

# ENVIRONMENTAL AND SCIENCE COMMUNICATION

**M.A (Journalism and Mass Communication)**

**Semester – IV, Paper-III**

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# **M.A (JMC): Environmental and Science Communication**

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## **FOREWORD**

*Since its establishment in 1976, Acharya Nagarjuna University has been forging ahead in the path of progress and dynamism, offering a variety of courses and research contributions. I am extremely happy that by gaining 'A' grade from the NAAC in the year 2016, Acharya Nagarjuna University is offering educational opportunities at the UG, PG levels apart from research degrees to students from over 443 affiliated colleges spread over the two districts of Guntur and Prakasam.*

*The University has also started the Centre for Distance Education in 2003-04 with the aim of taking higher education to the door step of all the sectors of the society. The centre will be a great help to those who cannot join in colleges, those who cannot afford the exorbitant fees as regular students, and even to housewives desirous of pursuing higher studies. Acharya Nagarjuna University has started offering B.A., and B.Com courses at the Degree level and M.A., M.Com., M.Sc., M.B.A., and L.L.M., courses at the PG level from the academic year 2003-2004 onwards.*

*To facilitate easier understanding by students studying through the distance mode, these self-instruction materials have been prepared by eminent and experienced teachers. The lessons have been drafted with great care and expertise in the stipulated time by these teachers. Constructive ideas and scholarly suggestions are welcome from students and teachers involved respectively. Such ideas will be incorporated for the greater efficacy of this distance mode of education. For clarification of doubts and feedback, weekly classes and contact classes will be arranged at the UG and PG levels respectively.*

*It is my aim that students getting higher education through the Centre for Distance Education should improve their qualification, have better employment opportunities and in turn be part of country's progress. It is my fond desire that in the years to come, the Centre for Distance Education will go from strength to strength in the form of new courses and by catering to larger number of people. My congratulations to all the Directors, Academic Coordinators, Editors and Lesson- writers of the Centre who have helped in these endeavors.*

**Prof. Raja Sekhar Patteti**  
Vice-Chancellor  
Acharya Nagarjuna University

**M.A (Journalism and Mass Communication)**  
**Semester – IV, Paper - III**  
**403JM21 -ENVIRONMENTAL AND SCIENCE COMMUNICATION**

**SYLLABUS**

**Unit-1**

Environmental communication –nature, scope, and definition - Global environmentalism - environmental movements in India - Media and environmental journalism.

**Unit-2**

Environment-causes and factors of environmental pollution, constitutional and legal provisions in India. Environmental acts. Earth summits, UN and climate change. Citizen's communication and public participation. Criticisms of traditional forms of public participation- the emergence of alternative forms of public participation.

**Unit-3**

Media coverage of environment. News production, political economy, gate keeping, objectivity, and balance, agenda setting. Rise of alternative environmental media – newspapers, films, professional societies for environmental journalists, environmental advocacy, case studies, dilemmas of environmental advocacy- green marketing and corporate campaign

**Unit-4**

Science communication-definition-nature-scope and need. History of science communication, key elements. Science communication and development, introduction to science writing in media, expanding fields for science writing, news and science story writing.

**Unit-5**

Scientific temperament –science convention- three principles of usefulness, science reporting radio, newspapers, magazines TV – communication for health and medicine. Science and censorship-safe guarding the future.

**Suggested reading:**

- 1.JVVilani (1993) : Science Communication and Development, Sage Publishers, New Delhi.
- 2.DW Burkett (1973): Writing Science News for the Mass Media, Gulf Publishing Company, Redas, Texas, USA
3. Pamela Creedon, Women Mass Communications
4. Charlotte Krolokke, & Annie Scott Sorensen (2005), Gender Communication : Theories and Analysis, Sage Publications.
5. H.O. Aggarwal (2000), International Law and Human Rights, Central Law Publications, Allahabad.
6. N.J. Wheeler & Tomothy Dunne (1999), Human Rights in Global Politics, Oxford, London.
7. Robert Cox (2006), Environmental Communication and Public Sphere, Sage, London
8. L. Wallack, et.al. Media Advocacy and Public Health, Sage, London

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# LESSON - 1

## BASICS OF ENVIRONMENTAL COMMUNICATION

### OBJECTIVES

After completing this chapter, you should be able to:

1. Define environmental communication;
2. Enumerate some core messages of environmental communication;
3. Name the essentials of environmental communication; and
4. Describe the importance of communication in environmental protection.

### Structure

- 1.1. Introduction**
- 1.2. Definitions**
- 1.3. Scope and Importance**
- 1.4. Essentials**
- 1.5. Environmental communication serves two different functions**
- 1.6. Ways of Studying Environmental Communication**
- 1.7. Diverse Environmental Voices in the Public Sphere**
- 1.8. Summary**
- 1.9. Technical Terms**
- 1.10. Self-Assessment**
- 1.11. Suggested Readings**

### 1.1. INTRODUCTION

Environmentalism as we know it today began with environmental communication. The environmental movement was ignited by a spark from a writer's pen, or more accurately, Rachel Carson's typewriter. The publication of Carson's *Silent Springs* in 1962 marked the beginning of the environmental crusade that has been and is still being carried out by two generations of baby boomers and post-baby boomers. Indeed, Carson was a biologist. But, as *Time Magazine* put it, she was first and foremost a writer.

Communication is nothing more than the exchange of information. Hence, in its broadest sense, environmental communication is necessary for the survival of every living system, be it an organism, an ecosystem, or a social system. Communication as Symbolic Action: Wolves.

Earlier, we defined environmental communication as a form of symbolic action. Whether considered as pragmatic or constitutive functions, our symbolic acts do something. Films, websites, apps, photographs, popular magazines, and other forms of human symbolic behaviour are produced by us and act on us.

Environmental communication is the dissemination of information and the implementation of communication practices that are related to the environment. In the beginning, environmental communication was a narrow area of communication; however,

nowadays, it is a broad field that includes research and practices regarding how different actors (e.g., institutions, states, people) interact with regard to topics related to the environment and how cultural products influence society toward environmental issues. As a result, environmental communication is complex, involving verbal, nonverbal, personal, interpersonal, and visual communication.

Due to global environmental issues such as climate change, new communication initiatives to promote environmental policies and affairs have emerged. Groups such as international organizations, states, and the United Nations (UN) use such initiatives in an attempt to change the way individuals think about the environment.

This entry traces the evolution of environmental communication and its subfields of study. In addition, it explores several important environmental problems of today's society and reveals correlations among companies, mass communications, new technologies, and the public.

## 1.2. DEFINITIONS

The word 'environment' is derived from the French word 'environner' which means "to encircle or surround." It is a composite word for the conditions/surroundings in which an organism or group of organisms live. The environment is a very wide term. It includes the total physical and biotic world, in which biological beings live, grow, get nourished, and develop their natural characteristics. In other words, it concerns the "Biosphere" which includes all biotic parts of the hydrosphere, lithosphere, and atmosphere. The environment consists of both biotic and abiotic substances, i.e., consists of air water, food, sunlight, temperature, electricity, etc. Thus, environment can be defined in a number of ways, but a common definition is

"Environment is the sum of all social, economic biological, physical or chemical factors which constitute the surroundings of men/living organism, who is both creator and moulder of this environment."

The environment for any living organism is always been changing never constant or static. This change is sometimes slow, sometimes rapid or so. Some of these changes are irreversible (e.g., eutrophication of lake) while others are cyclic (e.g., the annual climatic cycle) or transient (i.e., droughts). Now because the natural bio geographical environment fluctuates with time, it is not easy to distinguish change brought about by man.

Like other organisms, man is also affected by the environment. These changes in the environment may benefit or harm the man or other organisms living in it. Environmental science is a multidisciplinary branch of science involving, chemistry, physics, life science, agriculture public health, botany, medical sciences, geography, and many other fields. Environmental science or studies is the study of the characteristics, composition functions, and systematic study of different components of the natural environmental systems. The environment includes both physical and Non-living (abiotic) and living (biotic) environments. Economics, sociology, education, and mass- communication do help in understanding the socio-economic aspects of the environment. Mathematics, statistics, and computer science also help in modelling and management of the environment.

With increasing scientific knowledge, man is able to modify the environment to suit his immediate needs much more than any other organism. Since the very beginning of human civilization, man started interfering with the environment. He devastated forests for the use of trees as wood, and land under cultivation. He had polluted the rivers and other water resources. The traditional concept that, natural resources are abundant for man to use or abuse has been responsible for the massive degeneration of nature, natural systems, environment, and wildlife. The natural systems in which man exists along with all other species must be maintained in a healthy and functional state.

Environmental science is, therefore, a multidisciplinary science, which may require the attention of experts from different branches of science when decisions regarding environmental matters have to be taken. In industrialized developing countries of the world, India occupies 7th place. India has good industrial infrastructure in several industries like chemical, power, nuclear energy, food, petroleum, pesticides, insecticides, plastic etc. A number of industrial effluents and emissions, especially toxic gases are spewed into the air daily. A rapid increase in atomic and nuclear energy has added a huge number of radioactive substances to the atmosphere. Thus, the environment deteriorates to such an extent that it has crossed the critical limit and has become lethal to all organisms, including men.

The craze of progress in agriculture, industry, transportation, and technology is taken as the general criterion of development of any nation. Such activities of man have created adverse effects on all living organisms in the biosphere. Today environment has become foul, contaminated, undesirable, and therefore, harmful to the health of living organisms (including man). So, for as pollution is concerned, the environment includes the air, the water, the soil, the noise, the buildings, the landscapes, the oceans, the lakes, the rivers, the parks, the vehicles, and many other things. Not only additions of constituents in these adversely alter the natural quality of the environment but also removal of constituents causes pollution.

Environmental communication as a field began in the United States around the 1980s. It is related to rhetorical theory, as the pioneer researchers in the field implemented rhetorical practices to raise environmental awareness and to investigate environmental organizations as well as the tensions surrounding environmental topics such as endangered species, forests, and nature in general.

Many scholars credit Christine Oravec's 1981 article "John Muir, Yosemite, and the Sublime Response: A Study in the Rhetoric of Preservationism" as the first study in the field. Not only did Oravec's study attract the interest of the scientific community, but also it broadened environmental communication as scientists began to examine the role of media products, the consequences of human activities in relation to the environment, and the risks of public health. In addition, studies that focused on the public relations strategies of important environmental events such as the 1986 Chernobyl nuclear disaster were conducted.

Today, the field of environmental communication is recognized by many prominent scholarly journalism and communication associations. One such organization that aims to promote the field of environmental communication is the International Environmental Communication Association, which was founded in 2011. Throughout the world, numerous associations and organizations focus on promoting environmental communication. Even transnational state organizations and nations take action in favour of the environment and raise awareness about environmental issues. For instance, in 2013, the European Commission



released the EU Adaptation Strategy regarding climate change. This strategy provided members of the European Union with objectives in order to become more resilient to climate change.

Moreover, during the last month of 2015, 196 members of the UN Framework Convention on Climate Change agreed to accept the so-called Paris Agreement. Its main goal was to address global warming by limiting global temperature rise to 1.5 °C above preindustrial levels. Although the agreement has been characterized as a breakthrough for environmental issues, to date, there is no clear evidence of its success. Lastly, at the end of 2015, the General Assembly of the UN adopted the 2030 Agenda for Sustainable Development, with some of the 17 sustainable development goals aimed at improving the environment.

In the past decade, there has been a general agreement among environmental communication practitioners that their core messages correspond to the four laws of ecology enumerated by the noted American biologist, Barry Commoner in his book *The Closing Circle*. These four laws are as follows:

“Everything is connected to everything else.” This law pertains to the systems theory concept of interconnectedness. Everything within an ecosystem is interrelated and interconnected like a giant web. Extending this to the entire ecosphere, we have the Web of Life. Harming one part of this web brings consequences to the other parts.

“Everything must go somewhere.” Commoner’s second law pertains to waste and its management. Waste becomes part of our environment. It cannot be discarded in the strictest sense of the word. Although it may not end up in your own backyard, it will always end up somewhere.

“Nature knows best.” Technology cannot solve all the problems of society. In fact, it may be the cause of some of these problems. Nature has its own way of compensating for inequities, keeping the equilibrium, and solving problems.

“There is no such thing as a free lunch.” Every gain has its costs. Exploiting our natural resources comes with a price. At times, that price is higher than the benefit we get.

### **1.3. SCOPE AND IMPORTANCE**

The environment consists of all living and non-living things which surround us. Therefore, the basic components of the environment are-

1. Atmosphere or the air
2. Hydrosphere or the water
3. Lithosphere or the rocks and soil
4. The biosphere

Environment influences and shapes our lives. It is from the environment that we get food to eat, water to drink, air to breathe and all necessities of day-to-day life are available from our environment. Thus, it is the life support system. Hence the scope & importance of the environment can be well understood the basic concepts of environmental studies are

interesting and important too not only to the scientists engaged in various fields of science and technology but also to the personnel involved in resource planning and material management. It is now universally realized that any future developmental activities have to be viewed in the light of their ultimate environmental impact. The tremendous increase in industrial activity during the last few decades and the release of obnoxious industrial wastes into the environment have been a considerable concern in recent years from the point of view of environmental pollution. Environmental pollution on the one hand and deforestation, soil erosion, population explosion, and global warming interference in the ecosystem and biosphere on the other are threatening the very existence of life on the earth.

According to Jantsch 1970 environmental science attempts to solve major environmental problems with the help of interdisciplinary and trans disciplinary approaches i.e., the entire knowledge of all the disciplines of science such as Maths, Physics, Chemistry, Biology, Geology, Geography, Computer Science, Medical Science, and Biotechnology, as well as of social sciences such as Economics Sociology and Psychology environment science is a subject which draws heavily from environmental biology but depends more on France disciplinary approach.

#### **1.4. ESSENTIALS**

Based on the experiences of two generations, the following traits are necessary in the practice of environmental communication:

Knowledge of ecological laws. The environmental communication practitioner should be familiar with the four laws of ecology as enumerated by Barry Commoner. These so-called informal laws were presented by the Commoner in a non-technical manner and would be easily understood by the layperson. Furthermore, most if not all of the messages in environmental communication would fall under any of these laws.

Sensitivity to the cultural dimension. Although some people believe that nature and culture are two irreconcilable dichotomies, many environmentalists consider nature and culture as a continuum. Nature and culture actually co-evolve. One of the best strategies of environmental communication is to tap indigenous or popular media. Hence, the environmental communication practitioner should be sensitive to the cultural dimension, not merely the technical aspect of environmental management and protection.

Ability to network effectively. Environmental communication occasionally takes on an advocacy role. Networking is essential in advocacy.

Efficiency in using media for social agenda setting. Media sets social agendas. An environmental communication practitioner should not only be aware of this. He should be adept at setting the environmental agenda by using the media.

Appreciation and Practice of Environmental Ethics. The complexity and involvement that characterize environmental communication make it imperative for us to practice what we preach. Who would believe us if we do not “walk the talk.” Walking the talk comes naturally once an individual internalizes environmental ethics. It has five essentials:

1. Knowledge of ecological laws
2. Sensitivity to the cultural dimension

3. Ability to network effectively
4. Efficiency in using media for social agenda-setting
5. Conflict resolution, mediation, and arbitration

Environmental communication may take the form of communication campaigns. On the other hand, it may tap indigenous or popular media.

### **1.5. ENVIRONMENTAL COMMUNICATION SERVES TWO DIFFERENT FUNCTIONS:**

1. Environmental communication is pragmatic: It consists of verbal and nonverbal modes of interaction that convey an instrumental purpose. Pragmatic communication greets, informs, demands, promises, requests, educates, alerts, persuades, rejects, and more. For example, a pragmatic function of communication occurs when an environmental organization educates its supporters and rallies public support for protecting a wilderness area or when the electric utility industry attempts to change public perceptions of coal with TV ads promoting "clean coal" as an energy source. "Buy this shampoo" or "Vote for this candidate" are explicit verbal pragmatic appeals.
2. Environmental communication is constitutive: It entails verbal and nonverbal modes of interaction that shape, orient, and negotiate meaning, values, and relationships. Constitutive communication invites a particular perspective, evokes certain beliefs and feelings (and not others), fosters particular ways of relating to others, and thus creates palpable feelings that may move us. Let's illustrate this a little further.

University of Cincinnati Professor Stephen Depoe invites his students reading this textbook to Tweet examples of functions of environmental communication. In 2016, one student, @SornKelly, tweeted an image of a glass filled halfway with water, with the words half empty on one side and the words half full on the other. This classic English expression is a wonderful way to think about constitutive communication. By naming the same glass "empty" or "full," we are not only describing what we perceive and wish others to perceive; we are also defining the object in a way that imbues an entire attitude. Consider, for example, whether you have a half-empty or half-full attitude about climate change: How does that shape everything from your attitude in everyday life to which politicians garner your vote?

Constitutive communication, therefore, can have profound effects on when we do or do not define certain subjects as "problems." When climate scientists call our attention to "tipping points," they are naming thresholds beyond which warming "could trigger a runaway thaw of Greenland's ice sheet and other abrupt shifts such as a dieback of the Amazon rainforest" (Doyle, 2008). Such communication orients our consciousness of the possibility of an abrupt shift in climate and its effects; it, therefore, constitutes, or raises, this possibility as a subject for our understanding as opposed to being simply another number to signify carbon levels.

### **1.6. WAYS OF STUDYING ENVIRONMENTAL COMMUNICATION**

Since the 1980s, environmental communication has proliferated as a professional field. Associated with such disciplines as communication, media, journalism, and information, it has emerged as a broad and vibrant area of study. Pezzullo (2017) has identified seven general approaches existing today:

1. Environmental communication research focused on environmental personal identity and interpersonal relationships may involve assessing one's ecological footprint, auto ethnography, consumption studies, and a sense of self-in-place (Cantrill,1998). Environmental education practices, or studying groups' environmental attitudes and practices. This approach might also focus on intercultural distinctions and dialogues, such as varying perspectives on discourses of dwelling (Carbaugh&Cerulli,2012) or ways of engaging the nonhuman (Salvador & Clarke,2011). Although the emphasis of this book is on interactions in the public sphere, we hope that bringing in our own stories and inviting you to act locally will help open up opportunities for you to make connections between personal and public life.
2. Environmental organizational communication studies inquire how certain institutions or networks talk about or organize environmental matters. This area explores the hierarchal language, stories, rituals, roles, and/or rules of environmental and anti-environmental discourse affecting both our public and our everyday lives. Notable research includes, for example, scholarship on the discourses surrounding the U.S. government's production of nuclear energy, secrecy around those practices, and debates over the disposal of nuclear waste (Taylor, Kinsella, Depoe, & Metzler, 2007).
3. Environmental science, technology, and health communication explore a range of subjects, from personal choices about technology and interpersonal communication in labs and hospital rooms to risk assessments of environmental policymakers. These approaches focus less on public and popular discourses and more on personal or technical discourse communities, such as doctor-patient interactions, public health campaigns, and how scientists may communicate more effectively with the public. Some of this scholarship values structural critique, such as Mohan Dutta's (2015) compelling communication research in Southeast Asia on how subaltern communities can embrace a culture-cantered approach to public health decisions related to agriculture.
4. Public participation in environmental decision-making draws on rhetoric, discourse studies, and organizational communication and reflects a commitment to democracy. Practices, principally ways to resolve or navigate controversies over public goods and the commons. When a protest has not been successful or is desired to be avoided, studies of public participation inquire about the ways in which various stakeholders (for example, loggers, forest activists, and businesses) contribute to decisions about environmental policies and projects; studies include the diverse voices and interactions (verbal and nonverbal) that shape choices, such as management of a community's water supply (Sprain, Carcassonne, & Merolla, 2014).
5. Environmental mass media studies have become popular at a time when climate scientists increasingly are eager to reach broader audiences. Drawing more on a social scientific perspective, this approach includes discourse analysis of mainstream news coverage of environmental topics, studies of the social construction and/or framing of the environment in the media, visual green brands, and environmental media effects, including framing, cultivation analysis, and narrative analysis (Boykoff, 2007; Carvalho & Peterson, 2012).
6. Green applied media and arts is a broad umbrella term for those environmental practitioners and scholars who focus on production: in a specific medium, its circulation, its intermediation, and/or technology-based arts (including photo imaging, video, digital designs, sound, and live performance). This category may focus on environmental journalism, public relations, green design, environmental architecture,

and more. Green applied media and arts could involve, for example, how environmental journalists are moving from a primarily print form to digital and social media platforms, such as producing or linking to a documentary short within a story. Green arts might also involve community poetry slam performances to raise awareness about farmworker lives in the global South or environmental scientists and artists who work collaboratively to raise awareness through exhibits in public spaces.

7. Environmental rhetoric and cultural studies bridge fiction and nonfiction; individual and collective expression; verbal and nonverbal interactions; communication face-to-face or face-to-screen; concerns for meaning, materiality, and affect; and more. Rhetoric and cultural studies primarily may involve analysis of a range of communicative phenomena- language, discourse, visual texts, popular culture, place, environmental advocacy campaigns, movements, staged performances, and/or controversies in a public sphere. For such studies, thinking about context, voice, creativity, and judgment is vital. Less interested in universal claims, rhetoric, and cultural studies explore the relationship among bodies, institutions, and power within specific situations or conjunctures. Topics vary widely, including the environmental justice movement's foregrounding of the relationship between racial injustices and environmental degradation; the commodification of human-nonhuman animal relationships on eco-tours; and the cultural salience of environmental documentary films or cli-fi films.

## **1.7. DIVERSE ENVIRONMENTAL VOICES IN THE PUBLIC SPHERE**

The landscape of environmental communication is complex, as is the possibility of having one's voice heard. As communication scholar Eric King Watts (2001) emphasizes, "voice" is not merely predicated upon if one is speaking but might be better appreciated as an embodied, ethical, and emotional occurrence that cannot be heard or ignored void of communal contexts and commitments. Whether or not someone feels capable of expressing his or her voice and feels heard is connected to the health of the public sphere. While Watts's research has focused on race and conservative voices, his argument is relevant to the ways in which environmental community scholars have long studied voice (Peeples & Depoe, 2014).

- Citizens and Civil Society
- Non-governmental organizations
- Politicians and public officials
- Businesses
- Scientists and scholars
- Journalists

## **1.8. SUMMARY**

Environmentalism began with environmental communication. Environmental communication is the application of communication approaches, principles, strategies, and techniques to environmental management and protection. Simply put, it is the deliberate exchange of environmental information, knowledge, and even wisdom. It is inspired by general systems theory and adheres to the principle that the goal of human communication is mutual understanding.

Environmental communication has four major messages or themes inspired by Barry Commoner's Four Laws of Ecology:

1. Everything is connected to everything else.
2. Everything must go somewhere.
3. Nature knows best.
4. There is no such thing as a free lunch.

### 1.9. TECHNICAL TERMS

**Biosphere:** This includes all biotic parts of the hydrosphere, lithosphere, and atmosphere.

**Abiotic:** Non-living components ex. energy, radiation, temperature, water, atmospheric gases, fire, gravity, topography and soil.

**Biotic:** Living components ex. microbes, plants and animals.

### 1.10. SELF-ASSESSMENT QUESTIONS

1. In your own words, define Environmental Communication.
2. List down other messages of Environmental Communication that were not covered by Commoner's Four Laws of Ecology.
3. Why is networking essential in Environmental Communication?
4. Which form of Environmental Communication is sustainable? Why?

### 1.11.SUGGESTED READINGS

1. Commoner, Barry. (1971). *The Closing Circle, Nature, Man and Technology*. New York: Bantam Books.
2. Environmental Management Bureau. (undated). *Primer on the Environment*. Quezon City: Department of Environment and Natural Resources.
3. J.V.Vilani (1993): *Science Communication and Development*, Sage Publishers,
4. D.W. Burkett (1973): *Writing Science News for the Mass Media*, Gulf Publishing Company, Redas, Texas, USA
5. Pamela Creedon, *Women Mass Communications*
6. Stuart, Teresa H., and Rodolfo A. Fernandez. (1992). *Media Coverage of Environmental Problems and Policies in the Philippines*. Media Asia, Vol. 19. No. 2. Singapore.
7. Charlotte Krolokke, & Annie Scott Sorensen (2005), *Gender Communication: Theories and Analysis*, Sage Publications.
8. H.O. Aggarwal (2000), *International Law and Human Rights*, Central Law Publications, Allahabad.
9. N.J. Wheeler & Tomothy Dunne (1999), *Human Rights in Global Politics*, Oxford, London.
10. Robert Cox (2006), *Environmental Communication and Public Sphere*, Sage, London
11. L.Wallack, et.al. *Media Advocacy and Public Health*, Sage, London New Delhi.

**Dr. Padma Ponugoti**

## LESSON 2

# GLOBAL ENVIRONMENTALISM

### OBJECTIVES

After completing this chapter, you should be able to:

1. Learn the Global Environmentalism in world aspect
2. Acquire causes of environmental issues at the Global Level
3. Study essentials of Global Environmental Initiatives
4. Describe world major incidents at the Global level.

### Structure

- 2.1. Introduction**
- 2.2. Definitions**
- 2.3. Key principles and values of Global Environmentalism**
- 2.4 Environmental Issues at the Global Level**
- 2.5. Global Environmental Initiatives**
- 2.6 Role of individuals in global environmentalism**
- 2.7. Environmental education and awareness**
- 2.8. Summary**
- 2.9. Technical Terms**
- 2.10. Self-Assessment**
- 2.11. Suggested Readings**

### 2.1. INTRODUCTION

An Introduction to Global Environmental Issues presents a comprehensive and stimulating introduction to the key environmental issues presently threatening our global environment. Offering an authoritative introduction to the key topics, a source of the latest environmental information, and an innovative stimulus for debate, this is an article for all those studying or concerned with global environmental issues. Major global environmental issues are brought into focus. Explanations of the evolution of the earth's natural systems (hydrosphere, biosphere, geosphere, ecosphere) provide an essential understanding of the scientific concepts, processes, and historical background to environmental issues. Contemporary socioeconomic, cultural, and political considerations are explored and important conceptual approaches such as Gaian hypotheses and Chaos Theory are introduced. Human impact and management of the natural environment and concerns for maintaining biodiversity are emphasized throughout. The rapidly growing population and economic development are leading to a number of environmental issues in India because of the uncontrolled growth of urbanization and industrialization, expansion and massive intensification of agriculture, and the destruction of forests. Major environmental issues are forest and agricultural degradation of land, resource depletion (water, mineral, forest, sand, rocks, etc.), environmental degradation, public health, loss of biodiversity, loss of resilience in ecosystems, and livelihood security for the poor. It is estimated that the country's population will increase to about 1.26 billion by the year 2016. The projected population indicates that India will be the first most populous country in the world and China will be ranking second in the year 2050.

