal Growth of Population and Density of Population
2	Pressure on forest resources	Percentage of Forest Area to Total Geographic Area and Percentage of Households using firewood as cooking fuel
3	Pressure of agriculture on environment	Percentage of Agricultural Land to total geographical area and Usage of Fertilisers
4	Pressure of Vehicular and Industrial Pollution on environment	Registered motor vehicles per 1000 population and No. of Registered Factories

Table 2: Source of data of Selected Variables in Karnataka, 2001

Specification	Sources
Density of Population	Census of India 2001
Decadal Growth of Population (Percentage)	Census of India 2001
Percentage of Forest Area to Total Geographic Area	Directorate of Economics and Statistics, GoK
Percentage of Households using firewood as cooking fuel	Census of India 2001
Percentage of Agricultural Land to total geographical area	Directorate of Economics and Statistics, GoK
Usage of Fertilisers (kg/ha)	Directorate of Economics and Statistics, GoK
Registered motor vehicles per 1000 population	Directorate of Economics and Statistics, GoK
No. of Registered Factories	Directorate of Economics and Statistics, GoK
Human development Index	Karnataka Human development Report, 2005

The appropriate weightages have been assigned to all the considered eight variables of EDI using the method of categorisation. The individual Index of Pressure on environment calculated with the assigned weighted scores are added up to form EDI. The EDI thus calculated is transformed into standardised form.
i.e. Standardised EDI=((Real EDI Value of the District-Minimum Value))/((Maximum Value-Minimum Value))

$$\text{i.e. Standardised EDI} = \frac{(Real\ EDI\ Value\ of\ the\ District - Minimum\ Value)}{(Maximum\ Value - Minimum\ Value)}$$

As per EDI, Bangalore Urban, Bangalore Rural, Dharwad, Raichur, Mysore and Belgaum Districts have relatively high degree of environmental degradation. Bagalkot, Bijapur, Gadag, Chitradurga, Shimaga and Hassan shows relatively medium level of environmental degradation. Udupi, Kodagu, Chikmagalur, Chamarajnagara and Uttara Kannada districts have relatively low environmental degradation. As per the index, Bangalore suffers from the highest pressure from population on environment where as coastal districts shows relatively lower pressure from population. Interestingly, all the districts of North Karnataka region except Uttara Kannada shows high pressure on forest leading to forest degradation. Likewise, the pressure on environment from vehicular and industrial pollution is high in the districts of South Karnataka.

Sustainable Human Development Index

SHDI is calculated by modifying HDI in such a way as to include sustainability aspects of development in it. Such a modified index could better assess the real nature and extent of the human development process and the sustainability of such development process. Sustainable Human Development Index (SHDI) is simply calculated by deducting EDI from HDI as follows:

Sustainable Human Development Index = Human Development Index – Environmental Degradation Index

Table 3 provides the estimates of Sustainable Human Development Index for all the 27 districts of Karnataka.

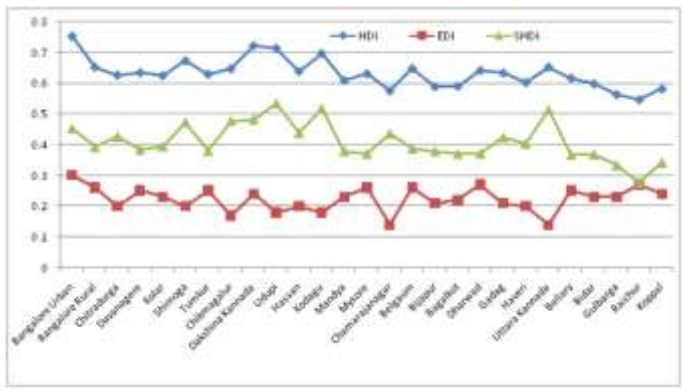
Table 3: District-wise Sustainable Human development Index (SHDI)

