

Demographic Change and the Environment

C M LAKSHMANA

Though there is a fair understanding of the ways in which India's population is changing as well as of the social and economic implications of these changes, little attention has so far been paid to its possible environmental impact. This article attempts to understand how the changing demographic trends have affected the environment and seeks to identify measures both to mitigate environmental damage as well as increase resource use efficiency.

C M Lakshmana (lakshmana@isec.ac.in) is with the Population Research Centre, Institute for Social and Economic Change, Bangalore.

India has 2.4% of the world's geographical area and is home to nearly 17% of the world's population. The demographic trends such as increase in the total population, changing age structure, change in household size, distribution and size of urban population across various segments, etc, have seriously affected the environment. Demographic trends are not uniform across the country with states like Bihar, Madhya Pradesh, Chhattisgarh, Uttar Pradesh, Odisha and Rajasthan witnessing above average growth rate and others experiencing a decline. This article attempts to understand the linkage of changing demographic trends and its potential environmental impact in India.

Demographic Change

Primarily, three important factors have emerged from the recent demographic change in India. They are: (a) people are living longer, (b) higher number of households with the average number of people per household being lower, and (c) the rate of population growth varies

across regions. Further, the country is now entering the final stage of demographic transition, already nearing replacement-level fertility in the southern states while the northern states of Punjab and Haryana have already reached this level. However, India exhibits one of the highest demographic heterogeneities ever experienced anywhere in the world at the regional and state levels. Despite the recent decline in the birth rate in the country it has recorded a growth rate of 1.6% per year during 2001–11, adding around 181 million people to the total, though the annual addition to the population has remained nearly the same (James 2011). However, there is a general consensus that demographic change in India has led to the opening up of new economic opportunities and has had a greater impact on the economy and society (Bloom and Williamson 1997). But at the same time the demographic changes such as size of population, household numbers, age structure of population, urbanisation, etc, are found to be important proximate causes for adverse impact on environment. Additionally, our current patterns of consumption such as the amount of energy and water use in homes, waste generation, changing landscape and biodiversity loss are going to have a greater impact on the environment than all the above demographic factors.

The increase in life expectancy — an important driver contributing to increase in population — and the consequent growth in the number of older people are likely to continue in India. This calls for timely action to ward off the social and economic consequences of an ageing population. For instance, the UK has already taken precautionary measures to mitigate the potential impact on the environment of this phenomena. In this regard, the Royal Commission on Environmental Pollution in the UK has found that if people have more years of active life it will potentially have a greater environmental impact. Older people and particularly those over the age of 75, on an average, contribute disproportionately to carbon emissions due to the heating of their homes, etc. This is because they spend a greater amount of time at home and feel the cold more intensely. Further, there is a growing body of evidence to show that the potential environmental impact of residues of pharmaceuticals released into the environment by excretion or disposal particularly by the elderly is greater as they use more medicines than younger people. And now a similar situation is evident in India. For example, as per the 2001 Census India had 49.10 million people in the 65+ age group which increased to 90 million (7.43%) in 2011. And by 2050, their number is expected to reach 315

million, constituting about 20% of the total population.

Changing Household Structure and Energy Use

It is widely assumed that, in general, smaller size households make higher energy use and result in higher CO₂ emissions per head. The data collected and conclusions reached as part of the integrated impact assessment of the London Housing Strategy by the Royal Commission on Environmental Pollution (2011) in the UK has found that larger households consume proportionately fewer resources than the smaller ones, with a three-person household using only about twice (rather than three times) the water used in a one-person household. Hence, household size is one of the factors which contribute to the amount of water consumed per head. A similar trend was also observed in India (UN 1999; NCAER 2011). Electricity use, gas use and waste generation show quantitatively the same trends not only in the UK but also in other countries like the US, China and India (Lakshmana 2009). Although the changing demographic trends have led to a reduction in the size of the family, the nuclear family¹ is the common tendency in India.