India having 18% of the world's population on 2.4% of the world's total area has greatly increased the pressure on its natural resources. Water shortages, soil exhaustion and erosion, deforestation, and air and water pollution afflict many areas. The condition of the environment is a worldwide issue. Air and water pollution do not recognize borders; poor soil conditions in one nation may reduce another country's food supply. At the same time, different regions face different problems. One key distinction is between the environmental threats faced by developed nations, such as the United States and Western European countries, and developing nations, such as India and Mexico. Most agree that these nations may have dissimilar crises, but debate remains over whether the solutions to their problems are unique as well. The environmental problems faced by developed nations are largely the result of their economic strength and higher standards of living. Overconsumption is cited by many observers as a cause of resource depletion in the First World. Americans, and to a lesser extent western Europeans, Japanese, and other residents of developed nations, are more likely to own one or more cars, purchase more food and clothes than subsistence levels require, and use considerable amounts of electricity. Americans consume a disproportionate amount of the planet's resources. The United States is home to 5% of the world's population but uses 25% of its resources.

Overall, the developed world has 23% of Earth's population but consumes two-thirds of the resources. Environmentalists contend that this high level of consumption will ultimately lead to the depletion of the planet's resources, resulting in adverse consequences for human populations. Developed nations have reduced their rate of population growth, so overpopulation is not as great a problem as it was previously considered to be; however, because of the high level of consumption, each new person in a developed nation will use three times as much water and ten times as much energy as a child born in a developing country. The industries needed to create products for consumption also affect the environment through the emission of greenhouse gases and other wastes.

## **2.2. DEFINITION**

Global Environmentalism refers to the collective efforts and actions taken by individuals, organizations, and governments across the world to address and mitigate environmental challenges on a global scale. It recognizes the interconnectivity of ecosystems and the need for sustainable practices to ensure the well-being of the planet and future generations.

### **1. The objectives of Global Environmentalism**

1. The preservation and protection of biodiversity,
2. The conservation of natural resources,
3. The reduction of greenhouse gas emissions, and
4. The promotion of sustainable development.

It aims to foster a harmonious relationship between human activities and the environment, striving for long-term ecological balance.

### **2. Scope of Global Environmentalism**

Global Environmentalism encompasses a wide range of environmental issues such as climate change, deforestation, pollution, habitat destruction, and loss of biodiversity. It



involves understanding the complex interactions between human actions and natural systems and seeking innovative solutions to address these challenges at both local and global scales.

### **3. The Role of Science in Global Environmentalism**

Science plays a crucial role in Global Environmentalism, providing the foundation for understanding the causes and consequences of environmental issues. It helps in the formulation of evidence-based policies and strategies, as well as in monitoring and assessing the effectiveness of environmental initiatives. By utilizing scientific knowledge and research, Global Environmentalism can better inform decision-making processes and drive positive change.

### **4. History and Evolution of Global Environmentalism**

The history of global environmentalism dates back to the late 19th century when concerns about the detrimental effects of industrialization on the environment began to emerge. This marked the dawn of the conservation movement, with individuals like John Muir and Theodore Roosevelt leading the way. Muir, known as the “father of national parks,” advocated for the preservation of natural landscapes and the establishment of national parks. Roosevelt, during his tenure as President of the United States, implemented policies to protect public lands and wildlife.

### **5. Sub-Emergence of Global Environmental Awareness**

It was during the 1960s and 1970s that global environmentalism gained significant momentum and became a recognized global movement. This period saw various environmental crises, such as oil spills and air pollution disasters, which raised public concern about the state of the environment. The publication of Rachel Carson’s book “Silent Spring” in 1962 also played a crucial role in raising awareness about the harmful effects of chemical pesticides on the environment and human health. Additionally, the first Earth Day in 1970 brought together millions of people worldwide in support of environmental protection.

### **6. Sub International Efforts for Environmental Conservation**

In the late 20th century, global environmentalism expanded beyond national borders, leading to the establishment of international treaties and organizations dedicated to environmental conservation. The United Nations played a pivotal role in coordinating global efforts, with the United Nations Environment Programme (UNEP) being established in 1972. This marked a significant step forward in addressing environmental issues at a global scale. Subsequent international agreements, such as the Kyoto Protocol and the Paris Agreement, further solidified the commitment of nations to tackle climate change. The evolution of global environmentalism has led to increased collaboration and cooperation among countries for the protection of the planet.

## **2.3. KEY PRINCIPLES AND VALUES OF GLOBAL ENVIRONMENTALISM**

1. **Sustainability:** Sustainability is one of the fundamental principles of global environmentalism. It emphasizes the need to use natural resources in a way that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. Sustainable practices promote the conservation of resources and the protection of ecosystems to ensure their long-term viability.

2. **Conservation:** Conservation is another key principle of global environmentalism. It involves the responsible management and protection of natural resources, such as forests, oceans, and biodiversity. Conservation aims to maintain the ecological balance and the health of ecosystems by preventing their degradation and loss.
3. **Environmental Justice:** Environmental justice is an important value upheld by global environmentalism. It recognizes the disproportionate burden of environmental degradation and pollution on marginalized communities. Environmental justice advocates for fair distribution of environmental benefits and burdens, ensuring that all individuals, regardless of their race, socioeconomic status, or geographical location, have equal access to a clean and healthy environment.
4. **Climate Action:** Climate action is a critical principle of global environmentalism in response to the global climate crisis. It emphasizes the urgent need to reduce greenhouse gas emissions, transition to renewable energy sources, and implement adaptation measures to mitigate the impacts of climate change. Climate action also includes raising awareness, advocating for policies, and promoting sustainable practices to combat climate change.
5. **Collaboration:** Collaboration is a core value of global environmentalism. Recognizing that environmental issues transcend national boundaries, global environmentalism encourages international cooperation and collaboration among governments, organizations, and individuals. Collaboration enables the sharing of knowledge, resources, and best practices in addressing environmental challenges on a global scale.

## 2.4. ENVIRONMENTAL ISSUES AT THE GLOBAL LEVEL

- Depletion of natural resources
- Water pollution
- Air pollution
- Groundwater pollution
- Toxic chemicals & soil pollution
- Ozone layer depletion
- Global warming
- Loss of biodiversity
- Extinction of wildlife and loss of natural habitat
- Nuclear waste and radiation issues
- Global Environmental Issues List

If asked what are the global environmental issues that the planet faces today, most people out there wouldn't be able to go beyond global warming and the energy crisis. These people are not aware of the fact that there are several other issues of global concern, each of which is equally hazardous. More importantly, all these issues are related to each other in some or the other way, and hence, tackling them one by one has just become difficult.

1. **Climate change:** Climate change has become more than obvious over the past decade, with nine years of the decade making it to the list of hottest years the planet has ever witnessed. The rise in temperature has also ensured that the equations on the planet have gone for a toss. Some of the most obvious signs of this include irregularities in weather, frequent storms, melting glaciers, rising levels of the sea, etc. Going by the prevailing conditions, it is not difficult to anticipate that the planet is heading for a dramatic climate change, in the near, future.

2. **Conservation of species:** Yet another global environmental issue, species conservation basically deals with the conservation of flora and fauna, in order to curb the extinction of species. Extinction of a single species of plant or animal results in a dramatic imbalance in the ecosystem, as a number of other species dependent on it directly or indirectly are also affected. Over the last century or so, several plants and animal species have become extinct thus resulting in a major loss for the biodiversity of the planet.
3. **Energy crisis:** The fact that we are largely dependent on fossil fuels for our energy requirements has made us significantly vulnerable to severe energy crisis. Though, quite a few renewable energy sources have been identified, none of them have been promising enough when it comes to the replacement of fossil fuels as the major source of energy for mankind. Attempts to tap the full potential of these sources are in progress, and our future by and large depends on these attempts, as fossil fuels are on the verge of exhaustion.
4. **Exploitation of natural resources:** Our greed for more has left us empty-handed in terms of natural resources in several parts of the world. Several human activities, including the likes of mining, agriculture, fishing, etc., have resulted in drastic degradation of our natural resources. While mining and agriculture have triggered large-scale deforestation, overfishing has only resulted in the reduction of the population of marine creatures inhabiting the planet. If the trends continue, we are bound to exhaust those natural resources on which we are dependent, and thus dig our own graves.
5. **Land degradation:** Land pollution, owing to human activities, and desertification, due to loss of vegetation has left the surface of the planet unsuitable for human use. Land degradation can be attributed to the fact that we have become too laid-back in terms of preservation of the nature. Improper soil use, haphazard waste disposal, large-scale deforestation, and other such human activities harmful to nature are on the rise, something which is invariably taking a toll on our natural surroundings.
6. **Land use:** Global environmental problems pertaining to the land are not just restricted to haphazard waste disposal or large-scale deforestation, but also to improper use of land. The natural environment is being destroyed to make way for urban sprawl, which is indirectly resulting in the loss of habitat for several species. Fragmentation of land owing to construction is also a major factor when it comes to improper land use. All these factors together result in several problems, including soil erosion, degradation of land, and desertification.
7. **Nuclear issues:** Nuclear power does have high potential, but the problems associated with it are no less. Radioactive waste from nuclear power plants is one of the major problems we are likely to face, especially if safety regulations are not followed properly. Chernobyl tragedy has set an example of how nuclear waste can lead to disaster for mankind, and no one would like to see another Chernobyl happening. It doesn't end here as the threat of some nation diverting its nuclear power to produce a nuclear arsenal is always looming over mankind. And it won't take an Einstein to imagine the amount of damage these nuclear weapons would cause.
8. **Overpopulation:** Yet another major global environmental issue is overpopulation. As the population of the world continues to soar at an alarming rate, the pressure on the resources of the planet is increasing. These problems associated with overpopulation range from food and water crisis to a lack of space for natural burial. Overpopulation also results in various other demographic hazards. Incessant population growth will not just result in the depletion of natural resources, but will also put more pressure on

the economy. After all, sustaining a huge population requires quite a mammoth effort for a nation, as far as finance is concerned.

9. **Pollution:** This is perhaps the most obvious, yet most ignored global environmental issue in this list of environmental problems. The term 'pollution' in itself has several other aspects, prominent ones among which include air pollution, water pollution, and land pollution. On one hand, air pollution can be attributed to the large amount of carbon dioxide pumped into the atmosphere by industries and vehicles, water pollution, and land pollution is caused as a result of waste disposal from factories, oil-carrying vessels, etc. Basically, mankind is to be blamed for this issue as our activities tend to hamper the environment at an alarming rate. If this trend continues, we will be very soon left without any fresh air to breathe, and clean water to drink.
10. **Waste management:** As the population increases, human activities increase, which eventually increases the amount of waste produced. This waste doesn't just include those harmful gases let out in the atmosphere or toxic waste released in water bodies but also includes nuclear waste, e-waste, medical waste (Abhijit Naik), and even waste from our homes. With limited area available on the planet, and most of it being inhabited by us, we are left with no space to dispose of this waste. The rate at which this waste is produced is far more than the rate at which it is being treated, and this just results in the piling up of waste, which eventually pollutes the environment.

These were some of the major global environmental issues and problems that have been threatening the planet for quite some time now. However, the environmental issues the planet faces today are not just restricted to the list given above. Several issues, including problems due to the construction of dams, genetic pollution, Nano toxicology, etc., are surfacing every other day, thus making the list of global environmental issues longer with time. If we don't start attending to these issues one by one, the moment is not far when we will have no option left but to surrender to these environmental issues.

## 2.5. GLOBAL ENVIRONMENTAL ORGANIZATIONS AND INITIATIVES

Global environmental organizations and initiatives play a crucial role in addressing and mitigating environmental issues on a global scale. These organizations are dedicated to advocating for environmental protection, raising awareness, and promoting sustainable practices worldwide.

One of the most prominent global environmental organizations is the United Nations Environment Programme (UNEP). UNEP coordinates international efforts to protect the environment and provides a platform for countries to collaborate on environmental issues. Through its various programs and initiatives, UNEP works towards promoting sustainable development, fighting climate change, and conserving biodiversity.

Previous Major Gas Leakage Incidents in the World

### 1. Oppau Explosion in Germany (1921):

The explosion occurred on September 21, 1921, when a silo that was storing 4,500 tonnes of ammonium sulphate and ammonium nitrate fertilizer mixture exploded at the Oppau plant in Germany. It killed between 500 – 600 people and there were about 2,000+ people who were injured. The blast was felt for miles, damaging the factory and the surrounding community.

### 2. Coal Dust Explosion (1942):

Honkeiko Colliery Mining Disaster, a deadly explosion that occurred on April 26, 1942, is a coal mine at Benxi, Liaoning province, China. The disaster killed 1,549 Chinese miners. Gas exploded in one of the shafts on April 26, 1942, and sent flames bursting out of the entrance. In the immediate aftermath, guards were stationed at the shaft opening. Miners' relatives from the surrounding area rushed to the scene and were rebuffed by the guards, who soon erected an electric fence to keep unauthorized personnel away from the site.

### **3. Fertilizer ship explosion (1947):**

Ammonium nitrate was used as an explosive by the U.S. Army in World War II and, after the war ended, production of the chemical continued as its use as a fertilizer became accepted. However, the precautions used in its transport became far laxer in the post-war years. On April 16, 1947, the Grand camp was, being loaded with ammonium nitrate as well as tobacco and government-owned ammunition. Cigarette smoking, although officially banned, was a common practice by longshoremen on the docks. Just two days prior to the explosion, a cigarette had caused a fire on the docks. On the morning of April 16, smoke was spotted deep within one of the Grand camp's holds.

### **4. Dynamite truck explosion (1956):**

In the early morning hours of August 7, 1959, a fire at Garretson Building Supply Company ignited a truck parked on the adjacent street. The truck was carrying a two-ton load of dynamite and four and one-half tons of ammonium nitrate. The subsequent blast leveled eight city blocks. The explosion created a crater fifty-two feet in diameter and twelve feet deep. Three hundred businesses within a thirty-block radius were damaged by the blast. Of those, seventy-two were declared structurally unsafe resulting in major repairs and renovation. Twelve buildings beyond the eight-block perimeter were condemned. The face of Roseburg changed forever in an instant. The explosion eventually became commonly known as "The Blast."

### **5. Flixborough (Nypro UK) Explosion 1st June 1974:**

During the late afternoon of 1 June 1974, a 20-inch bypass system ruptured, which may have been caused by a fire on a nearby 8-inch pipe. This resulted in the escape of a large quantity of cyclohexane. The cyclohexane formed a flammable mixture and subsequently found a source of ignition. At about 16:53 hours there were a massive vapour cloud explosion which caused extensive damage and started numerous fires on the site.

### **6. Mine Flooding (Chasnala mining disaster 1975):**

On 27 December 1975, there was an explosion in the Chasnala colliery, which is situated 20 km from Dhanbad in present-day Jharkhand. The explosion was probably caused by sparks from mining apparatus that ignited some flammable methane gas. The severe explosion led to the mine collapsing as a result of which millions of gallons of water from a reservoir in the vicinity were flown into the mine at a staggering rate of 7 million gallons per minute. Some mine workers were killed in the explosion. The remaining were trapped when the roof caved in and then drowned because of the gushing-in water. The Chasnala Colliery was then owned by the India Iron and Steel Company (IISC). Now the mine is owned by the Steel Authority of India Limited (SAIL) as IISC merged with SAIL. The local workers' union had placed the death toll at 700, although the official record is 372.

### **7. Chemical leak (1976):**

On Saturday, 10 July 1976 at 12:37 PM, a chemical reactor exploded at the ICMESA plant located in Meda near Seveso, Italy (25 km north of Milan) (see previous detailed

descriptions. The plant was manufacturing 2, 4, and 5-trichlorophenol, an intermediary for cosmetics and pharmaceuticals. A runaway chemical reaction resulted in the release of an aerosol cloud that included sodium hydroxide, ethylene glycol, sodium tri chlorophenate, and an estimated 15 to 30 kg of TCDD over an 18-km<sup>2</sup> area. Area residents in the path of the aerosol cloud developed nausea, headaches, and eye irritation, and 19 children were admitted to the local hospitals with skin lesions. In the ensuing weeks, the area experienced high animal and plant mortality, and nearly 200 cases of chloracne were reported among residents, mostly among children.

### **8. Biological Warfare plant accident (1979):**

In early April of 1979, a mysterious plague wafted through the Soviet city of Sverdlovsk, now known as Ekaterinburg. At least 66 people and an unknown number of animals were struck with a vague illness and then swiftly died. Soviet officials blamed tainted meat sold on the black market. But a 1992 investigation by a Harvard researcher finally aired the real killer: a plume of anthrax spores accidentally released from a clandestine bioweapons plant in town, known as Compound 19.

It was one of the largest inhalation anthrax outbreaks in history and one of the few traces of the Soviet's secret dabbling in bio-weapons research thanks to botched air filter maintenance. The slow-moving death cloud that seeped from the compromised ventilation system left a trail of carnage 30 miles downwind of Compound 19. If the breeze had blown directly toward the centre of town, which sits about 230 miles north of Russia's border with Kazakhstan, thousands could have been killed.

### **9. Natural Gas Explosion (1984):**

At approximately 05:35 hours on 19 November 1984, a major fire and a series of catastrophic explosions occurred at the government-owned and operated PEMEX LPG (Liquid Petroleum Gas) Terminal at San Juan Ixhuatepec, 20 km north of Mexico City. As a consequence of these events some 500 individuals were killed and the terminal destroyed. The facilities, owned by the Pemex State Oil Company, consisted of six spherical storage tanks (four with a volume of 1600 m<sup>3</sup> and two with a volume of 2400 m<sup>3</sup>) and 48 horizontal cylindrical bullet tanks of different sizes. At the time of the disaster, the storage tanks contained 11,000 m<sup>3</sup> of a mixture of propane and butane. Three refineries supplied the facility with LPG on a daily basis. The plant was being filled from a refinery 400 km away, as on the previous day it had become almost empty. Two large spheres and 48 cylindrical vessels were filled to 90% and 4 smaller spheres to 50% full.

### **10. Nuclear power plant accident (1986):**

The April 1986 disaster at the Chernobyl nuclear power plant in Ukraine was the product of a flawed Soviet reactor design coupled with serious mistakes made by the plant operators. It was a direct consequence of Cold War isolation and the resulting lack of any safety culture. The accident destroyed the Chernobyl 4 reactor, killing 30 operators and firemen within three months and several further deaths later. The Chernobyl Power Complex, lying about 130 km north of Kiev, Ukraine, and about 20 km south of the border with Belarus, consisted of four nuclear reactors of the RBMK-1000 design (see information page on RBMK Reactors). Units 1 and 2 were constructed between 1970 and 1977, while units 3 and 4 of the same design were completed in 1983. The United Nations Scientific Committee on the Effects of Atomic Radiation has concluded that, apart from some 6500 thyroid cancers (resulting in 15 fatalities), "there is no evidence of a major public health impact attributable

to radiation exposure 20 years after the accident. "Some 350,000 people were evacuated as a result of the accident, but resettlement of areas from which people were relocated is ongoing.

### **11. Poisonous gas Leak (1984): Bhopal Gas**

World's biggest industrial tragedy on the intervening night of December 2 and 3 in 1984 that day gas leaked from the Union Carbide pesticide plant. The highly toxic methyl isocyanate (MIC) gas can cause death within minutes of inhalation if its concentration exceeds 21 PPM (parts per million). International Labour Organization (ILO) released a report in April 2019, dubbed the 1984 Bhopal Gas Tragedy as one of the world's 'major industrial accidents' of the 20th century. The report said that at least 30 tons of methyl isocyanate gas, released from the Union Carbide pesticide plant, had affected more than 600,000 workers and nearby inhabitants. Victims (survivors) continue on the 36th anniversary of the disaster.

First, in the 1980's early 1990's some major ecological disaster events took place, which had global consequences. There was a Bhopal gas tragedy in 1984 (dangerous gas leakage killing sixteen thousand people and injuring thousands in India), the nuclear disasters at Chernobyl in April 1986 (killing thousands of people in former USSR), the Alaskan oil spill from the Exxon Valdez tanker in March 1989 and the Gulf War in the early 1990's killing thousands of fauna species especially birds, due to the spilling and burning of oil wells.

The Worst industrial disaster in history happened in an Indian plant operated by Union India Ltd., owned by Union Carbide of the United States. The Bhopal disaster killed an estimated 15,000 people and injured tens of thousands after a cloud of 40 tons of deadly gases Methyl Isocyanate (MIC) exploded from a Faulty tank in a Pesticide Plant and spread in the air in Bhopal, India on the early morning hours of Dec 3, 1984. The killer gas spread through the city, sending residents scurrying through the dark street. When victims arrived at hospitals breathless and blind, doctors did not know how to treat them. Union Carbide India Limited (UCIL) provided emergency information. It was only when the sun rose the next morning that the magnitude of the Devastation was clear. Dead bodies of humans and animals blocked the streets, leaves turned blocked, and the smell of burning chill peppers lingered in the air. Estimates suggested that as many as 10,000 may have died immediately and 30,000 to 50,000 were too ill to ever return to their jobs. Union Carbide discontinued investment following the tragedy and has also failed to clean up the industrial site completely. Today in Bhopal there is abnormal skin, lung, and gastrointestinal cancer increases.

The women in Bhopal continue after decades to have serious menstrual problems miscarriages are seven times higher than the national average according to BBC. Many of today's children have genetic defects and the survivors continue to suffer from poor blind and impaired immune systems. In 2002, 'Green Peace' found a number of toxins still present in nursing women's breast milk. According to BBC current estimates show that one person perishes every day from the effects of the gas (Steve Condie, 2004). Local newspapers in Bhopal published articles criticizing the poor management of the Bhopal plant. One newspaper said, "The day is not far for off when Bhopal will be a dead city, when only scattered stones and debris will bear witness to its tragic end" (Rapat Weekly, 1982). In 1982, MIC escaped from a broken valve, seriously affecting four workers and causing eye irritation and breathlessness among people in the nearby communities. The toxicity has been passed on to the second and third generations.

The resultant Report (Delhi Science Forum, 18 December 1984), which was released within two weeks of the disaster, was a landmark. Its analysis of why and how the disaster happened provided a knowledge base for much of the popular movements to follow, and has remained to this day the definitive technical analysis of the event, not surpassed or superseded by any subsequent study including the government's own analytical report of 1985 (Varadarajan 1985) authored by the then Director General of the Council of Scientific and Industrial Research (CSIR), a network of over 40 government research laboratories covering different disciplines. The DSF Report helped focus the post-Bhopal popular movement and shape much of its immediate, short and medium-term demands and orientation as regards industrial licensing, industrial siting policy, regulation of manufacture, storage, and handling of hazardous materials, and regulation of occupational safety

## **2.6. GLOBAL ENVIRONMENTAL ORGANIZATIONS AND INITIATIVES**

Besides UNEP, there are numerous other global environmental organizations that contribute to the protection of the environment. The World Wildlife Fund (WWF) is a leading conservation organization that focuses on preserving endangered species and their habitats. It works towards creating a more sustainable future for both wildlife and humans.

Another notable organization is Greenpeace, known for its direct action and campaigns aimed at raising awareness about environmental issues. Greenpeace tackles issues such as deforestation, pollution, and climate change through peaceful protests and advocacy.

In addition to organizations, there are also various global environmental initiatives that promote sustainable practices and address specific environmental challenges. The Paris Agreement, for instance, is an international treaty aimed at combating climate change by reducing greenhouse gas emissions. This agreement brings together countries from around the world to work towards a low-carbon future.

Furthermore, initiatives like the Sustainable Development Goals (SDGs) set by the United Nations provide a comprehensive framework for sustainable development, encompassing environmental, social, and economic aspects. These goals serve as a roadmap for governments, organizations, and individuals to contribute towards a more sustainable and equitable world.

### **Role of Individuals in Global Environmentalism**

In the vast landscape of global environmentalism, individuals play a crucial role in shaping the future of our planet. While global environmentalism encompasses various organizations and initiatives, it is ultimately the collective actions of individuals that can bring about meaningful change. This section delves into the different ways in which individuals can contribute to global environmentalism.

### **Consumer Choices and Sustainable Living**

One of the most powerful ways in which individuals can contribute to global environmentalism is through their consumer choices. By supporting environmentally friendly products and companies, individuals can help drive demand for sustainable practices and encourage businesses to adopt greener approaches. Moreover, adopting a sustainable lifestyle



can have a domino effect, inspiring others and creating a ripple effect that positively impacts the planet.

## 2.7. ENVIRONMENTAL EDUCATION AND AWARENESS

Education and awareness are integral to global environmentalism, and individuals can play a crucial role in spreading knowledge about environmental issues. By staying informed about current environmental challenges and sharing this knowledge with others, individuals can raise awareness and foster a sense of urgency. Environmental education can take many forms, ranging from engaging in conversations with friends and family to participating in community events or advocating for environmental issues through various platforms.

## 2.8. SUMMARY

The management of the global environment commons to Strengthen global, trans boundary, and regional cooperation as shared resources, requires cooperation amongst countries. Governments should adhere to and fulfill their commitments to existing multilateral environmental agreements (i.e., the Convention on Biological Diversity, the United Nations Framework Convention on Climate Change, and the United Nations Convention to Combat Desertification) and UN Environment Assembly resolutions aimed at securing the global environmental commons. This includes leveraging and strengthening existing regional mechanisms on the environment, such as the Regional Forum of Ministers and Environment Authorities of Asia Pacific, the Asia-Pacific Ministerial Summit on the Environment, the Asia Pacific Ministerial Conference on Disaster Risk Reduction, and the Asia Pacific Ministerial Forum on Environment and Health as well as ensuring synergies with the regional Sustainable Development-related processes, such as the Asia Pacific Forum on Sustainable Development.

