SCIENCE EDUCATION AND SUSTAINABLE DEVELOPMENT

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Often people think that the problems which pertain to the environmental issues such as climate change, global warming, ozone depletion, different type pollutions, deforestation, biodiversity loss are to be solved by government or scientists of the world. However, we need to realise that these issues are emerging due to the activities and exploitation of natural resources by the human being. Thus each of us is involved in creating or enhancing these problems as part of the problems. The time has come to take necessary measures to save our future. We should understand the reasons and factors that are responsible for these issues. This paper critically analyses the factors causing environmental issues— imbalance, disturbance like climate change, global warming, ozone depletion, different types of pollutions, biodiversity loss, etc.

Key words: *Science education, sustainable development, environmental issues*

Introduction

Our environment is getting disturbed adversely by the human activities including rapid growth of industries and depletion of the natural resources. For the sustainable development of our environment only science education can provide the crucial solution to address the environmental issues and concerns. For this our target age group should be 5 to 30 years representing the young population of the country. The target population should be oriented in such way that they are aware about the problems which are emerging day by day, such as, high population, biodiversity loss, global warming, ozone depletion and different types of pollutions. The target population can understand and correlate the issues by science education and they may adopt alternatives and make efforts to reduce factors which cause all the problems.

Let us check the data presented in the following tables.

Table 1

Population Growth of India per Decade

Census Year	Population	Change (%)
1951	361,088,000	–
1961	439,235,000	21.6
1971	548,160,000	24.8
1981	683,329,000	24.7
1991	846,387,888	23.9
2001	1,028,737,436	21.5
2011	1,210,726,932	17.7

Source: Hosamane and Desai (2013)

As evident from the above data, the population is growing alarmingly in India and it is causing a lot of environmental issues such as; deforestation; drinking water crises; urbanisation; waste management; excess use of fossil fuel; climate change; Loss of biodiversity; and global warming.

The biodiversity status of India as in 2009 is presented in Table 2 below.

Table 2

Biodiversity Status of India

Group	Estimated number of species	Rank amongst mega diverse countries
Higher plants	18664	IX
Mammals	390	VII
Birds	458	IX
Reptiles	521	V
Amphibians	231	IX
Fish	5749	I

Source: *India's Fourth National Report to the Conservation on Biological Diversity (2009)*

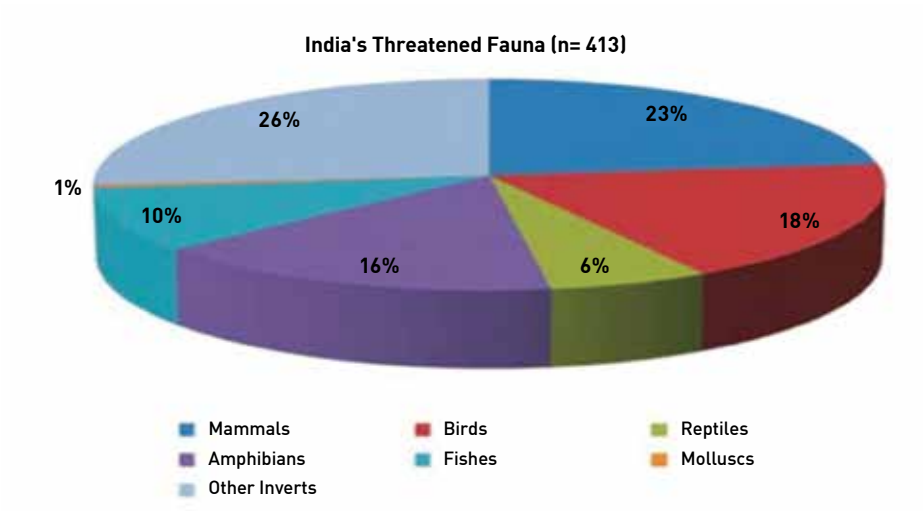

Fig. 1. India's Threatened Fauna

Dicliptera abuensis

Indian Vulture

Great Indian Bustard

One Horned Rhinoceros

Fig. 2. Some of the endangered species in India

Pollution—a serious concern: With rapid growth of population, industrialisation and other changes in life style of people the quality of air is deteriorated and it has reached at dangerous levels in some of the cities like Delhi. Table 3, presents the pollution level classification of air.

Table 3

National Ambient Air Quality Standard (NAAQS)–Pollution Level Classification

Pollution level	Annual Mean Concentration Range (ug/m^3)					
	Industrial, Residential, Rural and other areas			Ecologically Sensitive Area		
	SO_2	NO_2	RSPM	SO_2	NO_2	RSPM
Low	0-25	0-20	0-30	0-10	0-15	0-30
Moderate	26-50	21-40	31-60	11-20	16-30	31-60
High	51-75	41-60	61-90	21-30	31-45	61-90
Critical	→75	→60	→90	→30	→45	→90