Reduction in family size naturally increases household income leading to less number of dependents and more

money available for savings, investments and consumption. Besides, demographic change has led to the preponderance of young and working-age population in the country. Population in the 15-29 age group is growing at a faster rate than the other age-groups (Census of India 2011). This has led to two important developments: (1) the proportion of those joining the labour force and earned wage/salary has increased manifold; and (2) the joint family system² is losing ground and nuclear families are gaining ground (Census of India 2011). Therefore, increased per capita expenditure at the household level has been leading to acquisition of household assets like cars, refrigerators, etc, which consume enormous quantities of energy on the one hand, and release carbon and other pollutants on the other. Now the burgeoning middle class in Asia, particularly in China and India, is consuming energy that is more or less equal to the US energy consumption (UN 1999; NCAER 2011). The demand for new housing and related development as a result of demographic change will increasingly come up against environmental constraints in all parts of the country.

As per the 2011 Census, India has 24.66 million households as against 19.19 million in the previous Census (2001). The overall increase in the growth rate of total households during this decade is 29% of which urban areas account for

75% Discount

EPW Research Foundation

(A UNIT OF SAMEEKSHA TRUST)

The following Publications of EPWRF are being sold at 75% of discount on their original price.

Name of Publications	Price* (net of discount, INR)
Annual Survey of Industries 1973-74 to 1997-98 (Hard Cover, 1200 pages)	300
Domestic Product of States of India: Vol.II (1960-61 to 2006-07) (Paper Back, 520 pages)	200
Household Savings and Investment Behaviour in India (Paper Back, 250 pages)	150
District-wise Agricultural Data Base for Maharashtra: 1960-61 to 1997-98 (Hard Cover, 1525 pages)	500

* Please add extra Rs. 150/- for Postal/Courier charges per copy. Demand Draft/Cheque favouring EPW Research Foundation, payable at Mumbai may be sent to: **The Director, EPW Research Foundation**
C-212, Akurli Industrial Estate, Akurli Road, Kandivli (E), Mumbai – 400 101.
Phones: (022) 2885 4995/ 4996 Fax: (022) 2887 3038 E-Mail : admin@epwrf.res.in

over 50%. The percentage of nuclear families in India increased from 61% in 2001 to 68% in 2011. The total reduction in fertility rate of 0.71% (3.39% in 1991 and 2.68% in 2005) has resulted in an increase of about 8% in the number of nuclear families over 15 years. The reduction in fertility rate is found to be faster in rural areas than in the urban areas. While a reduction in fertility has led to a decline in population growth, it has also led to an increase in nuclear families with fewer members per household.

Increasing household income has resulted in the acquisition of electronic goods and motor vehicles by individuals. The socio-economic transformation in the context of technological change has been accompanied by huge acquisition of television sets, computers, cell phones and automobiles across urban and rural areas. Interestingly, the percentage of households that do not have such household goods decreased from 34.5% in 2001 to 17.8% in 2011. According to the latest (2013) report by the Planning Commission, Government of India, this is exactly equal to the proportion of population below poverty line (BPL). This confirms that the drastic decline of fertility in most parts of the country (except perhaps in the backward states) has consequent increase in disposable per capita income and has empowered individuals to acquire household assets like automobiles and electronic goods extensively. There is a need to address the emerging issues of population and development in general and seek answers to the question whether demographic change in terms of fertility decline is a dividend or a disaster in terms of its adverse effect on the environment.