New multilateral agreements that guarantee the protection of terrestrial ecosystems and effectively extend marine protected areas to at least one-third of the ocean by 2030 could be explored. Existing mechanisms, networks, and initiatives that promote transboundary and regional cooperation for ensuring effective protection of biodiversity, as well as terrestrial, coastal, and marine ecosystems, should be strengthened and coordination across regional programs and initiatives encouraged. Better alignment between global, regional, and national policies, conventions, and initiatives further provides the opportunity to maximize political will and societal needs and to understand and clearly articulate the priorities for sustainable ecosystem management and restoration to a range of stakeholders.

## 2.9. TECHNICAL TERMS

**Environmental justice:** It advocates for fair distribution of environmental benefits and burdens, ensuring that all individuals, regardless of their race, socioeconomic status, or geographical location, have equal access to a clean and healthy environment.

**Climate action:** It also includes raising awareness, advocating for policies, and promoting sustainable practices to combat climate change.

**Global environmentalism:** It encompasses various organizations and initiatives, it is ultimately the collective actions of individuals that can bring about meaningful change.

## 2.10. SELF-ASSESSMENT QUESTIONS

1. Briefly write an essay on Global Environmentalism.
2. What are the main causes of Global Environmental issues?
3. How do the following factors contribute to the environmental crisis in India? What problem do they pose for the government?
4. Note Key principles and values of global environmentalism
5. Write major incidents at the global level Environmental issues?

## 2.11. SUGGESTED READINGS

1. Armiero, Marco & Sedrez, Lise; *A history of environmentalism*, 2014.
2. Arran Gare; Deep Ecology, the Radical Enlightenment, and Ecological Civilization, (2014), *The Trumpeter*, Volume 30, Number 2, page no. 185-205.
3. Charlotte Krolokke, & Annie Scott Sorensen (2005), *Gender Communication: Theories and Analysis*, Sage Publications.
4. David Bollier & Joan Claybrook, *Freedom from Harm* (1986), pp. 275- 292; The Wilderness Society.
5. Elijah A. Akintunde (2017) "Theories and Concepts for Human Behavior in Environmental Preservation" *Journal of Environmental Science and Public Health*. doi: 10.26502/JESPH.012.
6. ESCAP, ADB, UNDP, Asia-Pacific Sustainable Development Goals *Outlook Report* (Bangkok, 2017)
7. Guha, Ramachandra; *Environmentalism: A global history*, 1999; ISBN0321011694
8. H.O. Aggarwal (2000), *International Law and Human Rights*, Central Law Publications, Allahabad.
9. Harrison K. and Boy T. (2018) "Environmentalism and ecologism". [https://www.researchgate.net/publication/327121732\\_Environmentalism\\_and\\_ecologism](https://www.researchgate.net/publication/327121732_Environmentalism_and_ecologism).
10. J.V. Vilanilam (1993) : *Science Communication and Development*, Sage Publishers,
11. L. Wallack, et.al. *Media Advocacy and Public Health*, Sage, London
12. N.J. Wheeler & Tomothy Dunne (1999), *Human Rights in Global Politics*, Oxford, London.
13. Pamela Creedon, *Women Mass Communications*
14. Robert Cox (2006), *Environmental Communication and Public Sphere*, Sage, London.

**Dr. Padma Ponugoti**

## LESSON 3

# ENVIRONMENTAL MOVEMENTS IN INDIA

### OBJECTIVES

After studying this chapter, you should be able to:

1. Understand the Environmental Movements.
2. Causes for the emergence of environmental movements and their significance.
3. Major and popular environmental movements have taken place over the years.
4. Techniques and methods adopted to make the environmental movements a success.
5. Acquire knowledge of Environmental Provisions in Indian

### Structure

- 3.1 Introduction**
- 3.2 Cause of Environmental Movements**
- 3.3 Grassroots Environmental Movement in India**
- 3.4 Environmental Provisions in Indian**
- 3.5 Environmental Movements in India**
- 3.6 Impact of the Environmental Movements**
- 3.7 Summary**
- 3.8 Technical Terms**
- 3.9 Self-Assessment Questions**
- 3.10 Suggested Readings**

### 3.1 INTRODUCTION

An environmental movement is a type of social movement that involves an array of individuals, groups, and coalitions that perceive a common interest in environmental protection and act to bring about changes in environmental policies and practices. Environmental and ecological movements are among the important examples of the collective actions of several social groups.

### 3.2 CAUSE OF ENVIRONMENTAL MOVEMENTS

Environment Movements in India began after a significant rise in pollution was observed. As industrialization increased, it had an adverse impact on the earth's resources and quality. Apart from this, the various causes of environmental movement in India are provided below:

- The increasing confrontation with nature in the form of industrial growth, degradation of natural resources, and occurrence of natural calamities, has resulted in imbalances in the bio-spherical system.
- Major reasons for the emergence of environmental movements in India are as follows:
- Increased industrialization led to the degradation of natural resources;
- Hampering with the land to build factories and dams led to many natural disasters and calamities;
- Imbalances in environment and biospheres due to human activity;
- Increased pollution and subsequent health issues in people;

- Loss of land and rights of the tribal population;
- Unequal distribution of resources leads to loss of livelihood.
- Control over natural resources
- False developmental policies of the government
- Right of access to forest resources
- Non-commercial use of natural resources
- Social justice/human rights
- Socioeconomic reasons
- Environmental degradation/destruction and
- Spread of environmental awareness and media

### 3.3 GRASSROOTS ENVIRONMENTAL MOVEMENT IN INDIA

The Environmental Movement in India usually involves people who have been a victim of environmental degradation. Therefore, the green movements take place at the grassroots level. Some of the best examples of the environmental movement in India at the grassroots level, along with their related issues, are as follows.

- Protection of marine resources
- Industrial pollution
- Mining
- SEZ
- Dams
- Save Forest

Environmental movements in India play a significant role in the conservation of resources. These movements are necessary to ensure the protection of the environment. The importance of environmental movements in India is explained below:

- These movements are effective in stopping harmful government policies;
- They play a significant role in stopping the degradation of land and resources;
- They ensure people who have rights over the land are able to exercise them and do not get exploited for the sake of industrialization;
- Environmental movements help in spreading awareness about the various policies that threaten the environment;
- These movements are important from the perspective of Human Rights and Social Justice.

### 3.4 ENVIRONMENTAL PROVISIONS IN INDIAN

Constitution Provisions relating to the environment were incorporated into the Indian constitution through the 42nd Amendment in 1976. For the first time “Environmental Protection” got importance.

As per the Directive Principles of State Policy, Article 48 (A), “the State shall endeavour to protect and improve the natural environment and safeguard the forest and wildlife in the country.

According to Article 51 A (g), “It shall be the duty of every citizen of India to protect and improve the natural environment, including forests, lakes, rivers, and wildlife, and to have compassion for living creatures”. Besides this, the entire dealing with forests and wildlife was dropped from the State list and inserted in the “Concurrent List”.

### **1. Distribution of Environmental Legislation**

The Central Government under the Central List has the power to legislate on industry, mines and minerals, oil fields, fishing, inter-state rivers, and river villages. In addition, the Central Government is authorized to make social planning under the concurrent list of Schedule VII of the Indian Constitution. Since India is a federal system of Government, the State Government can also legislate on industry, mines, minerals, and fisheries, which is objected to as per the provision of the Central Government,

Some of the major areas of Central enactments formulated by the Central Government include water, air, radiation, pesticides, and forest and wildlife. Some of the specific environment-related legislations passed by the Central Government in different time periods in different sectors are as follows (Meheta, 1994, Trivedi et al 1995):

### **2. Water Pollution**

- The River Boards Act, 1956
- The Merchant Shipping (Amendment) Act, 1970
- The Water (Prevention and Control of Pollution) Cess Act, 1974 and 1977

### **3. Air Pollution**

- The Indian Boilers Act, 1923
- The Factories Act, 1948
- The Mines and Minerals (Regulation and Development) Act, 1947
- The industries (Development and Regulation) Act, 1961
- The Air (Preservation and Control of) Pollution Act, 1981

### **4. Radiation**

- The Atomic Energy Act, 1962
- Radiation Protection Rules, 1971

### **5. Pesticides**

- The Poison Act, of 1919
- The Factories Act, 1948
- The Insecticides Act, 1968

### **6. Forest & Wildlife**

- The Indian Fisheries Act, 1897
- The Indian Forest Act, 1927
- The Prevention of Food Adulteration Act, 1954
- The Ancient Monuments and Archaeological Sites and Remains Act, 1958
- The Wildlife (Protection) Act, 1972
- The Urban Land Ceiling and Regulation Act, 1976

Some of the best-known environmental movements in India have been briefly described below:

Origin of Environmental Movements in India: The genesis of concern for environmental protection in India, “can be traced back to the early twentieth century when people protested against the commercialization of forest resources during the British colonial period” (Sahu, Geetanjay 2007: 3). Again, he notes that, “It was only in the 1970s a coherent and relatively organized awareness of the ecological impact of state-monolithic development process started to develop, to grow into a fully-fledged understanding of the limited nature of natural resources and to prevent the depletion of natural resources” (Ibid).

At the international level, the growing salience of the environmental crisis was brought out by four important events. The first event was the United Nations Conference on ‘Human Environment’ held in Stockholm, Sweden (1972). The second event was the publication of the report “Limits to Growth”. The third, release of the report of the Brundtland Commission entitled ‘Our Common Future’ (1987). Fourth, event was the ‘Earth Summit’ in 1992 ((Vig, Norman J. and Regina S. Axelrod 2006: 29; Salunkhe, S. A., 2008: 38-40).

Guha, Ramchandra (1997: 345-346) lists the three events which occurred within the country in 1973, that facilitated debate on environmental issues in India:

First, in April, the government of India announced the launching of Project Tiger, an ambitious conservation program aimed at protecting the country’s national animals. Indian conservationists, encouraged and helped by international agencies like the World Wildlife Fund and the International Union for the Conservation of Nature, were instrumental in bringing pressure on the government to create a network of national parks and sanctuaries all over India to protect endangered wildlife.

Second, the publication of an article in *Economic and Political Weekly* (March 31, 1973) entitled ‘A Charter for the Land’ authored by B. B. Vora, a high official in the Ministry of Agriculture, which drew attention to the extent of erosion, water logging and other forms of land degradation in the country. The author through this article called for the formulation of an effective policy by the state in this regard and also for the creation of government departments to monitor and manage environmentally appropriate land use patterns. This reflected the first official concern relating to environmental degradation, which subsequently led to the creation of a national Committee for Environmental Protection and Control later that year. The Department of Environment was established in 1980 and a full-fledged Ministry of Environment and Forests was created five years later.

Third, on March 27, 1973, in Mandal, a remote Himalayan village, a group of peasants stopped a group of loggers from felling a stand of trees by hugging the trees. This event sparked a series of similar protests through the 1970s, collectively known as the “Chipko” movement. This movement raised basic questions relating to ecology, equity, and social justice and promoted lively debate and action throughout the country.

Thus, “the emergence of environmental debate in contemporary India and renewed scholarly attention towards environmental topics can be attributed to factors such as the influence of international events/agencies concerning global environmental conditions, growing official recognition of certain environmental problems in the country, and the emergence of environmental movements in India” (Guha, Ramchandra 1997: 345).

A large number of environmental movements have emerged in India, especially after the 1970s and 1980s. In this context, Sahu, and Geetanjay (2007) noted that In India, the environmental movement has grown rapidly over the last three to four decades. It has played a key role in three areas such as 1] in creating public awareness about the importance of bringing about a balance between environment and development, 2] in opposing

developmental projects that are inimical to social and environmental concerns, and 3] in organizing model projects that show the way forward towards non-bureaucratic and participatory, community-based natural resource management systems (Sahu, Geetanjoy 2007: 7).

Reasons for the Emergence of Environmental Movements in India: Major reasons for the emergence of environmental movements in India have been discussed by Sharma, and Aviram (2007) which include reasons such as i) control over natural resources, ii) false developmental policies of the government, iii) socioeconomic reasons, iv) environmental degradation/ destruction and, v) spread of environmental awareness and media. (Sharma, Aviram, 2007).

### 3.5 ENVIRONMENTAL MOVEMENTS IN INDIA

Major Environmental Movements in India: As pointed out above, a large number of environmental movements have emerged in India, especially after the 1970s. These movements have grown out of a series of independent responses to local issues in different places at different times. The emergence of environmental movements is not restricted to any particular part of the country. As pointed out by Karan, P. P. (1994: 32-33):

The environmental movements have emerged from the Himalayan regions of Uttar Pradesh to the tropical forests of Kerala and from Gujarat to Tripura. The main environmental movements are Chipko Andolan, Save the Bhagirati and Stop Tehri project committee in Uttar Pradesh, Save the Narmada Movement (Narmada Bachao Andolan) in Madhya Pradesh and Gujarat, youth organizations and tribal people in the Gandhamardan Hills whose survival is directly threatened by the development of bauxite deposits, the opposition to the Baliapal and Bhogarai test range in Orissa, the Appiko Movement in the Western Ghats, groups opposing the Kaiga nuclear power plant in Karnataka, the campaign against the Silent Valley project, the Rural Women's Advancement Society formed to reclaim wasteland in Bankura district and the opposition to the Gumti Dam in Tripura.....Local movements are working against deforestation, water-logging, salinization, and desertification in the command areas of dams on the Kosi, Gandak, and Tungabhadra rivers and in the canal-irrigated areas of Punjab and Haryana. Some other local movements like Pani Chetna, Pani Panchyat and Mukti Sangharsh advocate ecological principles for water use.

The following map shows the locations of activities of main environmental movements in India. Some of the best-known environmental movements in India have been briefly described below:

**1. Bishnoi Movement:** This movement was led by Amrita Devi in which around 363 people sacrificed their lives for the protection of their forests. This movement was the first of its kind to have developed the strategy of hugging or embracing the trees for their protection spontaneously (Nepal, Padam 2009: 136).

The genesis of environmental movements in India can be traced to The Chipko Movement started in 1973 in the Uttar Pradesh state. An organized resistance spread throughout India against the destruction of forests. The people from the villages especially women hugged the trees to prevent the contractors from felling them and hence the name of The Chipko Movement came from the word 'embrace'. This was reported by The Hindi

press. “It was Anupam Mishra, a freelance journalist who reported the historic event” (Hedge, 2010). Soon national and international dailies took up the issue and wrote which attracted international attention. The European and Scandinavian media also covered the movement for Gandhian approach of this movement. Sooner would have started talking about the movement which inspired many other movements throughout the world like The Appiko Movement in Karnataka.

Aarey Online campaign #SavetheSunderbans Sunderbans are the largest mangrove forests in the world, located in the delta region of the Ganga and Brahmaputra rivers

Between the 1970s and 90’s there were several struggles in India around issues of the right to forest and water which raised larger ecological questions like the rights of communities in forest resources, sustainability of large-scale environmental projects like dams, issues of displacement and rehabilitation, etc. The Narmada Bachao Andolan was the social movement against the construction of the dam across the River Narmada in Gujarat State. Adivasis, environmentalists, farmers, and human rights activists participated in this movement.

## 2. The Chipko and the Appiko Movements

These two words in Hindi and Kannada respectively, mean the same thing ‘to hug’. These movements represent the popular initiative aimed at preventing deforestation of the trees by adopting non-violent means such as hugging them.

The Chipko Movement started in 1973 when representatives from a sports goods factory in Allahabad reached Gopeswar to cut ten trees. They were asked by the villagers not to do so, but they persisted. Whereupon the villagers hit upon the novel idea of hugging their trees and thus preventing them from being cut. In weeks and months to come, this became the standard practice of the villagers in nearby areas, whenever any contractors or men from the industry came to cut the trees. In 1974, women also joined the movement in a big way under the leadership of Gaura Devi. Interestingly, an expert committee set by the state government, to enquire into the merits of the movement, concluded that the villagers were justified in preventing the felling of the trees from a scientific viewpoint also. The committee concluded that because of the highly sensitive nature of the watershed situated deep in the Himalayas, all felling should be banned to allow regeneration. Chandi Prasad Bhatt from Gopeswar and Sunderlal Bahuguna from Tehri were provided the leadership to the movement which continues to be very strong in district Chamoli.

## 3. The Appiko Movement

It was started in 1983 in Salkani Forests in Sirsi district in Karnataka and has been produced along the same lines as The Chipko. About 160 men, women, and children of the village hugged their trees and prevented the wood cutters from cutting them down. They formed an organization by the name of ‘Yuvak Mandali’ which focused the grievances on two major issues.

- ❖ Commercial felling by the contractors damaging a number of other trees, and
- ❖ Replacing the natural forests with teak and eucalyptus monoculture plantations.

Soon, the movement spread to other areas where The Appiko activists successfully resisted the contractors and the manufacturers of matchboxes, Panduranga Hegde was one of the leaders of The Appiko Movement.

## 4. The Silent Valley Movement



It was a remarkable people's movement that saved a virgin evergreen forest in Kerala from destruction by stopping a hydroelectric project across the Kuntipuzha River in Palakkad district. In 1970, the Kerala State Electricity Board proposed to build a hydroelectric dam that ran through Silent Valley. If the project had materialized, 8.3 square kilometers of virgin evergreen forest would have been destroyed. Kerala is blessed with rich natural resources and rare species of plant and animal life. People protested against the Government of Kerala when the government decided to construct a hydroelectric project at Silent Valley. The dam site consisting of nearly 8952 hectares of forest is one of the virgin forests abundant in rare species of flora and fauna. The lion-tailed macaques of this area play an important role in maintaining the eco-balance by eating the poisonous thorny bushes in those forests. Ecologists and environmentalists argued that the deforestation in Silent Valley would endanger the eco-balance and would change even the climate of Kerala state by diminishing the rainfall. Thousands of people were effectively involved in the movement against the Silent Valley project for ten years. People protested using every possible means available i.e., letters to the editors of various newspapers and magazines, conducted seminars, widespread awareness campaigns, applied petitions and appeals in court, etc. Nature clubs were organized all over Kerala to fight against the Silent Valley Project.

The movement that started as a local movement became national and international in nature because of the wide propaganda and the joining of popular environmentalists and writers. The Silent Valley Samrakshana Samiti (SVSS) and Kerala Sastra Sahitya Parishad (KSS), a voluntary organization conducted protests and demonstrations against the decision of the government of Kerala. They sent a petition to the government and tried to educate the public about the evils of deforestation by conducting silent demonstrations, rallies, debates, street dramas, and writing articles in leading newspapers. This enabled the movement to turn into a mass movement. The cry of the people was so loud that the government was forced to promulgate an ordinance and later an Act- the Silent Valley Protected Area (Protection of Ecological Balance) Act, was passed in 1979 to protect the eco-system of Silent Valley. Later, the project was completely dropped by declaring Silent Valley as a National Park in 1985. Due to people's actions being so powerful the government was forced to leave the project.

### **5. The Mulla Periyar Dam Movement**

The people of Kerala agitated for the protection of Mullaperiyar dam in Idukki district which was constructed in 1895 by John Pennycuick to divert water to the then Madras presidency which consisted of the present Tamilnadu state. It was constructed over the river Periyar using rubble and lime surkhi (burnt brick powder). Normally the lifespan of a dam of this type is only fifty years. Now after 120 years, the entire structure is unsafe. There was a lease agreement between the State of Travancore and the Madras Presidency in 1886 to supply water to the latter for a period of 999 years. The state of Tamilnadu has demanded the raising of the water level so as to get more water for its agricultural lands. Considering the dangerous condition of the dam, the Kerala government refused the proposal. Moreover, the dam is situated at a place which has high seismic potential. The Periyar National Park, Thekkady is located around the Periyar Reservoir formed by the backwaters of the dam. It is a highly protected tiger reserve and the presence of 62 different types of mammals has been recorded in the Periyar area. According to the report by the Kerala Forest Research Institute, the protected area around the dam and reservoir is a bio-diversity hot spot. The people of Kerala wanted the protection of the dam. Though the Kerala State government has proposed to construct a new dam to protect the people from destruction, this has not been materialized and the people living in the nearby areas are under the shadow of fear and despair. Their life

is unsafe and hence the government of Kerala has to take immediate steps to find alternative arrangement for the safe rehabilitation of the people.

### **6. Save the Chaliyar Movement**

In the case of the Chaliyar River in Kerala, the exploitation of water by the Gracim Rayons Company was followed by the reactions and struggles of the local people to protect the river. Rayon grade pulp and fiber plant started functioning in 1963. The company was given the freedom to take maximum water from the Chaliyar River for industrial use and to empty the wastes into the same river. Chaliyar River plays a very significant role in the lives of the people living on its banks. The people have been bound for years not only for livelihood but also for various religious, traditional, recreational, and cultural reasons. It has been a means of transportation for the people since early times. Agriculture was the main source of income of the people and the river paved the way for many other livelihood options. The local people used the water for drinking, cleaning, bathing, cultivation, etc. The disposal of waste materials and the extraction of excess water from River Chaliyar caused serious environmental problems such as resource depletion, pollution of the air, and water, and growth in the levels of solid, toxic, and hazardous wastes. As air and water pollution rose to dangerous levels, the local people could feel the incidences of diseases growing in the factory area.

The number of cases of malformed babies multiplied. There were high incidences of chronic bronchitis, Pneumonia, skin diseases, cancer, cardio-pulmonary afflictions, chronic asthma, tuberculosis, ulcers, kidney troubles, and vision problems due to the air and river water pollution. As the pollution problem increased, the people of the area became more active with protests, demonstrations, and submission of memorandums. Ultimately, the Kerala State Pollution Control Board ordered the closure of the plant, and the polluting factory was closed down in 2001. The Chaliyar agitation against Gwalior Rayon's factory is a success story of a people's environmental movement for the restoration of the Chaliyar River to its original state in order to save the river and guard it for their posterity.

### **7. The Narmada Bachao Movement**

The Narmada Bachao Andolan (NBA) was formed in 1987 to launch a movement against Sardar Sarovar Project (SSP). But even a decade earlier in 1977, the villagers of Nimad region of Madhya Pradesh, had protested as the potential threat of eviction loomed larger over them, the main issue of the protest in its first phase was the demand for adequate compensation for the land to be submerged in the SSP. This was the pre-NBA phase of 'moderate protest'. With the formation of the NBA in 1987, under the leadership of Medha Patkar, the second phase started where the main issue became proper rehabilitation of potential ousters.

NBA gained momentum, in the third phase in 1989-90 in two ways;

First, its base was broadened, and second, it applied more radical strategies of protest. The process of 'movement dynamics' involved four major events. (Gadgil and Guhe, 1994; Roy and Sen, 1992). In 1989, activists from the neighbouring villages of Badwani uprooted the stone markers from the submergence area of the dam and threw them outside the state legislative assembly in Bhopal.

Second, and more importantly, the Harsud rally was held on 20 September 1989, where more than 60,000 volunteers gathered. This town was significant because it too, later submerged in the dam as its height was not reduced.

1. There, the NBA took three fundamental decisions:
1. Total opposition to the dam, because there was no land available in Madhya Pradesh, Maharashtra, and Gujarat for implementation of the declared 'land for land' policy of rehabilitation.
2. Activists took a collective oath to oppose the kind and pattern of 'destructive development'.
2. 3. In May 1990, villagers from the Narmada basin gathered in New Delhi and sat on 'dharna' (sit-in strike) at Gol Mathi Chowk (close to the then Prime Minister V.P. Singh residence) for several days singing, dancing and delivering speeches.
3. Finally, on 25 December 1990, NBA organized a Sangharsh Yatra (Struggle March) from Rajghat (in Madhya Pradesh) to the border village of Ferkuva (they had originally planned to reach Kevada colony, the site of the SSP dam, but were stopped by Gujarat police from entering Gujarat state). However, about 100 activists including Baba Amte entered Gujarat, in four groups, with their hands tied to symbolize their non-violent method of resistance.

On the Madhya Pradesh side of the border, Medha Patkar and other activists sat on a hunger strike for three weeks, but the Gujarat government did not relent. This may be called the collective self-empowerment phase of the movement (Subash Sharma 2009).

### 3.6 IMPACT OF THE ENVIRONMENTAL MOVEMENTS

We have observed that in India the environmental movements could go beyond the social and cultural cleavages. They could unite people belonging to different castes, ethnic and economic categories, political ideologies, genders, and age groups. In many such movements, women who are normally considered as the weaker sections of society took the lead, both as leaders and participants, in these movements. Like the independence movement of India, people of all status groups, viz., children, youth, adults, old, and students, all sacrificed the ambitions of their lives and took part in taking ahead the concepts and the processes of these movements. It was commonly observed that in all the movements the people adopted the Gandhian Concept of non-violence and Satyagraha. These movements have established the fact that common property regimes of the people play crucial roles in the daily subsistence activities of poor peasants in India. All these issues are being debated at local, national, and international levels, where social scientists are playing a central role in debates at various levels, including national and international levels.

A couple of new methods have been developed and used in data collection by different anthropologists while studying ecological anthropology. Satellite imagery data, both synchronically and diachronically, are used to identify ecological hot spots, and studied by multi-disciplinary teams (Green and Sussman, 1990; Kottak et al 1994). Secondly, the Geographical Information System (GIS) studies micro situations relating to human and environmental features. Survey data across space and time may be used along with ethnographic studies to study environmental situations. A distinct anthropological perspective must be adopted to study the local specificity with respect to ecological and cultural diversities.

### 3.7 SUMMARY

We have observed that environmental movements have been a productive zone of inquiry. Environmental movements in India have established the fact that these are a series of transformative discourses. In some cases, the environmental debates have reflected the rights of the people over their natural resource basket, the source of livelihood for them. The denial of the traditional structure of control over these natural resources has been questioned by the communities, the major participants of such environmental movements. Often, they have questioned the exploitation methods and development models of the State. In anthropology, the combination of ecological and ethnographic approaches has expanded the scope of environmental research. This has brought in a paradigm shift in the content and focus of ecological anthropology from an applied perspective. When we map out the new approaches in the study of environmentalism, we find cases of resistance from people across space and time. The Subaltern voices crop up through such environmental movements have been established and anthropologists have taken such voices for ethnographic analysis. When we look at the social structure, degradation of natural resources, and related environmental changes, one finds the complimentary and symbiotic relationship between society and the environment, which is difficult to ignore.