Sl. No.	District	HDI	EDI	SHDI=HDI-EDI	HDI Rank	SHDI Rank
1	Bangalore	0.753	0.30	0.453	1	7
2	Bangalore Rural	0.653	0.26	0.393	6	14
3	Chitradurga	0.627	0.20	0.427	16	10
4	Davanagere	0.635	0.25	0.385	12	16
5	Kolar	0.625	0.23	0.395	17	13
6	Shimoga	0.673	0.20	0.473	5	6
7	Tumkur	0.630	0.25	0.380	15	17
8	Chikmagalur	0.647	0.17	0.477	9	5
9	Dakshina Kannada	0.722	0.24	0.482	2	4
10	Udupi	0.714	0.18	0.534	3	1
11	Hassan	0.639	0.20	0.439	11	8
12	Kodagu	0.697	0.18	0.517	4	2
13	Mandya	0.609	0.23	0.379	19	18
14	Mysore	0.631	0.26	0.371	14	21
15	Chamarajanagar	0.576	0.14	0.436	25	9
16	Belgaum	0.648	0.26	0.388	8	15
17	Bijapur	0.589	0.21	0.379	23	18
18	Bagalkot	0.591	0.22	0.371	22	21
19	Dharwad	0.642	0.27	0.372	10	20
20	Gadag	0.634	0.21	0.424	13	11
21	Haveri	0.603	0.20	0.403	20	12
22	Uttara Kannada	0.653	0.14	0.513	7	3
23	Bellary	0.617	0.25	0.367	18	24
24	Bidar	0.599	0.23	0.369	21	23
25	Gulbarga	0.564	0.23	0.334	26	26
26	Raichur	0.547	0.27	0.277	27	27
27	Koppal	0.582	0.24	0.342	24	25

Source: HDI obtained from Karnataka Human development Report 2005 and SHDI computed.

The table shows that the districts such as Udupi, Kodagu, Uttara Kannada, Dakshina Kannada, Shimoga and Chikmagalur are above Bangalore Urban district mainly due to low environmental degradation. On the other hand, Bangalore Urban district has a high HDI (1st Rank) due to high district domestic product and high level of non poor population, but due to very high level of environmental degradation it ranks seventh in SHDI.

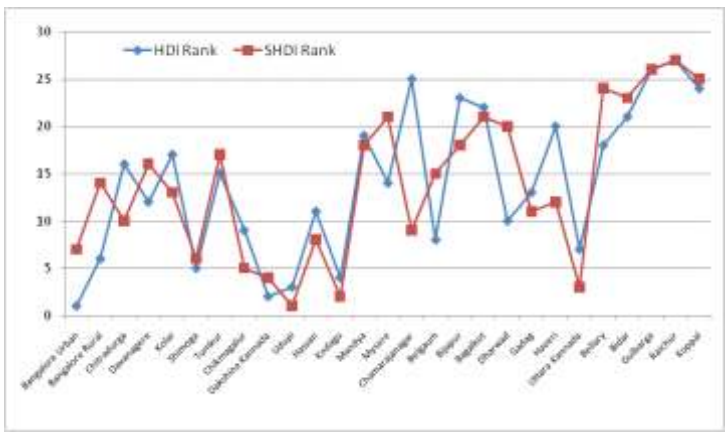
Figure 1: District-wise Sustainable Human development Index



The districts such as Koppal, Gulbarga and Raichur which are categorised under lowest HDI category fall also in the lowest SHDI category. The other districts which fall under low SHDI category are Bellary, Bidar, Dharwad and Bagalkot. Indeed these are the districts which are considered more vulnerable to climate disasters because of the low capacity to adapt. High levels of vulnerability and low adaptive capacity are linked by factors such as high poverty, low per capita income, high reliance on natural resources and lack of safety nets. Thus the SHDI value clearly depicts the coping capacity of the particular districts to environmental disasters.

The case of Chamarajnagar is interesting because it has relatively low level of HDI(25th rank), but because of its low environmental degradation index it is categorised under mid-SHDI districts (9th rank).

Figure 2: District-wise ranking of HDI and SHDI



Conclusion

The study point out that HDI alone doesn't reveal the sustainability aspects of human development. Further the study shows that environment and its management is inextricably linked with human development in terms of quantity and quality. Hence a comprehensive measure comprising environmental quality in human development framework is called for. This will ensure the use of natural resources which leads to sustainable incomes and consumption. Hence more attention needs to be to forest management and appropriate steps to avoid further deforestation. Also there is a need to implement stringent policies aiming at controlling industrial and vehicular pollution.

If no measures are taken, they will have an increasingly negative impact on quality of life and human well-being. Improving environmental sustainability cannot be achieved through environment policies alone. Human development strategies must explicitly consider the role of environment in enhancing people's choices.

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