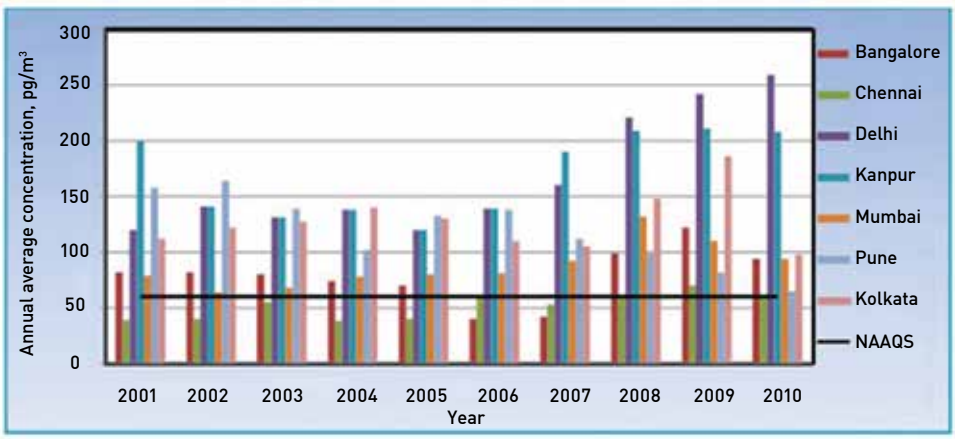

Fig. 3. Concentration of RSPM in residential and industrial areas in major cities

Discussion

- The National Capital Territory of Delhi is concerned with air pollution and public health. The pollution issue of Delhi has been in focus among the national as well as international media.
- Organisations like Centre for Science and Environment (CSE) and Indian Council of Medical Science (ICMR) have given data for air pollution. The report said air pollution is coming out as one of the key sources of growing diseases among the people in Delhi.
- The main sources of air pollution are dust, soot, fly ash, diesel exhaust particles, and gases like nitrogen dioxide, sulphur dioxide, etc.
- The people of the national capital have suffered so many problems like asthma, burning in eyes, inflammation of mucus membranes and skin. The problems are day by day increasing. In recent years due to high pollution and fog the government had to close public as well as private schools.
- The temperature of our environment is continuously increasing and the weather has become unpredictable nowadays. The concentration of green house gases in the environment has been increased, that is why the temperature of our environment is increasing.
- In most of our big cities, the temperature has crossed over 40°C. Phalodi and Churu in Rajasthan had recorded a maximum temperature above 50°C. Figure 4 presents the temperature of some places in India on 25 May 2016 at 03:43 PM.

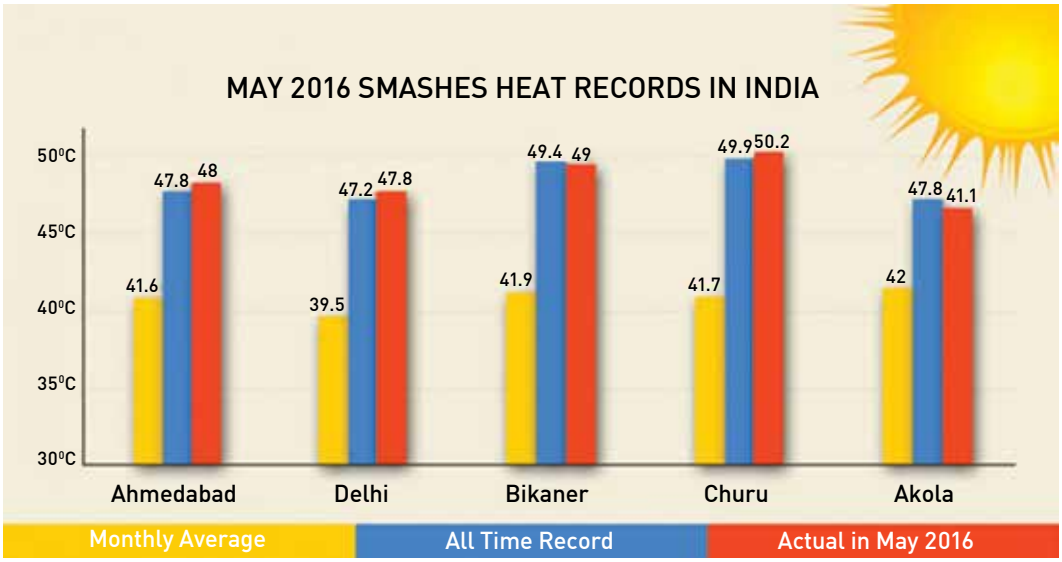

Fig. 4. Temperature recorded on 25 May 2016 at Ahmedabad, Delhi, etc.
accessed from ©Skymet Weather Sciences Pvt. Ltd. 2016

Importance of ozone layer: The ozone layer of the atmosphere is found approximately 15 to 40 km above earth. It absorbs harmful ultra violet rays of sun that can damage the genetic materials in living cells . Hence ozone layer acts as an umbrella of the earth.

Conclusion

To overcome these problems, our education policies should be such that we create an environmentally conscious society by inculcating the scientific temperament among children. This paper presents an overview of the emerging scenario and the critical observations and comments on the various data collected by the environmental and scientific organisations. An effort has also been made to correlate the data with the health related problems in human beings. It is also recommended that the data, its interpretation and discussion should be included in the course curriculum of science at the school level so that scientifically informed and environmentally conscious future citizens are developed in schools. Such an effort will be helpful in understanding the science for sustainable development.

References

Census Report. 2011. Population Assessment of India.

Hosamane, N.S. and G.P. Desai. 2013. Urban Air Pollution Trend in India— Present Scenario. *Int. J. Inno. Res. Sci., Engg. & Tec.* Vol. 2, No. 8. pp. 3738–3747.

Government of India, 2009. India's Forth National Report to the Conservation on Biological Diversity. Ministry of Environment and Forest, New Delhi.

https://facultystaff.richmond.edu/~sabrash/110/The%20Ozone%20Layer.ppt education.jlab.org/jsat/ powerpoint/0708_global_warming.ppt