### 3.9 TECHNICAL TERMS

**Chipko:** It means 'embrace' or hugging (in Hindi language).

**Appiko:** It means 'embrace' or hugging (in Kannada language).

### 3.10 SELF-ASSESSMENT QUESTIONS

1. How globalization has impacted the environment human life and the living conditions of rural people in India.
2. What is environmental movement? Do you think that socio-cultural factors play a crucial role in the movement processes that are taking place in rural India?
3. Do you think globalization has contributed to changing the nature of environmental movement in India? Explain with the help of a few cases of environmental movement from Eastern India.
4. What is environmental movement? Do you think that India has enough laws to protect the natural environment of the country?
5. What are the Environmental Provisions in India?

### 3.11 SUGGESTED READING

1. D.W. Burkett (1973): Writing Science News for the Mass Media, Gulf Publishing Company, Redas, Texas, USA
2. J.V.Vilani (1993): Science Communication and Development, Sage Publishers,
3. Amita Baviskar. 1998. In the Belly of the River. New Delhi: Oxford University Press.
4. Charlotte Krolokke, & Annie Scott Sorensen (2005), Gender Communication: Theories and Analysis, Sage Publications.

5. H.O. Aggarwal (2000), International Law and Human Rights, Central Law Publications, Allahabad.
6. Jyotshna Bapat. 2005. Development Projects and Critical Theory of Environment. New Delhi: Sage Publications.
7. L.Wallack, et.al. Media Advocacy and Public Health, Sage, London
8. N.J. Wheeler & Tomothy Dunne (1999), Human Rights in Global Politics, Oxford, London.
9. Omvedt, Gail. 1993. Reinventing Revolution: New Social Movement and the Socialist Tradition in India. New York: M.E. Sharpe Inc.
10. Pamela Creedon, Women Mass Communications
11. Rajendra Singh. 2001. Social Movements Old and New: A Post-Modernist Critique. New Delhi: Sage Publications.
12. Ramachandra Guha. 1989. The Unquiet Woods: Ecological Change and Peasant Resistance in the Himalayas. New Delhi: Oxford University Press.
13. Robert Cox (2006), Environmental Communication and Public Sphere, Sage, London.

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## LESSON 4

# MEDIA AND ENVIRONMENTAL JOURNALISM

### OBJECTIVES

After completing this chapter, you should be able to:

- Understand Media and Environmental Journalism
- Learn the importance of Media in the world
- Acquire knowledge of Media Platforms and Environmental Awareness
- Know who reports on the environment.
- Aware role of Environmental Journalism
- Observe relation between Media, Environment, and Society

### Structure

- 4.1 Introduction**
- 4.2 Environmental Communication**
- 4.3 Functions of Mass Media towards Environment**
- 4.4 The Media platforms**
- 4.5 Environmental Journalism is about humans' interaction with their own habitat**
- 4.6 Who reports on the environment?**
- 4.7 Summary**
- 4.8 Technical Terms**
- 4.9 Self-Assessment**
- 4.10 Suggested Readings**

### 4.1 INTRODUCTION

The Media is the most powerful entity on earth. They have the power to make the innocent guilty and to make the guilty innocent, and that's power. Because they control the minds of the masses. - Malcolm X

With today's mass media obsession, it's good to be able to raise awareness about our environment. -Robin McLeay

The practice of nature writing has a rich history dating back at least to the tales of exploration of Christopher Columbus and the late 19th-century notable nature writers such as Ralph Waldo Emerson and Henry David Thoreau, John Burroughs., John Muir in the early 20th century and Aldo Leopold in the 1940s, but the field of environmental journalism only began to take shape in the 1960s and 1970s. The growth of environmental journalism as a profession has roughly paralleled the growth of the environmental movement. The environmental movement became a mainstream cultural movement with the publication of Rachel Carson's *Silent Spring* in 1962 and was further legitimized with the passage of the Nature Conservation Act in 1964. Grassroots environmental groups flourished on the political stage in the 1960s and 1970s, seeking to raise public awareness of what many considered the "environmental crisis" and to influence environmental policy decisions. I was. Since then, the mass media have continued to follow environmental issues and have attracted public attention to environmental issues. The field of environmental journalism was further legitimized in 1990 by the creation of the Association of Environmental Journalists. Its mission is to

"promote public understanding of environmental issues by improving the quality, accuracy, and visibility of environmental reporting." Many institutions now offer academic programs to train budding journalists in the rigor, complexity, and breadth of environmental journalism.

## **1. Media**

The term media, which is the plural of medium, refers to the communication channels through which we disseminate news, music, movies, education, promotional messages, and other data. It includes physical and online newspapers and magazines, television, radio, billboards, telephone, the Internet, fax, and billboards.

It describes the various ways through which we communicate in society. Because it refers to all means of communication, everything ranging from a telephone call to the evening news on television can be called media.

Mass media here means communication through a number of physical transmission modes such as print, audio, visual, audio-visual, and electronic forms to a general mass of common persons, irrespective of their position, intellectual attainments, social status, etc. It is a means by which almost all current human affairs are collected, recorded, and disseminated for the consumption of any common person. It is an instrument by which the general common public is kept informed of the political activities of a state, international relations between countries, economic and business affairs, industrial relations, games and sports, cultural events and entertainment, and a host of other subjects.

Mass media is typically represented by printed daily newspapers, weekly, fortnightly monthly magazines; broadcasting over radio, telecasting over television, and a number of other combinations of audio and visual communications such as Audio Cassettes, Video Tapes, and Compact Discs of recorded music. This field has expanded very rapidly with the advances in information and communication technology. These have become very powerful tools in political, economic, business, cultural, and every other human activity. Let us examine the well-established institutions of the mass media.

## **2. Environment**

Environment can be defined as a sum total of all the living and non-living elements and their effects that influence human life. While all living or biotic elements are animals, plants, forests, fisheries, and birds, non-living or abiotic elements include water, land, sunlight, rocks, and air.

### **4.2 ENVIRONMENTAL COMMUNICATION**

Robert Cox defines environmental communication as "the pragmatic and constitutive vehicle for our understanding of the environment as well as our relationships to the natural world; it is the symbolic medium that we use in constructing environmental problems and negotiating society's different responses to them."

Alexander Flor explains that "environmental communication has six essentials: knowledge of ecological laws; sensitivity to the cultural dimension; ability to network effectively; efficiency in using media for social agenda setting; appreciation and practice of environmental ethics; and conflict resolution, mediation, and arbitration." Symbolic action of environmental communication serves two functions pragmatic and constitutive.

- 1) Environmental communication is pragmatic because it solves environmental problems by educating, alerting, collaborating, persuading, and mobilizing the masses. Communication plays a vital role in this area by helping citizens and organizations to achieve the goals of solving environmental problems.
- 2) Environmental communication is constitutive because by shaping our perceptions of the environment it helps to shape people's understandings of environmental issues.

### **Environmental Journalism**

Environmental journalism is the collection, verification, production, distribution, and display of information about current events, trends, and issues related to the non-human world. To become an environmental journalist, you need to understand scientific terminology. Individuals should use their knowledge of historical environmental events. Must be able to comply with environmental policy decisions and environmental organizations. Environmental journalists should have a general understanding of current environmental issues and the ability to communicate information to the general public in an understandable manner. Environmental journalism falls within the scope of environmental communication. Its roots can be traced back to natural writing. One of the controversies in environmental journalism is how to distinguish the genre from its related fields.

### **Dissemination of environmental facts:**

Technical jargon or generic terminology Media is generally attracted to gloom and doom stories of climate change. However, journalists are required to become more exposed to the language and the concept of risks in covering climate science. With climate models becoming more powerful and sophisticated, media professionals are better equipped to quantify uncertainties and generate probabilistic climate projections, easily comprehensible to the layperson.

Media is often a target for lobby groups, to amplify or underplay uncertainties around climate science for self-serving interests; leading to substandard reporting. In lieu of this, journalists must enhance their competencies to handle such risk, and be familiar with numbers and probabilities in order to formulate a more constructive narrative about climate change i.e. reframing technical uncertainties cited in scientific terms into more comprehensible measures of risk to the society. This would enable the people to perceive the problem, understand the risk, and actively engage in public dialogue to seek sustainable solutions (Pidgeon and Fischhoff, 2011).

## **4.3 FUNCTIONS OF MASS MEDIA TOWARDS ENVIRONMENT**

The mass media plays a significant role in modern society. Mass media has certain important functions to perform which include influencing and moulding public opinion. In this modern knowledge society, media can play the following roles in spreading environment-related information:

**a) Information Disseminator:** Mass media play a major role in shaping people's perceptions and their awareness of environmental issues. People unknowingly imbibe various kinds of behaviour's and attitudes from the media.

**b) Agents of Change:** The media and interpersonal interactions work together to reinforce the message and bring about persuasion to change our attitudes, beliefs, and behaviours. Though these are very difficult to change, mass media plays a major role in helping to change political preferences and religious attitudes. Once an attitude is formed, the media functions to channel it in a specific direction.



**c) Media as Stimulator:** The mass media activates latent attitudes, prompting people to take action. It helps in mobilizing the masses for collective action by appealing to people's conscience to participate in various environmental conservation and support activities, e.g. using paper bags or jute bags instead of Polybags, etc.

**d) Facilitator of development:** Media coverage is crucial for any environmental issue to enter into the arena of public discourse and become a part of the political process. Civil Society Interest groups and non-governmental organizations (NGOs) working on environment-related issues can cultivate the formation and spread of public opinion on issues of concern with the help of media.

**e) Messenger to policymakers:** Along with centre staging the environmental issues into the hub of debates and discussions, the media also tries to triangulate the opinions of different stakeholders. It works as a bridge by amplifying the popular opinions of people and communities across geographies and sharing them with policymakers and vice-versa. This plays a significant role in encouraging governments to devise environment-friendly policies. Across the world, rigorously covering and following upon events like the Bhopal Gas tragedy in 1984; and snow balling the discussion on the facts shared by the Academy Award-winning documentary on climate change, *An Inconvenient Truth*, in 2006, media has tremendously helped in creating a public opinion about significant environmental issues.

#### 4.4 MEDIA PLATFORMS AND ENVIRONMENTAL AWARENESS

Media play an important role in influencing the attitudes of the public towards the environment. The Media's role in increasing the environmental awareness of the population is an enormous one as it reaches a vast percentage of India's complex society.

Following are some common media platforms:

- 1. Newspapers and Magazines:** Newspapers have always been a profound source of information about daily events with the morning cup of tea. They act as a source of motivation, for example, when they educate farmers about ways of introducing organic farming, and new agricultural technologies, or sensitize them about the negative consequences of the use of pesticides, stubble burning, etc. As a result of such exposure and subsequent public pressure, local authorities, governments, industries, and other stakeholders are often forced to rectify their practices, strongly enforce laws and regulations, and abandon development projects if their environmental and social costs outweigh the benefits (both organizational and societal).

Similarly, the environmental magazine "*Down to Earth*" covers a wide variety of environment-related topics and their scientific background.

- 2. Radio:** Radio is an affordable, most common medium of information and its signals cover almost the entire nation. It is noteworthy that the Ministry of Environment & Forests used to broadcast two weekly programs on the environment, "*Kinare-Kinare*" and "*Aao Dilli Savaren*" on Delhi FM. At the national level, the news on environmental aspects is scant and if they are broadcast, they are most often at the regional level.
- 3. Community Media:** With the integration of media with community-based initiatives, community radio, and video have opened doors for the remote population to not only participate but also initiate dialogues regarding their regional environmental concerns. Community media also gives them the freedom to deliberate on environmental protection activities for the conservation and regeneration of natural ecosystems.

Henvalvani Community Radio (Chamba, Uttarakhand) has been extensively producing programmes on the environment and climate change in the region.

4. **Television:** Studies indicate that television, by virtue of its audio-visual elements, enables a greater retention tendency among the viewers. As a result, the government is increasingly interested in allocating prime time slots to environmental programs on television. Presently, documentaries that revolve around the environment attract fewer viewers, maybe because of the academic or obscure manner in which they are presented. Mainstream channels such as the Discovery Channel, National Geographic, and Animal Planet broadcast exclusively on endangered species and wildlife, sea life, among other ecological aspects, etc. Programs like “Virasat”, “Race to Save the Plant”, the quiz show “Terraquiz”, and “Earth” was telecast by the Ministry of Environment & Forest in collaboration with Doordarshan. In addition, BBC’s “Earth Report” offers interesting pieces of information on the environment. In fact, reruns of “The New Adventures of Captain Planet” on Cartoon Network cater to the younger population of children and sensitize them about deforestation, pollution, poaching, and other environmental hazards.
5. **New Media:** The Internet’s exponential reach and easy accessibility make it the prime resource for the global population to seek information about climate change, environmentalism, and how to be green and eco-friendly. Nowadays, Internet services are more frequently utilized for environmental awareness among people to engage in public dialogue almost instantaneously. Social media sites such as Twitter, Facebook, etc. share news, information, and articles and are thus, most resourceful for concerned “netizens” to keep abreast of environmental issues. The Internet has also created spaces for the convergence of traditional media with new media, in order to produce an eclectic and multifaceted resource for people to gain indigenous knowledge about environmentalism. Furthermore, with the advent of mobile applications using different strategies to provide people with a sense of ownership of the planet, a search engine “Ecosia”, ensures its users spend 100% of its profits on planting trees in suggested locations.

Describing some of the things that contemporary environmental journalism encompasses, we can put together an outline that will help us formulate a working definition:

#### **4.5 ENVIRONMENTAL JOURNALISM IS ABOUT HUMANS’ INTERACTION WITH THEIR OWN HABITAT**

This means environmental journalism covers stories pertaining to the natural world and humans’ impact on it. Conversely, this also includes the impact the environment can have on humans, particularly when that environment is degraded by human activity.

##### **i. Environmental journalism is inherently political:**

Environment-related events can often be related to policy-making. Reporting on the environment must therefore include and interpret politically driven perspectives on environmental issues. As we will see as this text progresses, this means environmental journalism is often divided by an advocacy/neutrality debate.

##### **ii. Environmental journalism is global as well as local:**

Environment stories can be as large-scale as global warming; they can be international, for example, one country’s pollution affecting its neighbour; or they can be entirely local in focus, for example, localized conflict over the site of a new water pipe or dam. However, in a

globalized world local and global are now rarely separate. Instant global communications networks mean local conflicts quickly become globally recognized and protested. Also, international finance is often involved in local environmental conflicts, for example, a multinational mining company proposing a new, highly contested mining project in a foreign country.

**iii. Environmental journalism is driven by the environmental movement and by organizations that impact most on the environment:**

The development of environmental journalism as a genre has corresponded closely with the development of the environmental movement. The stories that become environmental news today are often driven by environmental protests or environmental advocacy groups. Likewise, organizations whose actions put the environment at risk engage in their own environmental communication (public relations). Environmental journalism must navigate this complex communications environment skilfully in order to produce effective stories on the environment.

**iv. Environmental journalism is about the perception and communication of risk and crisis:**

The competition for risk definition and risk communication is inherent in environmental journalism. A struggle for control between those generating environmental risk and those perceiving it is played out in most journalism related to the environment. Journalists writing on environmental issues must understand risk definition and risk perception in order to adequately communicate risk. Environmental journalists are also often called upon to communicate fast-moving stories about environmental crises.

**v. Environmental journalism is often akin to science writing:**

Environmental journalism often involves interpreting complex scientific research for a lay audience. A journalist writing on the environment must be skilled in communicating complexity clearly, without ‘dumbing down.’

**vi. Environmental journalism typically includes stories with an extended life span:**

Much news today appears and disappears rapidly. Environmental stories often play out over an extended period of time. Environmental journalism needs to keep presenting new facets of an environment-related story in order to keep a story on the media’s news agenda.

Being all of these things, environmental journalism is therefore a particularly multifaceted and complex genre of journalism, which covers a broad range of socio-political, technical, and natural phenomena. In any one week or month media coverage of the environment may therefore include natural and man-made environmental disasters, climate change, biodiversity and extinctions, pollution and its health effects, industry and its environmental impacts, food production safety, farming and animal welfare, occupational health, population growth, and issues related to sustainability.

A journalist writing on the environment therefore needs to keep abreast of a diverse range of news developments, scientific research, risk assessments, and political responses to all of these. Because of the longevity of most environmental stories, journalists also need to understand the historical unfolding of an environmental event or concern. And because complex environmental stories rarely conform to the quick minute-and-a-half news bite, environmental journalism tends to prefer feature-length pieces based on in-depth research. But in busy newsrooms following the 24/7 news cycle, journalists have ever less time, and media organizations are providing ever fewer resources for research.

By the nature of the stories it covers, environmental journalism also faces the challenge of being considered anti-business or anti-development. This intrinsically goes against the principles of corporate media which is a fundamental part of global commerce. In

many media landscapes, this means environment stories receive less attention than they should. And in some media landscapes—particularly where media ownership, business, and government are most closely linked—this may mean in-depth journalism on the environment is actively discouraged. We will see as this text progresses that this can pose significant challenges to environmental journalism in the mainstream media.

Environmental journalism today is therefore a highly intricate and multi-stranded sphere of the media. It draws on politics, science, business, development, and activism. It requires understanding both historical perspectives and the latest research. It is both in the broadest sense global and intensely local. It calls for understanding both risk and risk perception. It may also be conducted in a landscape where the powerful would rather that some environmental stories not be told.

#### **4.6 WHO REPORTS ON THE ENVIRONMENT?**

First, we might ask “Is there such a thing as an environmental journalist?” As a student of this course, your ultimate goal may be to report exclusively on the environment. Though larger media outlets may have a specialist environment reporter, contemporary journalists most often find they need to be multi-skilled and able to write on a variety of subjects. A journalist might report on the environment for some time, then be put on the science-writing desk. That journalist might then be transferred to reporting on agriculture, because of an important story he or she wrote on genetically modified crops when covering the environment. Those individuals who do manage to make a career of writing mainly on the environment may only work for a traditional media outlet (newspaper/magazine, television, radio) for part of their careers. They will probably crisscross between different forms of environmental communication. Let us consider here, then, who communicates on the environment:

##### **1. Environment reporters**

The largest media outlets (print and broadcast) may have an environment specialist, and a so-called ‘environment beat’ (i.e., a regular spot for reporting environment-related stories).

##### **1. Communications staff for environmental NGOs / advocacy organizations**

Environmental non-government organizations must communicate their positions on environment-based conflicts. They employ writers often journalists to fulfil this role. These kinds of roles may also be described as environmental public relations (PR).

##### **2. Government communications staff**

Government communications or PR staffs need to communicate government positions on environmental policy or responses to environment-related crises.

##### **3. 4. Freelance journalists**

Working as a freelancer means a journalist can create a specialist niche for himself or herself. A freelancer may be able to carve out a role as an environment expert for media outlets that don’t cover this role in-house.

##### **6. Social media-based activists/citizen journalists**

With the advent of social media, new forms of communications specialists have emerged. Environmental activists and citizen journalists use social media sites such as Facebook, Twitter, blogs, and photo-sharing media to report on environmental conflicts and lead environmental protests.

## 7. Photographers

As we will discover in Chapter 5 of this text, imagery is a powerful aspect of communicating with the environment. Photographers reporting from the front line of environmental conflicts supply imagery that can become symbolic of an environment. Image-makers have a crucial and persuasive role in environmental communications.

## 8. Documentary makers

Documentary can be considered as a form of advocacy journalism: it is rarely intended to be neutral. Documentaries usually intend to convince a viewer of a certain position. A documentary-like, most famously, Al Gore's *An Inconvenient Truth*, can be a highly influential form of environmental communication.

Environmental Journalism, then, is just one aspect of communicating about the environment. In this text, we are often able to include many of these diverse forms of environmental communication in our discussion. It is also important to consider these other strands of environmental communication because every environmental journalist will work with some or all of these other environmental communicators in the course of reporting environmental stories. Journalists reporting on the environment therefore do not work alone, and other environmental communicators may be some of their most important sources.

## 4.7 SUMMARY

Environmental journalism is the researching and reporting of complex and significant environmental issues for lay audiences. It covers stories pertaining to the natural world and humans' impact on it, as well as the impact a degraded environment can have on humans. It is inherently political, local in scale as well as global, and is influenced by the environment movement as well as by organizations that impact the environment most. Environmental journalism must communicate risk and be responsive to public perception of risk. And it plays a leading role among the media professions in communicating environmental crises. It must also distil often highly complex and uncertain scientific research for non-scientific readers. The stories that environmental journalism covers are typically drawn out, which means environmental journalism must keep reinventing or refreshing stories with new facts and facets to keep environmental issues on the news media's agenda.

Objectivity in terms of granting equal access to sources may not be appropriate in reporting a grisly murder, a terrorist attack, or genocide. In terms of environmental issues, attempts to report climate change 'objectively' by including the views of climate sceptics in reports of the subject probably enhanced inaccuracy, rather than objectivity. Five of the elements of framing are: a story's headline, language, source selection, quotes, and imagery. (Captions and those things outside the frame—i.e., exclusion—could also be listed.)

News values are often (but not always) described as these eight things: conflict (is there conflict inherent in the story?); impact (an event's degree of importance); proximity (the geographic closeness of the story to the intended audience); prominence (how well known the individuals/ institutions involved are); timeliness (how recent an occurrence is); currency (whether people are interested in this topic right now); human interest (where personal stories illustrate a news event) and novelty (things that are noteworthy because they are unusual or bizarre). (For the newspaper identification task, read through your daily local newspaper to try to identify stories that incorporate at least one, preferably several, of these news values.)

Environmental journalism can be regarded as being particularly suited to the advocacy reporting style. If the barriers that environmental issues face in accessing the news (and staying in it) are considered, it makes sense that environmental journalists and allied environmental communicators may want to adopt this style of reporting. Employing an advocacy style in reporting on the environment may help to counterbalance the often-anti-environmentalist/pro-business voices of the powerful that dominate the contemporary media.

The Fourth Estate refers to the media when it acts to scrutinize the government and ruling elites, holding those in power to account for their actions. The term comes from the 18th century British House of Commons where the journalists in the press gallery were considered to make up the 'fourth power' in British society, along with the other three 'estates or powers: the lords, the commons, and the clergy.

Budgets for investigative journalism on the environment have been reduced because audiences (particularly for newspapers) have become smaller since the advent of the internet. Also, environment stories are seen to be inherently in conflict with the pro-business values of corporate media which rely on advertising for existence. For this reason, investigative environmental journalism may receive reduced funding at the very least, if it is not actively discouraged.

Environmental journalism can be a dangerous profession in countries where media freedom, and therefore the safety of journalists to report on controversial environmental subjects, is not guaranteed.

Uzbek journalist Solidzhon Abdurakhmanov reported extensively on the links between authorities and the environmental disaster of the Aral Sea. He was arrested by police and tried on drug charges after prohibited drugs were apparently planted in his car. He is still in prison, serving a 10-year drug sentence.

#### 4.8. TECHNICAL TERMS

**Netizens:** Internet users/Browsers

**Advocacy:** Getting support from another person to help you express your views and wishes, and stand up for your rights.

**Citizen journalists:** Journalist that conducted by people who are not professional journalists but who disseminate information using websites, blogs and social media.

#### 4.9 SELF-ASSESSMENT QUESTIONS

1. Define Environmental Journalism.
2. What do you understand by Mass Media? What are its components?
3. Enlist the five functions of mass media towards the environment.
4. What are functions of Mass Media towards Environment?
5. How Environmental Journalism is about humans' interaction with their own habitat?

#### 4.10 SUGGESTED READINGS

1. Academic Accelerator Encyclopaedia
2. Acharya, K. & Noronha. F. (Eds). (2010).The Green Pen: Environmental Journalism in India and the South Asian Region. New Delhi, India. SAGE
3. Anderson, Alison. Media, Culture, Environment. Taylor and Francis, Inc., 1997. ISBN 1-85728-383
4. Bennett, W. L. & Entman, R. M. (Eds). (2001). Mediated Politics: Communication in the Future of Democracy. New York, NY: Cambridge University Press.
5. Charlotte Krolokke, & Annie Scott Sorensen (2005), Gender Communication: Theories and Analysis, Sage Publications.
6. Cox, R. (2010). Environmental Communication and the Public Sphere (2nded.). Thousand Oaks: Sage Publications
7. D.W. Burkett (1973): Writing Science News for the Mass Media, Gulf Publishing Company, Redas, Texas, USA
8. Flor, A. (2003). Environmental Communication Diliman, Quezon City: University of the Philippines-Open University.
9. H.O.Aggarwal (2000), International Law and Human Rights, Central Law Publications, Allahabad.
10. J.V.Vilani (1993) : Science Communication and Development, Sage Publishers,
11. L.Wallack, et.al. Media Advocacy and Public Health, Sage, London.
12. N.J. Wheeler &Tomothy Dunne (1999), Human Rights in Global Politics, Oxford, London.
13. Neusil, Mark, William Kovark. Mass Media and Environmental Conflict: America's Green Crusade. Thousand Oaks, London, and New Delhi: SAGE Publications, 1996. ISBN 0-7619-0333, New Delhi.
14. Pamela Creedon, Women Mass Communications
15. Robert Cox (2006), Environmental Communication and Public Sphere, Sage, London
16. West, Bernadette M., M. Jane Lewis, Michael R. Greenberg, David B. Sachsman, Renee M. Rogers. Reporter's Environmental Handbook. 3rd ed. New Brunswick and London: Rutgers University Press, 2003. ISBN 0-8135-3287-6

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# LESSON 5

## ENVIRONMENT: CAUSES AND FACTORS OF POLLUTION

### OBJECTIVES

After completing this chapter, you should be able to:

- Understand definition of Environmental pollution
- Learn the impact of environmental change.
- Acquire knowledge about Solutions to Minimise Environmental Pollution
- Know the Constitutional and Legal Provisions in India

### Structure

- 5.1 Introduction**
- 5.2 Environmental Pollution Definition**
- 5.3 Pollution of the Environment**
- 5.4 Causes of Environmental Pollution**
- 5.5 Impact of Environmental Change**
- 5.6 Solutions to Minimise Environmental Pollution**
- 5.7 Constitutional and Legal Provisions in India**
- 5.8 Historical Overview**
- 5.9 The Constitution of India and Environment**
- 5.10 Summary**
- 5.11 Technical Terms**
- 5.12 Self-Assessment Questions**
- 5.13 Suggested Readings**

### 5.1 INTRODUCTION

Pollution is defined as any undesirable and unwanted change in the proportions of these components. With each passing year, this problem becomes more serious. It's a problem that causes financial, physical, and social problems. The environmental problem, which is worsening by the day, must be tackled to eliminate its adverse impacts on humanity and the earth.