The Effects of Urbanisation

During the post-liberalisation period, India has witnessed a rural influx into urban areas (Lakshmana 2010). This has put tremendous pressure on fertile land and resulted in resource depletion and environmental pollution. The most striking feature of India's urbanisation is that it is "large-city oriented" and almost 70% of India's urban population is now concentrated in class I cities (Lakshmana 2008). The poor quality of India's urban centres and the consequent haphazard

Table 1: Most Populous Cities and Their Population by Region

Region	Number of Cities	Population (in millions) 2001	Percentage	2011	Percentage	Proportion of Urban Area to the Total Urban Area	Man-Land Ratios Per sq kms
North	28	24.61	17.90	31.65	18.03	14.00	2,893
Central	46	27.28	19.85	34.62	19.72	23.00	1,926
East	32	16.36	11.90	19.93	11.35	10.14	2,516
North East	3	1.25	0.91	1.56	0.89	3.18	629
West	36	39.91	29.04	55.01	31.33	16.76	4,200
South	47	30.22	21.99	35.13	20.01	32.92	1,365
India	192	137.45	100.00	175.57	100	100.00	2,246

Source: Compiled by the author from Census data.

kind of urbanisation has been worsened by the burden of this rural influx. The magnitude of environmental degradation in such urban sprawls is alarming (Lakshmana 2010). However, increased urban population over the past 30 years is of greater significance in the western region compared with other regions in India. Besides, the western region has the highest number of most populous cities with only 16.76% of the total land area, and double the proportion of population, i.e., 31.33% of the total (Table 1). Similarly, the northern region with 14% of land area had 18% of population in the same time span. This means that the most populous cities are located in the western and northern regions, and therefore one can conclude that urban growth and urbanisation has led to increased use of natural resources; as a result, environmental pollution could be expected to be higher in the western and northern cities. While the determinants of population growth such as birth rate, death rate, etc, have declined over time, migration seems to have neutralised the expected advantages, as evidenced by the fact that there has not been any decline in the rate of resource use and consequent environmental decay.

Conclusions

The current patterns of consumption in India have a greater impact on the environment than all the above demographic factors. Therefore, demographic trends not only imply significant social and economic issues but also potential impact on the environment. Thus, meaningful efforts need to be made to increase resource use efficiency to protect the environment. At the same time, the rapid change in age structure and resultant increase in the number of nuclear families, demands for new housing and

related development will increase despite inherent environmental constraints in most regions of the country. Remedial measures need to be taken to reduce the consumption level and waste generation by individuals and households in order to protect the environment. Until the government pays adequate attention to the implications of demographic change for the environment, the country will not be able to face the challenge of environmental decay and the related human issues in the coming decades.

NOTES

- 1 A nuclear family is a family unit that consists of father, mother, and children.
- 2 A family includes in one household near relatives in addition to a nuclear family or a family that includes not only parents and children but also other relatives (such as grandparents, aunts and uncles: (An Encyclopaedia, Britannica Company).

REFERENCES

- Bloom, D E and J G Williamson (1997): "Demographic Transition and Economic Miracles in Emerging Asia," Working Paper 6268, Cambridge, MA, NBER.
- James, K S (2011): "India's Demographic Change: Opportunities and Challenges," *Science Journal*, 333: 576-80.
- Lakshmana, C M (2009): "Effects of Population Growth on Environmental Degradation: With Reference to India," *Demography India*, 37(1): 63-79.
- (2010): "Effects of Population Growth on Environment in India" in Lahiri, Paswan and Das et al, *Migration, Health and Environment*, Mumbai: IIPS, Jaipur: Rawat Publications.
- (2013): "Population, Development and Environment in India," *Chinese Journal of Population Resources and Environment*, London, UK: Taylor & Francis, Vol 11, No 4, pp 367-74.
- NCAER (2011): "Report on Middle Class Population," National Council of Applied Economic Research, New Delhi.
- Registrar General and Census Commissioner of India: Tables on Houses, Amenities and Assets of Census 2001 and 2011.
- The Royal Commission on Environmental Pollution (2011): "The 29th Report of Demographic Change and the Environment," United Kingdom, London.
- United Nations (1999): "The Landmark Report of the World Commission on Environment and Development", United Nations Development of Economic and Social Affairs (DESA), US.