An organism's habitat is its immediate surroundings. An organism's habitat is made up of many components such as air, water, land, and so on. These elements are found in specific amounts to maintain a harmonious equilibrium in the organism's surroundings. Pollution is defined as any undesirable and unwanted change in the proportions of these components. With each passing year, this problem becomes more serious. It's a problem that causes financial, physical, and social problems. The environmental problem, which is worsening by the day, must be tackled to eliminate its adverse impacts on humanity and the earth.

### 5.2 ENVIRONMENTAL POLLUTION DEFINITION

Environmental pollution is any addition of erroneous substances or energies to the environment that causes a change to the composition of the environment. These variables can



be air, water, soil, noise, and light, and changes to their natural values can have profound consequences for ecosystems and human life.

### 5.3 POLLUTION OF THE ENVIRONMENT

With the growth of industry and the migration of people from villages to cities in pursuit of work, the problem of suitable housing and unsanitary living conditions has become increasingly prevalent. These elements have resulted in pollution-causing factors.

There are five types of environmental contamination: air, water, soil, and noise pollution.

#### **i. Air Pollution:**

In today's world, air pollution is a big problem. The air we breathe is contaminated by smoke from industry chimneys and automobiles. This smoke emits gases like carbon dioxide, carbon monoxide, and sulphur dioxide, which mix with the air and inflict significant harm to the human body, vegetation, and fauna. Our villages' domestic fuels, such as dry farm waste, dry grass, leaves, and coal, emit dangerous fumes. An overabundance of sulphur dioxide in the air causes acid rain.

The following are the primary sources of air pollution:

- Pollution caused by automobiles
- Air pollution caused by industry
- Garbage burning
- Kilns for making bricks
- Pollution of indoor air
- Animals and vegetation that have decomposed
- Elements those are radioactive

#### **ii. Water Pollution:**

One of the most important environmental challenges is water pollution. Waste products from increasing industries and sewage water are not properly processed before being discharged into rivers and other bodies of water, resulting in water contamination. Pollution of water bodies is also caused by agricultural practices that use excessive fertilizers and pesticides.

The following are the main sources of water pollution:

- Transportation via sea.
- Industrial wastes that end up in the seas and oceans.
- Disposal of radioactive materials in seawater.
- Rivers dispose of sewage into the sea.
- Oil rigs off the coast.
- Recreational pursuits
- Agricultural contaminants are dumped into bodies of water.

#### **iii. Soil or Land Pollution:**

Deposition of solid waste, built-up of biodegradable material, deposition of compounds with hazardous chemical compositions, and other forms of pollution on open land cause soil or land pollution. Land pollution and soil infertility are caused by waste products such as plastics, polythene, and bottles. Furthermore, the dumping of animal carcasses exacerbates the problem. Cholera, dysentery, typhoid, and other diseases are caused by soil contamination in humans and animals.

The following are the primary causes of soil pollution:

- Waste from industry
- Commercial and household garbage in cities
- Fertilizers with chemicals
- Medical and biomedical waste
- Pesticides

#### **iv. Noise Pollution:**

As the world's population, urbanization, and industrialization grow, noise pollution is becoming a severe form of pollution that affects people's lives, health, and daily comfort. Noise pollution is caused by vehicle horns, loudspeakers, music systems, and industrial activity.

The following are the main sources of noise pollution:

- Whistling, crunching, and thunderous sounds are produced by machines in factories and industries.
- Vehicle horns, loudspeakers
- Construction sites include rock and earth blasting, tube well drilling, ventilation fans, and heavy earth-moving machines.

### **5.4 CAUSES OF ENVIRONMENTAL POLLUTION**

#### **i. Deforestation**

Deforestation refers to the cutting down of trees and the destruction of forests. These can either be for human habitation and use or for natural causes. Deforestation has a tremendous negative impact on the environment. The most dramatic effect is a loss of trees and forests, which drives climate change, and several other problems have been raised for the ecosystem.

#### **ii. Solid Waste Pollution**

Solid waste pollution is also referred to as a type of pollution, along with air, water, noise, and soil pollution. Solid waste pollution refers to the improper disposal of solid waste, including garbage, construction waste, metal pieces, glass and plastic products, dead and decaying matter, solid agricultural waste, medical waste, radioactive waste, etc.

#### **iii. Global Warming**

The phenomenon of a gradual increase in the average temperature of the Earth's atmosphere and its water bodies is termed global warming. The leading cause for this environmental issue is the increased volumes of greenhouse gases, such as carbon dioxide and methane released by burning fossil fuels, emissions from vehicles, industries, and other human activities.

#### **iv. Change in Climatic Conditions**

There are several causes of climate change. The most significant effect on the climate is the increasing trend in the concentration of greenhouse gases and global warming in the atmosphere. Climate change is having an adverse impact on the environment. These include the physical, chemical, and biological characteristics of ecosystems.

Other than natural disasters, humans are also responsible for climate change. The burning of fossil fuels and emissions from vehicles, and industries are a few of them.

A change in the global climate includes:

- Typhoons
- Rising temperature

- An average to more rainfall
- Melting of global ocean currents and lots more.

## 5.5 IMPACT OF ENVIRONMENTAL CHANGE

Environmental change is also a source of climate pollution. It also affects the physical and organic parts of the environment. Ozone layer depletion, the release of ozone-depleting substances, and an increase in temperatures across the Earth are examples of natural pollution. Since these water bowls eventually connect to the ocean, they are implicitly polluting the ocean's biodiversity. Furthermore, their results can be deadly in the future. The erratic cold and harsh environment affects the normal backdrop of the world.

### Pollution's Effects on Human Health and the Environment

Environmental pollution has a direct and indirect impact on the lives of humans and other animals. These biological species have coexisted with humans on the globe for ages.

#### i. Environmental Effects

When carbon and dust particles in the air bind together, smog forms, producing respiratory issues, haze, and smoke. The burning of fossil fuels in industrial and manufacturing facilities, as well as automobile combustion of carbon fumes, produce these.

Furthermore, these characteristics have an impact on birds' immune systems, making them virus and disease carriers. It has an effect on the body's systems and organs as well.

#### ii. Effects on the Land, Soil, and Food

The deterioration of organic and chemical waste by humans has a negative impact on the land and soil. It also emits pollutants into the environment, both on land and in the water. Land and soil contamination are mostly caused by pesticides, fertilizers, soil erosion, and crop leftovers.

#### iii. Water-related effects

Any pollutant, whether human waste or factory chemical discharge, can easily contaminate water. This water is also used for crop irrigation and drinking. As a result of infection, they, too, become filthy. In addition, an animal dies after drinking the same polluted water.

Furthermore, almost 80% of pollutants from the land, such as chemical, industrial, and agricultural waste, end up in water bodies. Furthermore, because these water basins eventually connect to the sea, they pollute the biodiversity of the sea indirectly.

#### iv. Reaction to Food

As a result of contaminated soil and water, crops and agricultural produce become poisonous. From the beginning of their lives until harvest, when they reach a mass level, these crops are laced with chemical components. As a result, polluted food affects our health and organs.

#### v. The Effects of Climate Change

Climate change is a pollutant in the environment as well. It also has an effect on the physical and biological components of the environment.

Environmental contamination includes ozone depletion, greenhouse gas emissions, and global warming. These water basins pollute the sea's biodiversity indirectly because they eventually connect to the sea. In addition, the ramifications of their actions may be disastrous for future generations. The natural system of the planet is impacted by unpredictable cold and hot temperatures.

Earthquakes, famine, smog, carbon particles, shallow rain or snow, thunderstorms, volcanic eruptions, and avalanches are all caused by climate change, which is totally due to pollution.

#### **vi. Agriculture**

Overuse of fertilizers can break down agro ecosystems. Some wild plants will be unable to survive in a high-nutrient environment and local aquatic ecosystems may be affected. Therefore, the agro ecosystem will function less effectively causing crops to be more susceptible to disease, while irrigation of nearby waters will be negatively impacted. The use of unnatural pesticides will contaminate soils and disrupt interspecies dynamics within the ecosystem. Overgrazing of pastures can restrict the ecological succession of soils.

#### **vii. Human Health**

Dangerous particulates released from industry and vehicles (soot, dust, metals) can damage human respiratory systems and cause cancer. The release of CFCs into the atmosphere depletes the ozone layer meaning that more ultraviolet radiation reaches the Earth. UV radiation increases the chance of genetic mutation and eye defects. Drinking polluted water can cause cholera, typhoid, and hepatitis A in humans, whereas using polluted water for washing can cause skin irritation and fluorosis when brushing teeth with it. Polluted soils can result in disease spreading in agricultural produce. If this disease is not noticed, it can spread between human populations.

#### **viii. Degradation**

The rate at which pollutants degrade is important because they will often release poisonous chemicals and toxins as they are broken down. Here are some factors that affect the rate of degradation:

Temperature: decomposing microorganisms will break down matter much quicker in warmer conditions. They will release vast amounts of nutrients and poisonous toxins.

Moisture: microorganisms thrive in moist conditions too so decomposition rates will be high.

pH: the presence of alkaline substances in the soil can help to neutralize acidic soils caused by acid deposition. Microorganisms work faster at specific pH as well.

Oxygen availability: aerobic decomposers are much more efficient at breaking down matter than anaerobic ones, and require a consistent supply of oxygen to survive.

### **5.6 SOLUTIONS TO MINIMISE ENVIRONMENTAL POLLUTION:**

Some preventive measures need to be taken to minimize this issue. To save the environment, use the principle of the 3 R's; Reuse, Reduce, and Recycle.

- Reuse products again and again. Instead of throwing away things after one use, find a way to use them again.
- Reduce the generation of waste products.
- Recycle: Paper, plastics, glass, and electronic items can be processed into new products while using fewer natural resources and less energy.
- To prevent and control air pollution, better-designed equipment, and smokeless fuels should be used in homes and industries. More and more trees should be planted to balance the ecosystem and control greenhouse effects. Noise pollution can be minimized by better design and proper maintenance of vehicles. Industrial noise can be reduced by soundproofing equipment like generators, etc.

We must stop the usage of plastic to control soil pollution Sewage should be treated properly before using it as fertilizers and as landfills. Encourage organic farming as this

process involves the use of biological materials and avoiding synthetic substances to maintain soil fertility and ecological balance. Several measures can be adopted to control water pollution. Some of them are water consumption and usage which can be minimized by altering the techniques involved. Water should be reused with treatment.

Governments emphasize the need to plant more trees, minimize the use of plastics, improve natural waste recovery, and reduce pesticide use. This ecological way of living has helped humanity save other creatures from extinction while making the Earth a greener and safer ecology.

## **5.7 CONSTITUTIONAL AND LEGAL PROVISIONS IN INDIA**

Environmental protection is part of our cultural values and traditions. In Atharvaveda, it has been said that “Man’s paradise is on earth; this living world is the beloved place of all; It has the blessings of nature’s bounties; live in a lovely spirit”. Earth is our paradise and it is our duty to protect our paradise. The constitution of India embodies the framework of protection and preservation of nature without which life cannot be enjoyed. The knowledge of constitutional provisions regarding environmental protection is the need of the day to bring greater public participation, environmental awareness, and environmental education, and sensitize the people to preserve ecology and the environment.

A rapid increase in global warming, deforestation, air, water, and other forms of pollution is posing a great threat to the environment and its living beings. The degradation of the environment through a plethora of activities carried on by individuals is detrimental to the health of all living beings, including human beings, plants, and animals.

### **Environmental Laws and Constitutional Provisions in India**

It is interesting to note that natural resources have been stored virtually untouched on the Earth for millions of years. But since the start of the industrial revolution, vast amounts of these resources have been exploited within a period of just a couple of hundred years at unimaginable rates, with all the waste from this exploitation going straight into the environment (air, water, land) and seriously damaging its natural processes. Although pollution had been known to exist for a very long time (at least since people started using fire thousands of years ago), it had seen the growth of truly global proportions only since the onset of the Industrial Revolution during the 19th century.

Environmental degradation in India has been caused by a variety of social, economic, institutional, and technological factors. Rapidly growing population, urbanization, and industrial activities have all resulted in considerable deterioration in the quality and sustainability of the environment. Environmental ethics have also formed an inherent part of Indian religious precepts and philosophy.

The importance of the Judiciary in a democratic setup for the protection of life and personal rights can hardly be overestimated. India has a highly developed judicial system with the Supreme Court having plenary powers to make any order for doing complete justice in any cause or matter and a mandate in the Constitution, to all authorities, Civil and Judicial, in the territory of India to act in aide of the Supreme Court. The scope of Writ Jurisdiction of the High Courts is wider than traditionally understood and the judiciary is separate and independent of the executive to ensure impartiality in the administration of justice.

In considering the role of the judiciary in environmental governance, there are two issues that need to be considered. The first is the role of the judiciary in the interpretation of environmental law and in law-making and the second is the capability of jurists to effectively interpret the increasingly cross-linked issues brought to their attention.

## 5.8 HISTORICAL OVERVIEW

The Environment Protection Act 1986 defines the environment as “environment includes water, air and land and the inter-relationship which exists among and between water, air and land, and human beings, other living creatures, plants, microorganisms, and property.” Besides the physical and biological aspects, the “environment” embraces the social, economic, cultural, religious, and several other aspects as well. The environment, thus, is an amalgamation of various factors surrounding an organism that interact not only with the organism but also among themselves. It means the aggregation of all the external conditions and influences affecting the life and development of organs of human beings, animals, and plants.

### 1. Policy and Laws in Ancient India

In ancient India, protection and cleaning up of the environment was the essence of the Vedic culture. The conservation of the environment formed an ardent article of faith, reflected in the daily lives of the people and also enshrined in myth folklore, art, culture, and religion. In Hindu theology forests, trees, and wildlife protection hold a place of special reference.

### 2. Policy and Laws in British India

By around 1860, Britain had emerged as the world leader in deforestation, devastation of its own woods, and the forests of Ireland, South Africa, and the north-eastern United States to draw timber for shipbuilding, iron-smelting, and farming. In the early nineteenth century, the Raj carried out a fierce onslaught on the subcontinent's forests. The revenue orientation of the colonial land policy also worked towards the denunciation of forests.

The Imperial Forest Department was formed in 1864, with the help of experts from Germany, the country which was at the time the leading European nation in forest management. The first inspector-general of forests, Dietrich Brandish, had been a botanist and recognized the awesome task of checking the deforestation, forging legal mechanisms to assert and safeguard states' control over the forests. It was his dual sense that the railway constituted the crucial watershed with respect to the water management in India- the need was felt to start an appropriate department, and for its effective functioning legislation was required to curtail the previously untouched access enjoyed by the rural communities.

### 3. Policy and Laws post-independence of India:

The Indian Constitution, as adopted in 1950, did not deal with the subject of the environment or prevention and control of pollution as such (until the 1976 Amendment). The original text of the constitution under Article 372(1) has incorporated the earlier existing laws into the present legal system and provides that notwithstanding the repeal by this constitution of the enactment referred to in Article 397, but subjected to the other provisions of the constitution, all laws in force immediately before the commencement of the constitution shall remain in force until altered, repealed or amended by a competent legislature or other competent authority. As a result, even after five decades of independence. The plethora of such laws is still in operation without any significant changes in them.

### 4. The Principles on Environment

With a view to protecting and improving the environment, different legislations have been made and different regulations and rules have been issued. The Government of India, through its Ministry of Environment and Forests, is administering has enacted nationwide comprehensive laws.

1972 Stockholm Declaration affirms that "Man has the fundamental right to freedom, equality and adequate conditions of life, in an environment of a quality that permits a life of dignity and well-being, and he bears a solemn responsibility to protect and improve the environment for present and future generations..." This shows that it has been internationally recognized that man's fundamental rights embrace the need to live in an uncontaminated environment but it also puts forth man's obligation to protect the environment for posterity. The Supreme Court has laid down that the "Precautionary principle" and the "Polluter Pays Principle" is essential features of "sustainable development". These concepts are part of the environmental law of the country.

The "Precautionary Principle" establishes that a lack of information does not justify the absence of management measures. On the contrary, management measures should be established in order to maintain the conservation of the resources. The assumptions and methods used for the determination of the scientific basis of the management should be presented.

**The essential ingredients of the precautionary principle are:**

- (i) Environmental measures- by the state government and the statutory authorities- must anticipate, prevent, and attack the causes of environmental degradation.
- (ii) When there are threats of serious and irreversible damage, lack of scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
- (iii) The "Onus of Proof" is on the actor or the developer/industrialist to show that his action is environmentally benign.
- (iv) Precautionary duties must not only be triggered by the suspicion of concrete danger but also by concern or risk potential.

In *M.C. Mehta v Union of India (CNG Vehicle Case)* (AIR 2002 SC 1696)

The Supreme Court observed that any 'auto-policy' framed by the Government must, therefore, of necessity conform to the constitutional principles as well as overriding statutory duties cast upon the government under the EPA. The auto policy must adopt 'precautionary principles' and make informed recommendations that balance the needs of transportation with the need to protect the environment.

The "polluter pays" principle came about in the 1970s when the importance of the environment and its protection was taken in the world over. It was subsequently promoted by the Organization for Economic Cooperation and Development (OECD). The 'polluter pays' principle as interpreted by the Court means that the absolute liability for harm to the environment extends not only to compensate the victims of pollution but also the cost of restoring the environmental degradation.

In other words, the Polluter should bear the cost of pollution as the polluter is responsible for pollution. The principle demands that the financial costs of preventing or remedying damage caused by pollution should lie with the undertakings that cause pollution. It may be noted that the polluter pays principle evolved out of the rule of 'absolute liability' as laid down by the apex court in the *Sriram Gas Leak Case*.

## **5.9 THE CONSTITUTION OF INDIA AND ENVIRONMENT.**

To protect and improve the environment is a constitutional mandate. It is the commitment of a country wedded to the ideas of a welfare State. The Indian constitution contains specific provisions for environmental protection under the chapters of Directive Principles of the State Policy and Fundamental Duties. The absence of any specific provision

in the Constitution recognizing the fundamental right to (a clean and wholesome) environment has been set off by judicial activism in recent times.

### **i. Article 48A and 51 (A)(g)**

A global adaption consciousness for the protection of the environment in the seventies prompted the Indian Government to enact the 42nd Amendment (1976) to the Constitution. The said amendment added Art. 48A to the Directive Principles of State Policy. It Declares: - “The State shall endeavour to protect and improve the environment and to safeguard the forests and wildlife of the country”.

A similar responsibility is imposed upon on every citizen in the form of Fundamental Duty –

### **ii. Art. 51(A) (g)**

“To protect and improve the natural environment including forest, lakes, rivers, and wildlife and to have compassion for living creatures”.

The amendments also introduced certain changes in the Seventh Schedule of the Constitution. ‘Forest’ and ‘Wildlife’ were transferred from the State List to the Concurrent List. This shows the concern of Indian parliamentarians to give priority to environmental protection by bringing it to the national agenda. Although unenforceable by a court, the Directive Principles are increasingly being cited by judges as complementary to fundamental rights. In several environmental cases, the courts have been guided by the language of Art. 48A. and interpret it as imposing “an obligation” on the government, including courts, to protect the environment.

In *L.K Kollwal Vs State of Rajasthan*, a simple writ petition by citizens of Jaipur compelled the municipal authorities to provide adequate sanitation. The court observes that when every citizen owes a constitutional duty to protect the environment (Art.51A), the citizen must be also entitled to enlist the court’s aid in enforcing that duty against recalcitrant State agencies. The Court gave the administration six months to clean up the entire city and dismissed the plea of lack of funds and staff.

The Public Trust Doctrine evolved in *M.C. Mehta vs. Kamal Nath*, which states that certain common properties such as rivers, forests, seashores, and the air were held by the Government in Trusteeship for the free and unimpeded use of the general public. Granting a lease to a motel located at the bank of the River Beas would interfere with the natural flow of the water and the State Government had breached the public trust doctrine.

A matter regarding vehicular pollution in Delhi city, in the context of Art 47 and 48 of the Constitution came up for consideration in *M.C. Mehta vs. Union of India (Vehicular Pollution Case)*. It was held to be the duty of the Government to see that the air did not become contaminated due to vehicular pollution. The Apex court again confirmed the right to a healthy environment as a basic human right and stated that the right to clean air also stemmed from Art 21 which referred to the right to life. This case has served to be a major landmark because of which lead-free petrol supply was introduced in Delhi. There was a complete phasing out of old commercial vehicles more than 5 years old as directed by the courts. Delhi owes its present climatic conditions to the attempt made to maintain clean air.

### **iii. The Ganga Water Pollution case: M C Mehta Vs. Union of India, AIR 1988, SC 1037**

The owners of some tanneries near Kanpur were discharging their effluents from their factories in Ganga without setting up primary treatment plants. The Supreme Court held that the financial capacity of the tanneries should be considered irrelevant while requiring them to establish primary treatment plants. The Court directed to stop the running of these tanneries and also not to let out trade effluents from the tanneries either directly or indirectly into the



river Ganga without subjecting the trade effluents to a permanent process by setting up primary treatment

In the very recent case of T.N. GodavarmanThirumulpad vs. Union of India, a case concerning the conservation of forests, Justice Y.K. Sabharwal, held: Considering the compulsions of the States and the depletion of forests, legislative measures have shifted the responsibility from States to the Centre. Moreover, any threat to the ecology can lead to a violation of the right to enjoy a healthy life guaranteed under Art 21, which is required to be protected. The Constitution enjoins upon this Court a duty to protect the environment.

#### **iv. Article 246**

Art.246 of the Constitution divides the subject areas of legislation between the Union and the States. The Union List (List I) includes defence, foreign affairs, atomic energy, interstate transportation, shipping, air trafficking, oilfields, mines, and inter-state rivers. The State List (List II) includes public health and sanitation, agriculture, water supplies, irrigation and drainage, and fisheries. The Concurrent list (List III) (under which both the State and the Union can legislate) includes forests, protection of wildlife, mines and minerals and development not covered in the Union List, population control, and factories. From an environmental standpoint, the allocation of legislative authority is an important one – some environmental problems such as sanitation and waste disposal, are best tackled at the local level; others, like water pollution and wildlife protection, are better regulated by uniform national laws.

#### **v. Article 253**

Art.253 of the Constitution empowers Parliament to make laws implementing India's international obligations as well as any decision made at an international conference, association, or other body. Art.253 states: Notwithstanding anything in the foregoing provision provisions of this chapter, Parliament has the power to make any law for the whole or any part of the territory of India for implementing any treaty, agreement, or convention with any other country or countries or any decision made at any international conference, association or other body. The Tiwari Committee in 1980 recommended that a new entry on "Environmental Protection" be introduced in the concurrent list to enable the centre to legislate on environmental subjects, as there was no direct entry in the 7th seventh enabled Parliament to enact comprehensive environmental laws. The recommendation, however, did consider parliament's power under Art.253

#### **vi. Article 14 and Article 19 (1) (g)**

ART. 14 states: "The states shall not deny to any person equality before the law or the equal protection of the laws within the territory of India." The right to equality may also be infringed by government decisions that have an impact on the environment. An arbitrary action must necessarily involve a negation of equality, thus urban environmental groups often resort to Art.14 to quash arbitrary municipal permission for construction that is contrary to development regulations.

#### **vii. Article 21**

(Right to Wholesome Environment)

"No person shall be deprived of his life or personal liberty except according to procedure established by law."

In *Maneka Gandhi vs Union of India*, the Supreme Court while elucidating on the importance of the 'right to life' under Art. 21 held that the right to life is not confined to mere animal existence, but extends to the right to live with the basic human dignity (Bhagwati J.)

Similarly, while interpreting Art.21 in the *Ganga Pollution Case* as discussed before, Justice Singh justified the closure of polluting tanneries and observed: "We are conscious that closure of tanneries may bring unemployment, loss of revenue, but life. Health and ecology have greater importance to the people."

### 5.10 SUMMARY

The powers vested in the Pollution Control Boards are not enough to prevent pollution. The Boards do not have the power to punish the violators but can launch prosecution against them in the Courts which ultimately defeat the purpose and object of the Environmental Laws due to long delays in deciding the cases. Thus, it is imperatively necessary to give more power to the Boards.

What we need is social awareness from below, not laws from the above. No law works out smoothly unless the interaction is voluntary. In order to educate people about environmental issues, there should be an exhibition of slides in the regional languages at cinema houses and television free of cost. Further, as directed by the Supreme Court of India in *M C Mehta Case (M C Mehta V Union of India 1992, SC 382)* school and college levels in a graded system so that there should be general growth of awareness.

### 5.11 TECHNICAL TERMS

**Global Warming:** The phenomenon of a gradual increase in the average temperature of the Earth's atmosphere and its water bodies is termed global warming.

**Agro ecosystem:** A simplified eco system subjected to exploitation for purposes of food and fibre production.

**Greenhouse gas emissions:** Greenhouse gases in the earth's atmosphere that trap heat. During the day, the sun shines through the atmosphere, warming the earth surface. At night the earth surface cools, releasing heat back into the air. But some of the heat is trapped by greenhouse gases in atmosphere.

### 5.12. SELF-ASSESSMENT QUESTIONS

1. What are Environmental Issues?
2. What are the major causes of environmental issues?
3. What are the practical measures taken to reduce environmental issues?
4. How is pollution affecting the environment?
5. What are the major causes of environmental pollution?
6. What are some types of environmental pollution?

### 5.13. SUGGESTED READINGS

1. Tiwari, H.N., *Environmental Law*, Allahabad Law Agency, (2007).
2. Mohanty, S.K., *Environment and Pollution Laws*, Universals Legal Manual, (2010).
3. *Scope and Limits of Environmental Law* by Divya Soni.
4. Ministry of Environment and Forest, govt. of India.
5. All India Bar Examination Preparatory Material.

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## LESSON 6

# ENVIRONMENTAL ACTS AND CLIMATE CHANGE

### OBJECTIVES

After completing this chapter, you should be able to:

- Understand the Environmental Laws in India
- Learn the causes of climate change
- Acquire knowledge about Solutions to UNO Specialized Agencies and Others
- Know the UN Climate Change Conferences

### Structure

- 6.1 Introduction**
- 6.2 Environmental Laws in India**
- 6.3 Earth Summits**
- 6.4 A new blueprint for international action on the environment**
- 6.5 Rio Summit 1992 – Important Outcomes**
- 6.6 Climate Change**
- 6.7 Causes of Climate Change**
- 6.8 Effects of Climate Change**
- 6.9 Funds, Programmes, Specialized Agencies and Others**
- 6.10 UN Specialized Agencies**
- 6.11 UN Contribution to the Environment**
- 6.12 UN Climate Change Conferences**
- 6.13 Summary**
- 6.14 Technical Terms**
- 6.15 Self-Assessment Questions**
- 6.16 Suggested Readings**

### 6.1 INTRODUCTION

Climate change's definition can be a broad term that encompasses long-term variations in temperature and weather patterns. These movements could be natural due to differences in the solar cycle. However, human actions have been the primary cause of climate change since the 1800s, mainly owing to the combustion of fossil fuels such as coal, oil, and gas. Climate change was recently seen in several cities in India, including Delhi, Hyderabad, and Chennai, which faced a water crisis and were forced to rely on alternate water supplies such as remote, unreliable public water pumps and expensive private water tankers.

### 6.2 ENVIRONMENTAL LAWS IN INDIA

#### **i. The Water (Prevention and Control of Pollution) Act 1974**

The Act prohibits the discharge of pollutants into water bodies beyond a given standard and lays down penalties for non-compliance with its provisions.

It set up the Central Pollution Control Board (CPCB) which lays down standards for preventing and controlling water pollution. At the state level, the State Pollution Control Board (SPCB) functions under the direction of the CPCB.

In Delhi Bottling Co. Pvt. Ltd. Vs. CPCB, AIR 1986 Del 152, it was found that the representatives of the board got the samples analysed from a non-recognized laboratory by the state. The court held that since section 21 was not complied with, the test results were inadmissible as evidence.

### **ii. The Air (Prevention and Control of Pollution Act, 1981)**

To implement the decision taken in the Stockholm Conference, the Parliament enacted the Air Act under Article 253.

It controls mainly air pollution and its abatement. Also establishes air quality standards.

The Central and State Boards set up under sections 16 and 17 independently notify emission standards. Every industrial operator within a declared air pollution area must obtain a permit from the State Board (Sec-21(1) and (2)).

Within four months from the date of application for the permit, the board must complete the formalities – either grant or refuse consent.

Power of the Boards:

- Power of entry and inspection
- Power to take samples
- Power to give directions

### **iii. Other important laws:**

1986 - The Environment (Protection) Act authorizes the central government to protect and improve environmental quality, control and reduce pollution from all sources, and prohibit or restrict the setting and /or operation of any industrial facility on environmental grounds.

1989 - The objective of Hazardous Waste (Management and Handling) Rules is to control the generation, collection, treatment, import, storage, and handling of hazardous waste.

1991 - The Public Liability Insurance Act and Rules and Amendment, 1992 was drawn up to provide for public liability insurance for the purpose of providing immediate relief to the persons affected by accident while handling any hazardous substance.

2000 - The Municipal Solid Wastes (Management and Handling) Rules, apply to every municipal authority responsible for the collection, segregation, storage, transportation, processing, and disposal of municipal solid wastes.

2002 - The Noise Pollution (Regulation and Control) (Amendment) Rules

Lay down such terms and conditions as are necessary to reduce noise pollution, and permit the use of loudspeakers or public address systems during night hours (between 10:00 p.m. to 12:00 midnight) on or during any cultural or religious festive occasion.

1927 - The Indian Forest Act and Amendment, 1984, is one of the many surviving colonial statutes. It was enacted to 'consolidate the law related to forest, the transit of forest produce, and the duty leviable on timber and other forest produce'.

1948 – The Factories Act and Amendment in 1987 was the first to express concern for the working environment of the workers. The amendment of 1987 has sharpened its environmental focus and expanded its application to hazardous processes.

## **6.3 EARTH SUMMITS**

The decennial meetings/ conferences/ conventions of the world leaders organized by the United Nations Organization (UNO) are commonly known as 'Earth Summits'. The main objectives of the UN earth summits are to bring together the national heads or their representatives and organizations at a common forum (i) to identify and update the issues/

challenges related to earth and its environment; (ii) to quantify them; (iii) to identify and look into probable solutions and remedial measures; and (iv) to develop an effective plan of action.

Initiated by the UNO, the first Earth Summit was organized in the year 1972 in Stockholm, Sweden. After that at a regular interval of 10 years the earth summits are being held, the last one in 2012 at Rio de Janeiro, Brazil.

### **The List of UN Earth Summits**

1. United Nations Conference on the Human Environment at Stockholm (UNCHS): The UNCHS was held from 5th to 16th June 1972 in Stockholm, Sweden. It was the UN's first major conference on global environmental issues. Leaders and representatives from 114 governments attended the conference. The action plan of the UNCHS contained 109 recommendations covering 6 broad issues. They were - (i) human settlement, (ii) natural resource management, (iii) pollution control, (iv) educational and social aspects of the environment, (v) environment and development, and (vi) the role of international organizations.
2. Earth Summit of Nairobi, Kenya: The second UN Earth summit was held at Nairobi, the capital city of Kenya, Africa from 10 to 18th May 1992. But on account of some political issues and the intervention of the USA, the Nairobi summit is not considered an Earth Summit.
3. United Nations Conference on Environment and Development (UNCED) at Rio de Janeiro: The third UN earth summit was held from 3rd to 14th June 1992 at the Brazilian city of Rio de Janeiro. Representatives of 178 governments, known as ratified parties attended the Rio Summit. The conference aimed to reassess economic development to preserve natural resources and discuss the problem of pollution. The major issues discussed at the Rio Summit include climate change, environmental conservation, global warming, and natural disaster management. The action plan of the 1992 Earth Summit is called 'Agenda 21'.
4. World Summit on Sustainable Development (WSSD) at Johannesburg: The fourth UN Earth Summit was organized from 26th August to 4th September in Johannesburg, Republic of South Africa. The declaration of the conference noted that population growth and economic development harm the environment, and thus advocated for the concept of sustainable development. It was also stated that every human has the right to a clean and healthy environment.
5. United Nations Conference on Sustainable Development (UNCSD) at Rio de Janeiro: The fifth and last earth summit was held from 20th to 22nd June 2012 once again at Rio de Janeiro,

## **6.4 A NEW BLUEPRINT FOR INTERNATIONAL ACTION ON THE ENVIRONMENT**

The United Nations Conference on Environment and Development (UNCED), also known as the 'Earth Summit', was held in Rio de Janeiro, Brazil, from 3-14 June 1992. This global conference, held on the occasion of the 20th anniversary of the first Human Environment Conference in Stockholm, Sweden, in 1972, brought together political leaders, diplomats, scientists, representatives of the media, and non-governmental organizations (NGOs) from 179 countries for a massive effort to focus on the impact of human socio-economic activities on the environment. A 'Global Forum' of NGOs was also held in Rio de Janeiro at the same time, bringing together an unprecedented number of NGO

representatives, who presented their own vision of the world's future in relation to the environment and socio-economic development.

The Rio de Janeiro conference highlighted how different social, economic, and environmental factors are interdependent and evolve together, and how success in one sector requires action in other sectors to be sustained over time. The primary objective of the Rio 'Earth Summit' was to produce a broad agenda and a new blueprint for international action on environmental and development issues that would help guide international cooperation and development policy in the twenty-first century.

The 'Earth Summit' concluded that the concept of sustainable development was an attainable goal for all the people of the world, regardless of whether they were at the local, national, regional or international level. It also recognized that integrating and balancing economic, social and environmental concerns in meeting our needs is vital for sustaining human life on the planet and that such an integrated approach is possible. The conference also recognized that integrating and balancing economic, social and environmental dimensions required new perceptions of the way we produce and consume, the way we live and work, and the way we make decisions. This concept was revolutionary for its time, and it sparked a lively debate within governments and between governments and their citizens on how to ensure sustainability for development.

One of the major results of the UNCED Conference was Agenda 21, a daring program of action calling for new strategies to invest in the future to achieve overall sustainable development in the 21st century. Its recommendations ranged from new methods of education to new ways of preserving natural resources and new ways of participating in a sustainable economy.

The 'Earth Summit' had many great achievements: the Rio Declaration and its 27 universal principles, the United Nations Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity; and the. The 'Earth Summit' also led to the creation of the Commission on Sustainable Development, the holding of the first world conference on the sustainable development of small island developing States in 1994, and negotiations for the establishment of the agreement on straddling stocks and highly migratory fish stocks.

## **6.5 RIO SUMMIT 1992 – IMPORTANT OUTCOMES**

This particular earth summit is popularly called the Rio+20 summit. The two basic themes were discussed at the summit - (i) how to build a green economy and (ii) how to improve global and international coordination for sustainable development. The Rio+20 summit included three principal objectives - (i) to secure political commitment for sustainable development; (ii) to assess the progress and gaps in meeting previous commitments; and (iii) to address new and emerging challenges.

The Rio Summit 1992 is also called the Earth Summit. This summit led to the development of the following documents:

1. Rio Declaration on Environment and Development
2. Agenda 21
3. Forest Principles

The first document called the Rio Declaration, in short, contained 27 principles that were supposed to guide countries in future sustainable development. Agenda 21 is an action plan concerning sustainable development, but it is non-binding. The Forest Principles is formally called 'Non-Legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Types of Forests. It makes many recommendations for conservation and sustainable development in forestry and is non-binding.

## 6.6 CLIMATE CHANGE

As you read this, a massive geologic experiment is underway. It is being conducted not by scientists in a lab, but by the seven billion people who call the earth home. As we go about our daily lives, we are all contributing, often unwittingly, to changes in the earth's atmosphere that could affect the way we live for generations to come. The periodic change in the Earth's weather pattern, which results in temperature rise and unpredictable weather patterns, is known as climate change.

What is climate change?

The temperature of the Earth is influenced by the energy that enters and exits the planet's atmosphere. The Earth gets warmed as solar energy is absorbed by the Earth. Earth cools when the sun's energy is dispersed back into space. Both natural and man-made variables have the potential to alter the Earth's energy balance.

The rate of climate change is determined by the underlying causal factors. This may occur gradually or fast, in part or in full, over a short or long period, on a regional or global scale. During the Jurassic Period, climate change, which resulted in the extinction of the dinosaurs due to the abrupt introduction of the cold climate, was swift and instantaneous.

1. The climate is a long-term process compared to the weather. Our world has gone through several changes over billions of years due to many naturally occurring forces. The various natural forces are ice age, variation in the sun's intensity, volcanic eruptions, naturally occurring greenhouse gas concentrations, glaciation, and so on.
2. The change which affects human activity directly or indirectly and modifies the configuration of the global atmosphere is called climate change. Over an approximate period, it also brings variability in the natural climate.
3. Climate change is referred to as a long-time change in weather. This change won't happen in a day.
4. Climate change harms warming trends. It also affects the pattern of rainfall, temperature, the pattern of wind, and snowfall.
5. Human activities such as deforestation and overconsumption of fossil fuels are also responsible for climate change.

Natural Constraints

Numerous natural factors can affect the Earth's climate. Ocean currents, continental drift, volcanoes, the Earth's tilt, comets, and meteorites are a few examples.

## 6.7 CAUSES OF CLIMATE CHANGE

Fossil fuels – coal, oil, and gas – are by far the largest contributor to global climate change, accounting for over 75% of global greenhouse gas emissions and nearly 90% of all carbon dioxide emissions.

As greenhouse gas emissions blanket the Earth, they trap the sun's heat. This leads to global warming and climate change. The world is now warming faster than at any point in recorded history. Warmer temperatures over time are changing weather patterns and disrupting the usual balance of nature. This poses many risks to human beings and all other forms of life on Earth.

#### **i. Generating power**

Generating electricity and heat by burning fossil fuels causes a large chunk of global emissions. Most electricity is still generated by burning coal, oil, or gas, which produces carbon dioxide and nitrous oxide – powerful greenhouse gases that blanket the Earth and trap the sun's heat. Globally, a bit more than a quarter of electricity comes from wind, solar and other renewable sources which, as opposed to fossil fuels, emit little to no greenhouse gases or pollutants into the air.

#### **ii. Manufacturing goods**

Manufacturing and industry produce emissions, mostly from burning fossil fuels to produce energy for making things like cement, iron, steel, electronics, plastics, clothes, and other goods. Mining and other industrial processes also release gases, as does the construction industry. Machines used in the manufacturing process often run on coal, oil, or gas; and some materials, like plastics, are made from chemicals sourced from fossil fuels. The manufacturing industry is one of the largest contributors to greenhouse gas emissions worldwide.

#### **iii. Cutting down forests**

Cutting down forests to create farms or pastures, or for other reasons, causes emissions, since trees, when they are cut, release the carbon they have been storing. Each year approximately 12 million hectares of forest are destroyed. Since forests absorb carbon dioxide, destroying them also limits nature's ability to keep emissions out of the atmosphere. Deforestation, together with agriculture and other land use changes, is responsible for roughly a quarter of global greenhouse gas emissions.

#### **iv. Using transportation**

Most cars, trucks, ships, and planes run on fossil fuels. That makes transportation a major contributor of greenhouse gases, especially carbon dioxide emissions. Road vehicles account for the largest part, due to the combustion of petroleum-based products, like gasoline, in internal combustion engines. But emissions from ships and planes continue to grow. Transport accounts for nearly one-quarter of global energy-related carbon dioxide emissions. And trends point to a significant increase in energy use for transport over the coming years.

#### **v. Producing food**

Producing food causes emissions of carbon dioxide, methane, and other greenhouse gases in various ways, including through deforestation and clearing of land for agriculture and grazing, digestion by cows and sheep, the production and use of fertilizers and manure for growing crops, and the use of energy to run farm equipment or fishing boats, usually with fossil fuels. All this makes food production a major contributor to climate change. And greenhouse gas emissions also come from packaging and distributing food.

#### **vi. Powering buildings**

Globally, residential and commercial buildings consume over half of all electricity. As they continue to draw on coal, oil, and natural gas for heating and cooling, they emit significant quantities of greenhouse gas emissions. Growing energy demand for heating and cooling, with rising air-conditioner ownership, as well as increased electricity consumption for lighting, appliances, and connected devices, has contributed to a rise in energy-related carbon dioxide emissions from buildings in recent years.

#### **vii. Consuming too much**



Your home and use of power, how you move around, what you eat, and how much you throw away all contribute to greenhouse gas emissions. So, does the consumption of goods such as clothing, electronics, and plastics. A large chunk of global greenhouse gas emissions are linked to private households. Our lifestyles have a profound impact on our planet. The wealthiest bear the greatest responsibility: the richest 1 per cent of the global population combined account for more greenhouse gas emissions than the poorest 50 per cent.

## **6.8 EFFECTS OF CLIMATE CHANGE**

### **i. Hotter temperatures**

As greenhouse gas concentrations rise, so does the global surface temperature. The last decade, 2011-2020, is the warmest on record. Since the 1980s, each decade has been warmer than the previous one. Nearly all land areas are seeing more hot days and heat waves. Higher temperatures increase heat-related illnesses and make working outdoors more difficult. Wildfires start more easily and spread more rapidly when conditions are hotter. Temperatures in the Arctic have warmed at least twice as fast as the global average.

### **ii. More severe storms**

Destructive storms have become more intense and more frequent in many regions. As temperatures rise, more moisture evaporates, which exacerbates extreme rainfall and flooding, causing more destructive storms. The frequency and extent of tropical storms is also affected by the warming ocean. Cyclones, hurricanes, and typhoons feed on warm waters at the ocean surface. Such storms often destroy homes and communities, causing deaths and huge economic losses.

### **iii. Increased drought**

Climate change is changing water availability, making it scarcer in more regions. Global warming exacerbates water shortages in already water-stressed regions and is leading to an increased risk of agricultural droughts affecting crops, and ecological droughts increasing the vulnerability of ecosystems. Droughts can also stir destructive sand and dust storms that can move billions of tons of sand across continents. Deserts are expanding, reducing land for growing food. Many people now face the threat of not having enough water on a regular basis.

### **iv. A warming, rising ocean**

The ocean soaks up most of the heat from global warming. The rate at which the ocean is warming strongly increased over the past two decades, across all depths of the ocean. As the ocean warms, its volume increases since water expands as it gets warmer. Melting ice sheets also cause sea levels to rise, threatening coastal and island communities. In addition, the ocean absorbs carbon dioxide, keeping it from the atmosphere. But more carbon dioxide makes the ocean more acidic, which endangers marine life and coral reefs.

### **v. Biological Diversity**

Climate change poses risks to the survival of species on land and in the ocean. These risks increase as temperatures climb. Exacerbated by climate change, the world is losing species at a rate 1,000 times greater than at any other time in recorded human history. One million species are at risk of becoming extinct within the next few decades. Forest fires, extreme weather, and invasive pests and diseases are among many threats related to climate change. Some species will be able to relocate and survive, but others will not.

Species in the tropical area are at greater risk, according to the World Wildlife Fund (WWF). As the temperature increases, the species starts to migrate to regions of lower temperature. So, the change in temperature forces the species to migrate. According to WWF, one-fifth of the endangered species could be facing a catastrophic loss of biodiversity. The marine ecology will be severely impacted. This may result in changes to the ocean's circulation, an

increase in the ocean's acid range, and a rise in carbon dioxide levels. This level of change affects corals and shell-forming animals.

#### **vi. Not enough food**

Changes in the climate and increases in extreme weather events are among the reasons behind a global rise in hunger and poor nutrition. Fisheries, crops, and livestock may be destroyed or become less productive. With the ocean becoming more acidic, marine resources that feed billions of people are at risk. Changes in snow and ice cover in many Arctic regions have disrupted food supplies from herding, hunting, and fishing. Heat stress can diminish water and grasslands for grazing, causing declining crop yields and affecting livestock.

#### **vii. More health risks**

Climate change is the single biggest health threat facing humanity. Climate impacts are already harming health, through air pollution, disease, extreme weather events, forced displacement, pressures on mental health, and increased hunger and poor nutrition in places where people cannot grow or find sufficient food. Every year, environmental factors take the lives of around 13 million people. Changing weather patterns are expanding diseases, and extreme weather events increase deaths and make it difficult for healthcare systems to keep up.

A temperature rise will also increase the air pollutants in the atmosphere. So many diseases may occur due to air pollutants. Climate change adversely affects human health. It also makes the earth's temperature unfavourable for humans. Increased heat waves and weather events also increase casualties. Climate change is also responsible for the spreading of disease. These diseases spread from one geological region to another.

#### **viii. Global Warming**

An increase in average atmospheric temperature on the earth's surface is referred to as global warming. Climate patterns are affected due to the effects of global warming in the troposphere. Global warming is mainly due to global activity of emission of greenhouse gases, by industries, vehicles, and many others.

#### **ix. Poverty and displacement**

Climate change increases the factors that put and keep people in poverty. Floods may sweep away urban slums, destroying homes and livelihoods. Heat can make it difficult to work in outdoor jobs. Water scarcity may affect crops. Over the past decade (2010–2019), weather-related events displaced an estimated 23.1 million people on average each year, leaving many more vulnerable to poverty. Most refugees come from countries that are most vulnerable and least ready to adapt to the impacts of climate change.

#### **x. The drift of the continents**

The continents as we know them now did not exist 200 million years ago. Instead, they developed millions of years ago when the landmass 'Pangaea' began progressively drifting apart owing to plate displacement. This drift also affected the climate, as it altered the physical characteristics of the landmass, its position, and the position of water bodies, altering the movement of ocean currents and winds, which affected the climate.

Today, the drift process continues; the Himalayan range rises by around 1 mm (millimetre) per year as the Indian landmass slowly but steadily approaches the Asian landmass.

#### **xi. Variation in the orbit of the Earth**

The distribution of sunlight reaching the Earth's surface is directly tied to the Earth's orbit. A little change in the Earth's orbit results in a change in the seasonal distribution across

the world. There are very few fluctuations in the annual average of sunshine. Still, significant changes in the regional and seasonal distribution can occur.

There are three forms of orbital fluctuations: variations in the eccentricity of the Earth, variations in the tilt angle of the Earth's rotational axis, and precession of the Earth's axis. When these factors combine, they form Milankovitch cycles, which significantly affect climate and are recognized for their link with glacial and interglacial eras. According to the IPCC, Milankovitch cycles were responsible for ice age cycles.

## **6.9 UNITED NATIONS**

The United Nations (UN) is an international organization founded in 1945. It is currently made up of 193 Member States. Its mission and work are guided by the purposes and principles contained in its founding Charter and implemented by its various organs and specialized agencies. Its activities include maintaining international peace and security, protecting human rights, delivering humanitarian aid, promoting sustainable development, and upholding international law.

The main organs of the UN are

1. The General Assembly,
2. The Security Council,
3. The Economic and Social Council,
4. The Trusteeship Council,
5. The International Court of Justice, and
6. The UN Secretariat.

## **26.10 FUNDS, PROGRAMMES, SPECIALIZED AGENCIES AND OTHERS**

### **UNICEF**

The United Nations Children's Fund (UNICEF), originally known as the United Nations International Children's Emergency Fund, was created by the United Nations General Assembly in 1946, to provide emergency food and healthcare to children and mothers in countries that had been devastated by World War II. In 1950, UNICEF's mandate was extended to address the long-term needs of children and women in developing countries everywhere. In 1953, it became a permanent part of the United Nations System, and the words "international" and "emergency" were dropped from the organization's name, though it retained the original acronym, "UNICEF".

### **UNFPA**

The United Nations Population Fund (UNFPA), formerly the United Nations Fund for Population Activities, is the United Nations sexual and reproductive health agency. Its mission is to deliver a world where every pregnancy is wanted, 'every childbirth is safe' and every young person's potential is fulfilled. In 2018, UNFPA launched efforts to achieve three transformative results, ambitions that promise to change the world for every man, woman and young person: Ending unmet need for family planning  
Ending preventable maternal death  
Ending gender-based violence and harmful practices

### **UNDP**

The United Nations Development Programme (UNDP) is the UN's global development network. UNDP was established in 1965 by the General Assembly of the United Nations. It provides expert advice, training and grants support to developing countries, with increasing emphasis on assistance to the least developed countries. The UNDP Executive

Board is made up of representatives from 36 countries around the world who serve on a rotating basis. It is funded entirely by voluntary contributions from member nations. UNDP is central to the United Nations Sustainable Development Group (UNSDG), a network that spans 165 countries and unites the 40 UN funds, programmes, specialized agencies and other bodies working to advance the 2030 Agenda for Sustainable Development.

### **UNEP**

The United Nations Environment Programme (UN Environment) is a global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the United Nations system. It was founded by UN General Assembly as a result of the United Nations Conference on the Human Environment (Stockholm Conference) in June 1972. UNEP and World Meteorological Organization (WMO) established Intergovernmental Panel on Climate Change (IPCC) in 1988 to assess climate change based on the latest science. Since its founding, the UNEP has played a key role for the development of multilateral environmental agreements (MEAs). The secretariats for the following nine MEAs are currently hosted by UNEP: Convention on Biological Diversity (CBD), Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Convention on the Conservation of Migratory Species of Wild Animals (CMS) Vienna Convention for the Protection of the Ozone Layer Minamata Convention on Mercury Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and Their Disposal Stockholm Convention on Persistent Organic Pollutants Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade.

### **UN Habitat**

United Nations Human Settlements Programme (UN-Habitat) is the United Nations programme working towards a better urban future. Its mission is to promote socially and environmentally sustainable human settlements development and the achievement of adequate shelter for all. It was established in 1978 as an outcome of the First UN Conference on Human Settlements and Sustainable Urban Development (Habitat I) in Vancouver, Canada, in 1976. 2 United Nations Conference on Human Settlements (Habitat II) in Istanbul, Turkey, in 1996, set the twin goals of the Habitat Agenda: Adequate shelter for all Development of sustainable human settlements in an urbanizing world.

### **WFP**

World Food Programme (WFP) is the leading humanitarian organization saving lives and changing lives, delivering food assistance in emergencies and working with communities to improve nutrition and build resilience. The WFP was established in 1963 by the FAO (The Food and Agriculture Organization) and the United Nations General Assembly.

## **6.11 UN SPECIALIZED AGENCIES**

The UN specialized agencies are autonomous organizations working with the United Nations. All were brought into a relationship with the UN through negotiated agreements.

**FAO:** In 1945, the Food and Agriculture Organization (FAO) was created In Quebec City, Canada, by the first session of the newly created United Nations. FAO is a specialized agency of the United Nations that leads international efforts to defeat hunger.

**ICAO:** Under the Chicago Convention, the International Civil Aviation Organization (ICAO) was established in 1944, as a UN specialized agency. It manages the administration and governance of the Convention on International Civil Aviation (Chicago Convention).

**IFAD:** The International Fund for Agricultural Development (IFAD) was established as an international financial institution in 1977 through United Nations General Assembly Resolution as one of the major outcomes of the 1974–World Food Conference.

**ILO:** The International Labour Organization (ILO) is a United Nations agency whose mandate is to advance social justice and promote decent work by setting international labour standards.

**IMF:** UN Monetary and Financial Conference (1944, also called Bretton Woods Conference), Bretton Woods, New Hampshire, United States was held to regulate the international monetary and financial order after the conclusion of World War II. It resulted in foundation of International Monetary Fund (IMF) in 1945.

**World Bank:** UN Monetary and Financial Conference (1944, also called Bretton Woods Conference), was held to regulate the international monetary and financial order after the conclusion of World War II. It resulted in foundation of IBRD in 1945. IBRD is the founding institution of World Bank.

**IMO:** The International Maritime Organization (IMO) – is the United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine and atmospheric pollution by ships.

**ITU:** International Telecommunication Union (ITU) is a specialized agency of the United Nations (UN) that is responsible for issues that concern information and communication technologies (ICT). It is the oldest among all the specialised agencies of UN. It was founded in 1865 and based in Geneva, Switzerland. It works on the principle of international cooperation between governments (Member States) and the private sector (Sector Members, Associates and Academia).

**UNESCO:** United Nations Educational, Scientific and Cultural Organization (UNESCO) was founded in 1945 to develop the “intellectual and moral solidarity of mankind” as a means of building lasting peace. It is located in Paris (France). In this spirit, UNESCO develops educational tools to help people live as global citizens free of hate and intolerance.

**UNIDO:** United Nations Industrial Development Organization (UNIDO) promotes industrial development for poverty reduction, inclusive globalisation and environmental sustainability.

**WHO:** The World Health Organization (WHO) is the United Nations’ specialized agency for health. It was established in 1948, and is headquartered in Geneva, Switzerland. It is an inter-governmental organization and works in collaboration with its Member States usually through the Ministries of Health.

**UNCTAD:** UNCTAD supports developing countries to access the benefits of a globalized economy more fairly and effectively. It helps to use trade, investment, finance, and technology as vehicles for inclusive and sustainable development.

**UNODC:** United Nations Office on Drugs and Crime (UNODC) is a global leader in the fight against illicit drugs and international crime. It was established in 1997 through a merger between the United Nations Drug Control Programme and the Centre for International Crime Prevention.

**UNHCR:** The office of the United Nations High Commissioner for Refugees (UNHCR) was created in 1950, during the aftermath of the Second World War, to help millions of Europeans who had fled or lost their homes.

**ESCAP:** United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) is the main economic and social development centre of the UN in the region, headquartered in Bangkok (Thailand) in 1947.

## 6.12 UN CONTRIBUTION TO THE ENVIRONMENT

Climate change is a global problem that demands a global solution. The Intergovernmental Panel on Climate Change (IPCC), which brings together 2,000 leading climate change scientists, issues comprehensive scientific assessments every five or six years.

- IPCC was established in 1988 under the auspices of the United Nations Environment Programme (UNEP) and the World Meteorological Organization for the purpose of assessing “the scientific, technical and socioeconomic information relevant for the understanding of the risk of human-induced climate change.

- UN Framework Convention on Climate Change (UNFCCC) provides foundation for UN members to negotiate agreements to reduce emissions that contribute to climate change and help countries adapt to its effects. (UNFCCC-1992 is an international environmental treaty adopted and opened for signature at the Earth Summit in Rio de Janeiro (Brazil) in 1992.)

- Global Environment Facility, which brings together 10 UN agencies, funds projects in developing countries.

Protecting the Ozone Layer: The UNEP and the World Meteorological Organization (WMO) have been instrumental in highlighting the damage caused to Earth's ozone layer.

- Vienna Convention for the Protection of the Ozone Layer-1985 provided the framework necessary to create regulatory measures for international reductions in the production of chlorofluorocarbons. Convention provided foundation for Montreal protocol.

- The Montreal Protocol-1987 is an international environmental agreement with universal ratification to protect the earth's ozone layer by eliminating the use of ozone-depleting substances (ODS) such as chlorofluorocarbons (CFCs) and halogens.

Kigali amendment (to the Montreal Protocol)-2016: was adopted to phase down the production and consumption of hydro fluorocarbons (HFCs) worldwide.

- Banning Toxic Chemicals: The Stockholm Convention on Persistent Organic Pollutants-2001 seeks to rid the world of some of the most dangerous chemicals ever created.

## 6.13 UN CLIMATE CHANGE CONFERENCES

The United Nations Framework Convention on Climate Change (UNFCCC) entered into force on 21 March 1994. Every year, countries that have joined the United Nations Framework Convention on Climate Change (UNFCCC) meet to measure progress and negotiate multilateral responses to climate change. Today, it has near-universal membership. Currently, there are 198 Parties (197 States and 1 regional economic integration organization) to the United Nations Framework Convention on Climate Change. The UNFCCC is a “Rio Convention”, one of three adopted at the “Rio Earth Summit” in 1992. Preventing “dangerous” human interference with the climate system is the ultimate aim of the UNFCCC. Read more about the Convention

Together with the Convention, the Kyoto Protocol and the Paris Agreement establish the institutional agreements for the climate change intergovernmental process. Read more about governing, process management, subsidiary constituted and concluded Bodies. The UNFCCC secretariat (UN Climate Change) is the United Nations entity tasked with supporting the global response to the threat of climate change.

The UN Climate Change Conferences are the foremost global forums for multilateral discussion of climate change matters; they serve as the formal meetings of the Conference of the Parties (COP) to the UNFCCC, the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP) and the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (the CMA). The COP meets every year, unless

the Parties decide otherwise. The first COP meeting was held in Berlin, Germany in March, 1995.

COPs have created global milestones for the climate movement, setting standards and advancing action, including on reducing carbon emissions, accelerating a global energy transition, and helping countries adapt and build resilience to compounding climate issues. COPs are crucial in bringing governments together while also mobilizing the private sector, civil society, industry and individuals to tackle the climate crisis.

COP26 took place in Glasgow from 31 October - 12 November 2021. Learn more about COP26 at the dedicated United Nations page, at the UN Climate Change COP26 page, and also at the host country website. COP27 takes place 6-18 November 2022 in Sharm el-Sheikh, Egypt.

#### 6.14 SUMMARY

Climate change with its adverse effects has reached our doorsteps. It is high time that humans act wisely, to be able to cope with the changes and take precautions to avoid disasters in future and save the environment. Despite having many short-comings, UN has played a crucial role making this human society more civil, more peaceful & secure in comparison to time of its origin at 2 World War. United Nations, being the world's largest democratic body of all nations, its responsibility towards humanity is very high in terms of building a democratic society, economic development of people living in acute poverty, & preserving the Earth's Ecosystem in concern with Climate Change.

#### 6.14 TECHNICAL TERMS

**Earth Summit:** A summit conference of 100 or more earth leaders debating global environmental and development issues.

**Agenda 21:** It is an action plan concerning sustainable development, but it is non-binding.

**Pangaea:** The ancient super continent, comprising all the present continents joined together, which began break up about 200 million years ago.

**Milankovitch cycles:** It describes the collective effects of changes in the earth's movements on its climate over thousands of years. The term was coined and named after the Serbian geophysicists and astronomer Milutin Milankovic.

#### 6.15 SELF-ASSESSMENT QUESTIONS

1. What are the main causes of climate change?
2. How does the greenhouse effect impact humans?
3. Can one survive short of the greenhouse effect?

#### 6.16 SUGGESTED READINGS

1. Tiwari, H.N., Environmental Law, Allahabad Law Agency, (2007).
2. Mohanty, S.K., Environment and Pollution Laws, Universals Legal Manual, (2010).
3. Scope and Limits of Environmental Law by Divya Soni.
4. Ministry of Environment and Forest, govt. of India.

# LESSON 7

## CITIZEN'S COMMUNICATION AND PUBLIC PARTICIPATION

### OBJECTIVES

After completing this chapter, you should be able to:

- Understand Citizen's Communication
- Learn the importance of public participation
- Acquire knowledge about in Better Decisions
- Know the environmental law

### Structure

- 7.1 Introduction
- 7.2 Citizen's Communication
- 7.3 What is Public Participation?
- 7.4 Why is Public Participation so Important?
- 7.5 The Ladder of Citizen Participation
- 7.6 The Forms and Functions of Participation
- 7.7 Selecting the Right Level of Public Participation
- 7.8 Benefits of Public Participation
- 7.9 Result in Better Decisions
- 7.10 Develop Community Capacity
- 7.11 Considerations for Successful Public Participation
- 7.12 Areas of Public Participatory
- 7.13 Public Participation in Environmental Governance
- 7.14 How is this related to environmental law?
- 7.15 Summary
- 7.16 Technical Terms
- 7.17 Self-Assessment Questions
- 7.18 Suggested Readings

### 7.1 INTRODUCTION

Communication is a crucial component in managing natural disasters, as it can aggravate or mitigate the impact of the crisis. Natural and emergent disasters such as hurricanes, mountain fires and large-scale epidemic diseases create complex and heavy communication and information demands. During emergencies, communication is especially challenging due to high levels of confusion and uncertainty, which in turn, magnify the demand for timely and accurate communication and information-sharing.

Public participation is a process, not a single event. It consists of a series of activities and actions by a sponsor agency over the full lifespan of a project to both inform the public and obtain input from them. Public participation affords stakeholders (those that have an interest or stake in an issue, such as individuals, interest groups, communities) the opportunity to influence decisions that affect their lives.



## 7.2 CITIZEN'S COMMUNICATION

Citizens want accurate and timely information, whereas local governmental agencies might be constrained in their information supply capacities, depending upon the situation. However, how citizens and agencies communicate during natural disasters has changed significantly because of rapid advancements in media and communication technologies. Some scholars suggest that this increased communication channel capacity during natural disasters helps in overcoming typical vulnerabilities and panic.

Fortunately, such perspectives are increasingly being challenged from below, as the empowering effects of alternative media and communication become more widely appreciated and as new methods and technologies become more accessible. Individuals, groups, communities, civil society organisations, and social movements are demonstrating the power of bottom – up, locally owned and controlled forms of media and communication. The methods include participatory video, community radio, multimedia centres, theatre-for-development, music, traditional and digital storytelling, the Internet, community television, mobile phones, and diverse forms of print media such as posters – often used explicitly within processes of strengthening participation, citizenship, empowerment, and social change.

Worldwide, there has been a steady growth and emerging sophistication of alternative, citizens', and community-based media and communication. These initiatives are gaining recognition for their role in processes of social and political change, and in challenging the structural causes of poverty and exclusion – by giving greater voice to those affected by inequalities. Such hopes are especially strong at a time when citizenship and accountability are high on the development agenda. Innovation and accessibility of new technologies has also fuelled interest, stimulating donor support for the use of alternative media and communication within both development and democratisation programmes.

## 7.3 WHAT IS PUBLIC PARTICIPATION?

Public participation can be any process that directly engages the public in decision-making and considers public input in making that decision. 'Public participation' refers to citizen involvement in public decision making. In different interpretations, 'public' may be either individuals or organized communities, and 'participation' may involve either observation or power. The phrase 'public participation' came into use to denote remedial efforts to involve inactive public or clients in government activity, but it can include autonomous public activities in the larger society, such as locality or community development, social planning, and social action. Arguments for public participation variously emphasize benefits to individuals, communities, organizations, and the society, including increased knowledge, authority, power, and problem-solving ability.

Public involvement is means to ensure that citizens have a direct voice in public decisions. The terms "public", "citizen" and "involvement" and "participation" are often used interchangeably. While both are generally used to indicate a process through which citizens have a voice in public policy decisions, both have distinctively different meanings and convey little insight into the process they seek to describe.

The purposes of public participation include communicating information, developing relationships, developing the capacity to act, and preserving or changing conditions. Public can exercise different amounts of power in engaging in these purposes. The means of public participation include groups and formal organizations, meetings, inquiries, action, and technical assistance. When 'public participation' refers to communities, participation poses questions of representation. Some citizens, particularly the better educated and wealthier, generally have greater ability to participate than others. There are examples of public participation that has accomplished its purposes and solved problems, but empirical data are sketchy, and no systematic evaluation of public participation is possible at this time.

Many agencies or individuals choose to exclude or minimize public participation in planning efforts claiming citizen participation is too expensive and time consuming. Yet, many citizen participation programs are initiated in response to public reaction to a proposed project or action. However, there are tangible benefits that can be derived from an effective citizen involvement program.

#### **7.4 WHY IS PUBLIC PARTICIPATION SO IMPORTANT?**

Public participation is a way to empower citizens to be at the heart of environmental democratic governance. Through this tool, there is an opportunity for communities to act and try to influence decisions from which they are affected by shaping the policies and the plans that concern the environment they are living in. Finally, through public participation, the transparency of the decision-making increases, the different needs of each community are being better communicated, different perspectives are being heard which leads to a more holistic and complete approach to handling environmental issues which are often complex, and finally, problems are flagged in early stages which leads to better compliance with obligations and higher acceptance by the community.

#### **7.5 THE LADDER OF CITIZEN PARTICIPATION**

The ladder of citizen participation (shown below) has eight steps, each representing a different level of participation. From bottom to top, the steps explain the extent of citizen participation and how much real power citizens have to determine the process and outcomes. The ladder is a useful tool for interpreting what is meant when programmes and policies refer to 'participation'. Aronstein uses the terms 'the powerful' and 'citizens' as shorthand, but emphasises that neither are homogenous entities; and that each grouping contains actors with more or less power.

At the lowest end of the ladder, forms of non-participation are used by powerful actors to impose their agendas. Participation as tokenism occurs when participants hear about interventions and may say something about them, which power holders denote as 'input'. However, the voices of participants will not have any effect on the intervention; thus, participation does not lead to change. At the higher end of the ladder, participation is about citizens having more power to negotiate and change the status quo. Their voices are heard and responded to. (Source: Aronstein, S. (1969) 'A ladder of citizen participation', *Journal of the American Institute of Planners* 35.4: 216–224)

#### **7.6 THE FORMS AND FUNCTIONS OF PARTICIPATION**

Sarah White distinguishes four forms of participation: nominal, instrumental, representative and transformative. She reasons that each form has different functions, and

argues actors 'at the top' (more powerful) and 'at the grass roots' (less powerful) have different perceptions of and interests in each form.

- Nominal participation is often used by more powerful actors to give legitimacy to development plans. Less powerful people become involved in it through a desire for inclusion. But it is little more than a display, and does not result in change.
- Instrumental participation sees community participation being used as a means towards a stated end – often the efficient use of the skills and knowledge of community members in project implementation.
- Representative participation involves giving community members a voice in the decision-making and implementation process of projects or policies that affect them. For the more powerful, representative participation increases the chances of their intervention being sustainable; for the less powerful, it may offer a chance for leverage.
- Transformative participation results in the empowerment of those involved, and as a result alter the structures and institutions that lead to marginalisation and exclusion.

### **7.7 SELECTING THE RIGHT LEVEL OF PUBLIC PARTICIPATION**

Discusses the different forms that public participation might take depending on the potential for public influence on a decision. These forms include:

- informing the public by providing information to help them understand the issues, options, and solutions
- consulting with the public to obtain their feedback on alternatives or decisions
- involving the public to ensure their concerns are considered throughout the decision process, particularly in the development of decision criteria and options
- collaborating with the public to develop decision criteria and alternatives and identify the preferred solution
- empowering the public by placing final decision-making authority in their hands.
- Depending on the form of participation sought, public participation makes use of a variety of tools and techniques to inform the public, generate public input, and, in some cases, build consensus and reach agreement.

### **7.8 BENEFITS OF PUBLIC PARTICIPATION**

Many agencies or individuals choose to exclude or minimize public participation in planning efforts claiming citizen participation is too expensive and time consuming. Yet, many citizen participation programs are initiated in response to public reaction to a proposed project or action. However, there are tangible benefits that can be derived from an effective citizen involvement program. Public participation is not simply a nice or necessary thing to do; it actually results in better outcomes and better governance. When done in a meaningful way, public participation will result in two significant benefits:

- (i) Information and ideas on public issues
- (ii) Public Support for planning decisions
- (iii) Avoidance of protracted conflicts and costly delays
- (iv) Reservoir of good will which can carry over to future decisions; and
- (v) Spirit of cooperation and trust between the agency and the public.
- (vi) Sponsor agencies will make better and more easily implementable decisions

that reflect public interests and values and are better understood by the public.

- (vii) Communities develop long-term capacity to solve and manage challenging social issues, often overcoming longstanding differences and misunderstandings.

## **7.9 RESULT IN BETTER DECISIONS**

Public participation contributes to better decisions because decision-makers have more complete information – in the form of additional facts, values, and perspectives obtained through public input – to bring to bear on the decision process. They can then incorporate the best information and expertise of all stakeholders. Decisions are more implementable and sustainable because the decision considers the needs and interests of all stakeholders including vulnerable/marginalized populations, and stakeholders better understand and are more invested in the outcomes.

As a result, decisions that are informed by public participation processes are seen as more legitimate and are less subject to challenge. Decision-makers who fully understand stakeholder interests also become better communicators, able to explain decisions and decision rationale in terms stakeholders understand and in ways that relate to stakeholders' values and concerns.

## **7.10 DEVELOP COMMUNITY CAPACITY**

Another major result of sustained stakeholder participation in decisions and their implementation is the development of capacity for managing difficult social problems. This capacity includes improved relationships and trust between decision-makers and the public, and among different stakeholders themselves. Also, when done well, public participation helps to teach stakeholders meaningful and collaborative ways to approach each other, manage difficult decisions, and resolve disputes. Stakeholders learn to appreciate each other's positions by first learning about each other's values and interests.

Once stakeholders are invited into the decision process, it becomes more difficult for them to merely stand to the side and say "no." As participants in good decision-making processes, all stakeholders must understand all sides of an issue, weigh the pros and cons, and make more thoughtful decisions. Stakeholders and communities do not generally achieve this on their own. Sponsoring agencies must recognize their responsibility to help communities build their capacity for collaborative problem solving.

This community model facilitates collaboration to address environmental and/or public health issues in distressed communities.

## **7.11 Considerations for Successful Public Participation**

In order to establish and maintain effective public participation, sponsoring agencies and decision makers should consider how they are supporting the process. Some important elements to successful public participation can include the following:

- Sufficient resources to conduct the process – provide the funding and staff to support all aspects of the process, including a situation assessment, outreach activities, and obtaining and incorporating public input, with resources dedicated to involving vulnerable populations and overburdened parts of the community
- Participative capacity among staff and participants – conduct training in communication, outreach, and collaborative problem-solving skills

- A climate of integrity – trust and credibility of government are essential for public participation. Public participation will not flourish where government agencies or decision makers are corrupt or disingenuous about considering public input
- A belief in the value of public input – the knowledge that public input will result in better decision-making and that public participation results in better governance
- Capacity to engage - ensuring that agencies know how to design and implement public participation processes, and that agencies and the public alike have the knowledge and communication skills to participate effectively in the process
- Complete transparency – the timely sharing of easily understandable and accessible information to educate the public about the issues and options.

Although the conditions and responsibilities for public participation are significant, you should not feel daunted. Rather, public participation should be viewed as an opportunity to make a powerful decision – one that resolves issues to the broadest possible satisfaction and benefit of interested parties. When done well, the time and effort invested in public participation pay dividends by resulting in a more broadly acceptable, implementable, and sustainable decision.

Some legal and other frameworks have developed a human rights approach to public participation. For example, the right to public participation in economic and human development was enshrined in the 1990 African Charter for Popular Participation in Development and Transformation. Similarly, major environmental and sustainability mechanisms have enshrined a right to public participation, such as the Rio Declaration.

## 7.12 AREAS OF PUBLIC PARTICIPATORY

### **i. Budgeting**

Participatory budgeting is a process of democratic deliberation and decision-making, in which ordinary city residents decide how to allocate part of a municipal or public budget. Participatory budgeting is usually characterized by several basic design features: identification of spending priorities by community members, election of budget delegates to represent different communities, facilitation and technical assistance by public employees, local and higher-level assemblies to deliberate and vote on spending priorities, and the implementation of local direct-impact community projects. Participatory budgeting may be used by towns and cities around the world, and has been widely publicised in Porto Alegre Brazil, where the first full participatory budgeting process was developed starting in 1989.

### **ii. Development**

In economic development theory, there is a school of participatory development. The desire to increase public participation in humanitarian aid and development has led to the establishment of a numerous context-specific, formal methodologies, matrices, pedagogies and ad hoc approaches. These include conscientization and praxis; Participatory action research (PAR), Rapid Rural Appraisal (RRA), and participatory rural appraisal (PRA); Appreciation Influence Control Analysis (AIC); "open space" approaches; Objectives Oriented Project Planning (ZOPP); vulnerability analysis and capacity analysis.

### **iii. Environment and Sustainable Development**

In recent years public participation has become to be seen as a vital part of addressing environmental problems and bringing about sustainable development. In this context the limits of solely relying on technocratic bureaucratic monopoly of decision making, and it is argued that public participation allows governments to adopt policies and enact laws that are relevant to communities and consider their needs.

**iv. Heritage**

Around the globe experts work closely with local communities. Local communities are crucial stakeholders for heritage. Consultation with local communities is acknowledged formally in cultural management processes. They are necessary for defining the significance of a cultural place/site, otherwise you run the risk to oversee many values, focusing on “experts” views. This has been the case in heritage management until the end of the 20th century. A paradigm shift started with the Burra Charter by ICOMOS Australia in 1979 and was later developed by the work of the GCI around 2000. Today, so called “value-led conservation” is at the base of heritage management for WH sites: establishing stakeholders and associated values is a fundamental step in creating a Management Plan for such sites

**v. Public Policy**

In some countries public participation has become a central principle of public policy making within democratic bodies, policies are rendered legitimate when citizens have the opportunity to influence the politicians and parties involved. In the UK and Canada, it has been observed that all levels of government have started to build citizen and stakeholder engagement into their policy-making processes. Situating citizens as active actors in policy-making can work to offset government failures by allowing for reform that will better emulate the needs of citizens. By incorporating citizens, policies will reflect everyday needs and realities, and not the machinations of politicians and political parties. Public participation is viewed as a tool, intended to inform planning, organising or funding of activities. Public participation may also be used to measure attainable objectives, evaluate impact, and identify lessons for future practice.

**vi. Public Trust**

In recent years loss of public trust in authorities and politicians has become a widespread concern in many democratic societies. The relationship between citizens and local governments has weakened over the past two decades due to shortcomings in public service delivery. Public participation is regarded as one potential solution to the crisis in public trust and governance, particularly in the UK, Europe, and other democracies. Establishing direct citizen participation can increase governance's effectiveness, legitimacy, and social justice. The idea is that public should be involved more fully in the policy process in that authorities seek public views and participation, instead of treating the public as simply passive recipients of policy decisions.

**vii. Accountability and Transparency**

Public participation may also be viewed as accountability enhancing. The argument being that public participation can be a means for the participating communities to hold public authorities accountable for implementation. In the United Kingdom citizens are used to ensure the fair and humane detention of prisoners. Volunteers comprise the Independent Monitoring Board that reports on the fair and humane detention of prisoners and detainees.

**viii. Critical Interpretations**

The concept and practice of public participation has been critiqued, often using Foucauldian analytical frameworks. Such accounts detail how participation can be a method of capturing community activity into regimes of power and control although it has also been noted that capture and empowerment can co-exist.

In 1990 practitioners established the International Association for Public Practitioners in order to respond to the increasing interest in the practice, and in turn established the International Association for Public Participation (IAP2). The practice is well established globally and the International Association of Public Participation now has affiliate organizations across the globe.

## 7.13 PUBLIC PARTICIPATION IN ENVIRONMENTAL GOVERNANCE

With growing complexities of the environmental issues, public participation has come to the fore in academic analysis concerning the contemporary debates about environmental governance.

There have emerged a number of arguments in favour of a more participatory approach, which stress that public participation is a crucial element in environmental governance that contributes to better decision making. It is recognised that environmental problems cannot be solved by government alone. Participation in environmental decision-making effectively links the public to environmental governance. By involving the public, who are at the root of both causes and solutions of environmental problems, in environmental discussions, transparency and accountability are more likely to be achieved, thus secures the democratic legitimacy of decision-making that good environmental governance depends on. Arguably, a strong public participation in environmental governance could increase the commitment among stockholders, which strengthens the compliance and enforcement of environmental laws.

### 1. Right to Public Participation

The right to public participation is a human right enshrined by some international and national legal systems that protects public participation in certain decision-making processes. Article 21 of the Universal Declaration of Human Rights states the right of every person to participate in the affairs of his country, either directly or by selecting representatives. Likewise, the right to political participation means the right under which the ruling authority is committed to providing rights to citizens, including the right to nominate and elect representatives, to hold public office in accordance with the principle of equal opportunities, to participate in private and public meetings, and the right to form and join political parties. Articles 20 and 27 of the international covenants on Civil and Political Rights make a similar declaration about the right to participate in the management of public affairs.

### 2. Public Participation in Environmental Decision-making

Even though successfully engaging people in environmental decision-making is challenging, inclusive and meaningful participation is a core content in achieving sustainable and environmental goals.

#### i. Formal participation

A rapid rise in formal approaches of participation has been seen for years. Those formal and conventional participation approaches, including public meetings, citizen assemblies and other consulting processes, are often led by public authorities to promote public participation beyond voting.

The government sectors usually invite people to share concerns and opinions and engage in environmental decision-making through the “participatory democracy” approach. This engaging approach reshapes the administrative process into collaborative decision-making. In some contexts, public participation is obligatory in environmental decision-making. For example, engaging the public and relevant stakeholders and collecting their opinions in environmental impact assessment, urban land use planning, etc., are mandatory.

The more advanced approach of formal participation includes the process of information exchange and deliberative communication, known as “deliberative democracy”. That is, authorities or social organizations take a group of citizens or stakeholders together to

deliberate on environmental issues and make rational decisions. Moving beyond two-way communication, the deliberative process allows sharing and co-creation which lay the foundation for mutual understanding and facilitate problem-solving. Critiques for deliberation include that the participants must be open-minded to ensure the success and marginalized groups are still disadvantaged which deepen the inequalities.

## **ii. Informal participation**

The informal way of participation could be also useful and compensate for some deficits of formal participation. Unlike formal participation which favour the privileged groups, participation outside of the institutionalized authorities expands the opportunities for citizens to engage in decision-making. The common approaches, community forums, workshops and events, can provide feedback and input to decision-makers. Although in general, the participants will not directly affect final decisions, these approaches bring citizens with larger-scale of awareness, better-informed knowledge, clearer attitudes and confidence prior to the formal participation. Bringing citizens to discussions also empowers citizens in decision-making.

However, formal and informal participation are often tied together. This requires the collaboration of public authorities and civil society. Civil society can create space for public participation by leveraging their influential networks mostly through informal approaches of participation. Researches show that the participants' preferences, two-way or dialogue-based communication and multilevel governance have a significant impact on environmental outputs. The creation of liveable and sustainable environment requires the successful engagement of all sectors at all levels of society. Public participation is, thus, the key tool to foster collaboration with stakeholders and citizens and generate meaningful environmental outcomes.

## **7.14 HOW IS THIS RELATED TO ENVIRONMENTAL LAW?**

“Environmental issues are best handled with the participation of all concerned citizens at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided.” Principle 10, Rio Declaration (1992).

Principle 10 of the Rio Declaration introduced the three main pillars of environmental democracy: the right to access environmental information, the right to participate in the decision-making process on environmental matters, and a right to judicial recourse. Then, these pillars were enshrined in specific articles of the Aarhus Convention, notably in Articles 4–5 (access to information), 6–8 (decision-making), and 9 (access to justice).

## **7.15 SUMMARY**

Public participation is open to natural or legal persons, as well as associations. It concerns the preparation, modification, or review of plans or programs relating to the environment. Public participation has been characterized as an instrument of prevention, as it contributes to the democratic control of decision-making in environmental matters. It contributes to the advancement of the democratic legitimacy of environmental decisions and



therefore facilitates proper implementation and enforcement. Public participation has been recognized as a fundamental international environmental law principle, as enshrined in principle 10 of the Rio Declaration (1992) and reaffirmed as well as fleshed out through the adoption of the Aarhus Convention (1998), which has strongly influenced issues of participation in environmental matters.

### 7.16 TECHNICAL TERMS

**Public participation:** It refers to citizen involvement in public decision making.

**Stakeholders:** Those that have an interest or stake in an issue, such as individuals, interest groups, communities.

**The Aarhus Convention:** It is an international agreement that gives people the right to access information about the environment.

### 7.17 SELF-ASSESSMENT QUESTIONS

1. Why is Public Participation so Important?
2. Explain the benefits of public participation?

### 7.18 FURTHER READING

1. Fung, A. (2006). Varieties of participation in complex governance. *Public Administration Review*, 66(Supp.), 66-75.
2. Bozhinova, K. (2014) *Environmental Governance and Public Participation*.
3. Berry, L.H, Koski, J., Verkuijl, C., Strambo, C. and Piggot, G. (2019). Making space: how public participation shapes environmental decision-making. Discussion brief. Stockholm Environment Institute.
4. Born, K. (2018, June 21). Social Media: Driving or Diminishing Civic Engagement? |
5. Dahlgren, P. (2013): *Democracy, Participation, and Media Connections*. The Political Web. Palgrave Macmillan UK. 9-35
6. Swart, J.; Peters, C.; Broersma, M. (2017): *New Rituals for Public Connection: Audiences' Everyday Experiences of Digital Journalism, Civic Engagement, and Social Life*. *Managing Democracy in the Digital Age*. Springer International Publishing. 181-199
7. Anne N. Glucker, Peter P.J. Driessen, Arend Kolhoff, Hens A.C. Runhaar, Public participation in environmental impact assessment: why, who and how? *Environmental Impact Assessment Review*, Volume 43,2013, Pages 104-111

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# LESSON 8

## TRADITIONAL AND ALTERNATIVE FORMS OF PUBLIC PARTICIPATION

### OBJECTIVES

1. Define Purpose and Objectives of Public Participation
2. Enumerate Traditional Participation Techniques
3. Name the Principal Challenges of Public Participation
4. Understand the Alternative Forms of Participation

### Structure

- 8.1 Introduction
- 8.2 Purpose and Objectives of Public Participation
- 8.3 Who involved in the Public Participation?
- 8.4 Traditional Participation Techniques
- 8.5 Criticisms of Traditional Forms of Public Participation
- 8.6 Principal Challenges of Public Participation
- 8.7 Alternative Forms of Participation
- 8.8 Barriers to Community Engagement
- 8.9 Summary
- 8.10 Technical Terms
- 8.11 Self-Assessment questions
- 8.12 Suggested Readings

### 8.1 INTRODUCTION

Traditional mode of public participation is the mode of using local traditional leaders to promote politics. It is a mode which allows room for physical participation, like the face to face mode of participation. Traditional public participation uses to be that people go to gather in a particular place, take decisions usually it is the males that go to such meetings, even if it was a women or children related matters. These days, that position is rarely obtainable as every adult has the right to participate in the election of leaders who will represent him/her.

### 8.2 PURPOSE AND OBJECTIVES OF PUBLIC PARTICIPATION

- informing stakeholders
- gaining their views, concerns and values
- taking account of public inputs in decision making
- influencing project design
- obtaining local knowledge
- increasing public confidence
- improving transparency and accountability in decision-making
- reducing conflict

### 8.3 WHO INVOLVED IN THE PUBLIC PARTICIPATION

- ❖ The range of stakeholders involved in a participation typically includes

- ❖ The people – individuals, groups and communities – who are all acted by the proposal;
- ❖ the proponent and other project beneficiaries;
- ❖ government agencies;
- ❖ NGOs and interest groups; and
- ❖ Others, such as donors, the private sector, academics etc.

### **i. Local People**

Individuals or groups in the allocated community will want to know what is proposed; what the likely impacts are; and how their concerns will be understood and considered. They will want assurances that their views will be carefully listened to and considered on their merits. They will want proponents to address their concerns. They will also have knowledge of the local environment and community that can be tapped and incorporated into baseline data.

### **ii. Proponents**

Understandably, proponents will wish to shape the proposal to give it the best chance of success. Often, this involves trying to create public understanding and acceptance of the proposal through the provision of basic information. More creatively, project design can be improved through using public inputs on alternatives and mitigation and understanding local knowledge and values.

### **iii. Government Agencies**

The government agencies involved in the public participation process will want to have their policy and regulatory responsibilities addressed in impact analysis and mitigation consideration. For the competent authority, an elective public involvement programme can mean the proposal may be less likely to become controversial in the later stages of the process. For the responsible public participation agency, the concern will be whether or not the public involvement process conforms to requirements and procedures.

### **iv. NGOs/ Interest Groups**

Comments from NGOs can provide a useful policy perspective on a proposal; for example, the relationship of the proposal to sustainability objectives and strategy. Their views may also be helpful when there are difficulties with involving local people. However, this surrogate approach should be considered as exceptional; it cannot substitute for or replace views which should be solicited directly.

### **v. Other Interested Groups**

Other interested groups include those who are experts in particular fields and can make a significant contribution to the public participation study. The advice and knowledge of government agencies and the industry sector most directly concerned with the proposal should always be sought. However, in many cases, substantive information about the environmental setting and effects will come from outside sources

## **Factors that may Constrain Public Participation**

Some of the underlying factors that may constrain meaningful public involvement include:

- **Poverty** – involvement means time spent away from income-producing tasks, and favours the wealthy.
- **Remote and rural settings** – increased or dispersed settlement distances make communication more difficult and expensive.
- **Illiteracy** – involvement will not occur if print media is used.

- **Local values/culture** – behavioural norms or cultural traditions can act as a barrier to public involvement or exclude those who do not want to disagree publicly with dominant groups.
- **Languages** – in some countries a number of different languages or dialects may be spoken, making communication difficult.
- **Legal systems** – may be in conflict with traditional systems and cause confusion about rights and responsibilities over resource use and access.
- **Interest groups** – bring conflicting and divergent views and vested interests.
- **Confidentiality** – may be important for the proponent, and may weigh against early involvement and consideration of alternatives.

### **Public Participation platforms**

There are other options that ensure that discussions are fruitful and valuable for the community. Public participation platforms have been booming during recent years – they offer an engagement tool that solely focuses on bringing organizations or municipalities and their members, citizens respectively, together. They have many opportunities for engagement, might it be with surveys, questionnaires, polls, reporting of issues via maps, or even the possibility of participatory budgets.

To keep the community informed, organizations can share stories, discussions or challenges, which the community is able to interact with by commenting, asking questions or giving suggestions.

## **8.4 TRADITIONAL PARTICIPATION TECHNIQUES**

Several techniques for participation are nearly ubiquitous in the world countries, most of which are enshrined in law as required “steps” in a public decision process. These may include in different processes public hearings, written public comments on proposed projects, and the use of a citizen-based commission with quasi-judicial and/or quasi legislative power. The first two tend to be rather formalistic one-way communication from the public to the agency or elected officials. There is little or no opportunity in these methods for interchange or learning from one another. Typically, only where a large and vocal contingent pack a public hearing or some member of an informed interest group finds a major flaw in a project are there any changes in the plans as a result of such commentary. Needless to say, these events are most often alienating to participants and privately seen as a waste of time, if not actually a great nuisance, by professionals and elected officials. But such hearings have an almost religious significance to many as expressions of the public will, and they are not optional.

### **i. The Citizen Commission**

The citizen commission is another traditional model for public involvement, but it is rather different. In this model, leading citizens in a city or state are appointed to a planning or transportation commission sometimes selected to represent different interests, such as development or environment, but often simply to represent the views and supporters of the elected officials who appoint them. This kind of group often has the authority to make decisions that can be overridden by the elected body, but which are usually allowed to stand. This approach has a considerable advantage over the first two methods of participation in that interchange is possible; the group members can become fairly knowledgeable about a topic and thus can make informed decisions. However, the group is not necessarily representative of the people or interests in the community, much less of those outside it.

## **ii. Public Involvement Program**

A number of techniques of education and outreach are increasingly employed by traditional public agencies as part of their public involvement program. These include, for example, at the New Delhi's Metropolitan Transportation Commission (MTC), newsletters and big meetings with lots of presentations on what the agency has been doing about transportation problems. They also take the form of staff members going on TV and radio programs to talk about the agency or even of systematic public information campaigns, led by professional consultants. It may involve answering questions from the public. These can be useful and important exercises, in at least some incarnations, to make sure the public is aware of the work of the agency, but they cannot be called public participation. These methods do not raise issues as a rule. They tend to be one-way processes from the agency to the community, designed to say, "We are doing a great job." They tend to be more public relations than public participation. While clearly education is an essential prerequisite to meaningful public participation, often the process stops with the education of the public and does not proceed to the education of the agency.

## **iii. Focus Groups and Opinion Polls**

Another approach that is rapidly growing in popularity is the use of focus groups and opinion polls. These are helpful ways of finding out what the public, or various elements of the public, think at a point in time, but they are not public participation either. They are not interactive between the decision-makers or planners and the public. Citizens serve only as objects of research, but not as active participants in policymaking. Such research is helpful in informing the agency and providing a starting place for working with the public. While both these research methods and the one-way education and public relations approach have their value, they are really pseudo-participation.

### **2.8.4. Criticisms of Traditional Forms of Public Participation**

Traditional methods of participation received some criticism on the basis that their ability to engage with the public and the encouragement of exchange of ideas were limited, which reduced the effectiveness of those tools and the difficulty in evaluating decisions taken.

There are also some critics on Public participation. It can be time-consuming and sometimes expensive. A major internal challenge in public participation is inadequate financial resources and human resources. Involving the public in decision-making is time-consuming and costly in terms of money and energy. To do it effectively, organizations have to build capacity and train staff. If done poorly, public participation processes can result in, for example, loss of faith in the agency. A negative experience of the process may lead participants to have negative perceptions of the outcome, and they may be less likely to participate in future processes.

## **8.6 PRINCIPAL CHALLENGES OF PUBLIC PARTICIPATION**

Implementing the public participation process is vital in a democratic society and fulfil public needs. However, public participation is sometimes constrained by many factors. Exploring the reasons behind the obstruction of the implementation of the public participation process is an important approach to the achievement of effective participation and better results. We analyse the internal and external factors that impede public engagement as follows.

### **i. Costly**

A major internal challenge in public participation is inadequate financial resources and human resources. Involving the public in decision-making is time-consuming and costly in terms of money and energy. Starting from the planning process, it needs a lot of time to

establish a meaning process that can effectively engage people and their thoughts. Administrators already have a heavy workload, so it is challenging for them to spend more time and energy on public engagement. In addition, the arrangement of forums, workshops or public meetings requires adequate funds, long preparation time, and enough staff. Compared with the benefits, the transaction cost may be even higher. Therefore, conducting a participation project at a low cost is challenging.

#### **ii. Lack of skilled facilitator**

Some administrators who organise the public engagement process are not equipped with engagement skills. They may also have less experience in public participation. Skilled practitioners are critical to the success of participation as they can facilitate the process, maintain a good relationship with citizens, and generate better results. Although some agencies offer external service, courses or workshops to train the administrators about public participation, they are often expensive and do not take the context into consideration. In fact, a simplified engagement process that the practitioner can easily practice is more practical and beneficial.

#### **iii. Low efficiency**

Participating in public meetings is usually not a priority for people when competing with work, household or other daily obligations. Less time is available after completing daily chores, which makes the engagement more difficult. Furthermore, traditional public engagement approaches generally take a longer time with less satisfying results, leading to an even lower rate of participation. Thus, increasing the efficiency of the participation approaches without compromising the outcomes is an urgent need.

#### **iv. Not interested in participation**

Another external factor of the low participation level is that the public shows less interest in public matters. How to motivate the citizens, stimulate their interests, and obtain meaningful inputs are the questions that practitioners need to answer. To increase the participation level, we can provide multiple ways and opportunities to them. For example, encouraging the public to participate in public issues related to their daily life or offering rewards for participation are the possible solutions.

#### **v. Language barriers**

In the context where it has a variety of nationalities, culture or language barrier is always a problem. People who do not master the local language are often excluded from public meetings simply due to the language barrier. Especially in an international community, language is the main reason for excluding immigrants and foreigners as one of the marginalised groups.

### **8.7 ALTERNATIVE FORMS OF PARTICIPATION**

In many parts of the world, we can observe that established ways and traditional forms of participation are decreasing among young people. Does that mean that young people are more disengaged, apathetic? Do they lack the information to adequately participate?

Research suggests the contrary: young people are engaged, aware, and highly informed of the issues that affect their lives. What we're seeing is young people engaging in a number of new ways that are emerging in youth participation.

The main driving forces of emerging ways of participation are:

- The widespread use and influence of technology
- Rising nationalism and populism
- Lack of trust in formal political structures

### **1. Emerging ways of Participation**

These are characterized by informality, issue-based goals, horizontal organization, and intermittent and micro-level engagement.

These can be associated with: social/civic and informal settings. Notably, they often blur the line between public and private space, and the nature of these spaces is often claimed or created. Emerging ways of participation can be enhanced by technology, but do not exist exclusively online. Young people favour issues that are connected to the development of their own identities and self-determination. Examples include wearing t-shirts that communicate a political idea or statement, buying fair-trade products, eating vegan as an environmental stance, sharing political views on social media, and volunteering.

### **2. Some characteristics of emerging ways of participation include:**

- Focused on a single issue
- Such as environment, gun control, etc.
- Often non-hierarchical grassroots movements
- Such as School Strike for Climate, etc.
- Use of online tools
- Such as Whats App, Telegram, Twitter, etc.
- Recurrence of street protests
- Such as pro-democracy protests in Hong Kong, global climate strikes or March for our Live, etc.

### **3. Levels of Participation**

Emerging approaches in youth participation are not only happening on the grass root level – there are several examples of institutional approaches to participation emerging across the public and not-for-profit sectors. For example:

- smart participation/e participation;
- deliberative democracy;
- co-management and co-creation

As the world is rapidly changing, so are the ways that young people prefer to participate in decision-making processes and political discourse. One of the measures of the meaningfulness of a youth participation agenda is its adaptability to change. The more diverse opportunities for young people to be a part of discussions and decisions made about them are, the greater the likelihood that more young people will want to be a part of it.

### **4. Interactive and Collaborative Methods**

At the same time as these ritualized and sometimes polarizing methods of participation continue to consume vast public resources, a wide array of collaborative and experimental methods of public participation are taking place. These are often under the auspices of the same agencies that are going through the traditional formalities, but often they also are being done in ad hoc and informal ways outside formal public decision-making processes. Some of these have been done in various forms for many years, but they are evolving and gaining in popularity as the techniques are being refined and developed. Informal or ad hoc task forces representing the major interests may be established to make recommendations on controversial issues. For example, a task force made up of pro-development and anti-development individuals, along with a variety of business members and nearby residents might be convened to find a consensus on the problems and desired future of a town's business district.

Many communities have also developed community or neighbourhood boards, sometimes with a broad mission to address all neighbourhood policy issues, or others with more specific missions. These involve local people who become well informed on the topics

and develop working relationships with agency staff. They help develop programs and provide information and legitimacy to the rest of the community because they are known to play an active role in the decisions. Foundations and non-profit organizations have also been the instigators for such neighbourhood organizations, which may have varying degrees of formal or informal organization as elected bodies or more self-selected groups.<sup>9</sup> These groups can be powerful players representing much of the community to other agencies.

### **5. Internet Technology**

Internet technology also offers the potential to allow many citizens to express their opinions on policy ideas or planning issues. While this e-government approach remains in its infancy,<sup>8</sup> experiments abound and simple applications are easy to develop. Proposals can be posted on an agency's website and comments received and even responded to on the website for all to see and review. Town hall-type conversations are possible with elected officials on a real-time basis. Much of this in the first instance is an extension of the stepwise process of presenting ideas to the public and the public responding in turn. But these can be developed into versions of the more interactive participatory methods described below as the give and take among government officials and citizens increases and becomes less ritualized and more informal. Nonetheless, the Internet model inevitably lacks the authenticity of dialogue that can come through in-person discussions.

Traditional methods have been unsatisfactory to many interested citizens and organizations. These have led to protests, citizen-initiated ballot measures and, in many cases, full-fledged social movements formed to challenge the powers that be.

### **6. The Future of Digital Participation**

Although there are some gaps in current digital participation practices, they come with a lot of advantages that we should not ignore. The remarks on the flaws of engagement platforms are not meant to diminish the relevance of and interest in tools that provide easy access towards participation.

It rather highlights the complexity of public participation itself; especially the power to change current exclusionary and discriminatory structures cannot be underestimated. If people are willing to be part of discussions and practices that are aimed at improving the livelihood and not just of themselves, but also of individuals who are often overlooked, digital participation platforms can support a growing understanding and awareness of differing social realities.

### **7. Effects of social media**

In recent years, social media has led to changes in the conduct of participatory democracy. Citizens with differing points of view are able to join conversations, mainly through the use of hash tags. To promote public interest and involvement, local governments have started using social media to make decisions based on public feedback. Users have also organized online committees to highlight local needs and appoint budget delegates who work with the citizens and city agencies.

#### **2.8.7. Barriers to Community Engagement**

Inclusive engagement gives everyone in the community an opportunity to be involved in the decisions that affect their lives. However, no matter how hungry we are to be more inclusive unless we actively seek to understand and expose public participation barriers, it can be very difficult to account for them in the design of our engagement strategies. Even when a diverse and representative cross-section of the public is engaged, people's voices may not influence outcomes equally, as differences in power and privilege play out in the way that final decisions are made.

At times, the logistics of an engagement, like location and timing can conflict with other responsibilities, such as work or childcare. Many groups of people also face historic and



on-going marginalization due to their identity and lived experiences, such as race, ethnicity, religion, gender, sexual orientation, disability, socioeconomic background, and citizenship status. These groups can be under-represented in decision-making or engagement processes due to overt exclusion and/or inadvertently due to a lack of awareness of systemic physical, social, and financial barriers.

#### **i. Lack of Time**

Not all community groups have sufficient time, capacity, and resources to attend and respond to all engagement requests. It's important to think about the timing of your engagement and compensation for those who need it. Parents and caregivers (many of whom are women) can find it difficult to participate in face-to-face engagement events. People who are employed can also find it difficult to attend during work hours.

#### **ii. Disability or Impairment**

Disabled people can face accessibility barriers depending on the way that engagement is facilitated, and the location, facilities, supports, and technology should help them participate in a way that suits them best. For example, the use of interpreters, appropriate language, and subtitles need to be considered for physically and neuro-diverse people.

#### **iii. Distrust**

People who have had negative experiences with governments or have had contact with the justice system may not be willing to share their thoughts and opinions with you. That's why on-going transparency and inclusion are so important. Make sure to consider whether or not people have positively experienced democratic processes before. You also need to honour Indigenous knowledge and world views, while acknowledging and equitably addressing the impact of past and present-day colonialism.

#### **iv. Digital Capability**

People who spend less time online and have lower digital capability may not be able to participate in online community engagement and communications efforts effectively.

#### **v. Privacy Concerns**

Asking for a lot of personal data could make residents fear that they could be a victim of discrimination or experience a threat to their livelihood, so it's important to be transparent about why you want particular information and explain how it will be used.

#### **vi. Language**

It's important to understand the various languages that are spoken within a community and offer multilingual services so that people can interpret and engage with materials in their preferred language. Matching the right language level for the audience is equally important. Imagine if you were trying to engage children or young people. Keep language welcoming, simple, and jargon-free.

#### **vii. Internet Access**

With more basic services moving online and the pandemic highlighting affordability challenges in wealthier nations, these deep digital gaps are intensifying inequality. People in rural communities can also have limited access to digital infrastructure and the internet.

#### **viii. Financial Strain**

There are groups in the community that may experience financial strain as a result of participating in a community engagement initiative. It may not be feasible for them to take time away from work to attend a face-to-face meeting, or the costs of travel could be too high. It may be necessary to consider compensation for low-income groups and ensure that people's time and expertise are valued appropriately.

**ix. Educational Level**

People have had varying levels of access to education throughout their lives and it's important to provide the right amount of context and information to ensure that everyone has an equal understanding of the engagement process.

**x. Location**

People who live further away from the physical location of face-to-face consultations may find it difficult to attend. It's also important to consider if your community members live in an area or travel through it regularly. Are they homeowners, or renters, or are they experiencing homelessness?

**8.9 SUMMARY**

We have sought here to outline the obstacles to change, to delineate the characteristics and practices of collaborative planning and to develop theory to help understand and advance this mode of citizen participation. We are ultimately making the case that such participatory methods can help to build deliberative democracy and civil society and, in doing so, help us to achieve all the objectives that have been laid out for citizen participation. The ultimate purpose of citizen involvement is to integrate well developed citizen opinion into collective actions and decisions, but to do so in a way that maintains autonomy for the public sphere. No public involvement program will be effective unless the proponent is serious in engaging with the community in a two-way dialogue and is open-minded about what it can contribute to the proposal. Key prerequisites are a willingness to listen to the information, values, and concerns of the community, to amend the proposal so as to minimize community concerns, and to acknowledge the value of community input.

**8.10 TECHNICAL TERMS**

**Proponents:** It means someone who is in favour of some thing

**Digital Capability:** The skills and attitudes that individuals and organizations need if they are to thrive in today's world. At an individual level we define those which equip someone to live, learn and work on a digital society.

**8.11 SELF-ASSESSMENT QUESTIONS**

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1. Explain the Purpose and Objectives of Public Participation
2. Elucidate the Traditional Participation Techniques
3. What are the Principal Challenges of Public Participation and explain?
4. Find out the Alternative Forms of Participation.

**8.12. SUGGESTED READING**

1. World Bank (1995) Public Involvement in Environmental Assessment Requirements, Opportunities and Issues. Environmental Assessment Sourcebook Update Number 5. World Bank, Washington D.C.
2. Reitbergen-McCracken J and Narayan D (1998) Participation and Social Assessment: Tools and Techniques. Book and video tape. World Bank, Washington D.C.

3. Fung, A. (2006). Varieties of participation in complex governance. *Public Administration Review*, 66(Supp.), 66-75.
4. Bozhinova, K. (2014) *Environmental Governance and Public Participation*.
5. Berry, L.H, Koski, J., Verkuijl, C., Strambo, C. and Piggot, G. (2019). Making space: how public participation shapes environmental decision-making. Discussion brief. Stockholm Environment Institute.
6. Born, K. (2018, June 21). Social Media: Driving or Diminishing Civic Engagement? |
7. Dahlgren, P. (2013): *Democracy, Participation, and Media Connections*. The Political Web. Palgrave Macmillan UK. 9-35
8. Swart, J.; Peters, C.; Broersma, M. (2017): *New Rituals for Public Connection: Audiences' Everyday Experiences of Digital Journalism, Civic Engagement, and Social Life*. *Managing Democracy in the Digital Age*. Springer International Publishing. 181-199
9. Anne N. Glucker, Peter P.J. Driessen, Arend Kolhoff, Hens A.C. Runhaar, Public participation in environmental impact assessment: why, who and how? *Environmental Impact Assessment Review*, Volume 43,2013, Pages 104-111

**Dr.Ippili Tharakeswara Rao**

# LESSON 9

## MEDIA AND ENVIRONMENT

### Objectives

- To understand the role of media coverage on environmental issues
- To learn about communicating climate change
- To study the role of social media in highlighting the environmental issues
- To get awareness about media and sensitization campaigns

### Structure

- 9.1 Introduction**
- 9.2 Media and Environmental Campaigns**
- 9.3 Environmental Pollution**
- 9.4 Communicating Climate change**
- 9.5 Role of social media in Environmental Campaign**
- 9.6 Summary**
- 9.7 Technical Terms**
- 9.8 Self-Assessment Questions**
- 9.9 Suggested Readings**

### 9.1 INTRODUCTION

Environment is an integral part of Human advancements in a broad spectrum of disciplines that include several aspects of the ecosystem components. Sustainable development along with technological progress is the prominent aspect in the growth of a Nation. According to Zeng et al 2020, Media magnifies people's perception of environmental risk which in turn affects people's pro environmental behaviour. New media is more capable of amplifying people's insights towards environmental issues. Social media platforms help to share essential environmental information towards the solutions for betterment of planet earth.

Digital media plays a crucial role in describing scientific methods and research to the audience in a very useful manner to address the numerous problems in the society and inspires the public domain about the scientific knowledge, thereby exploring the solutions to numerous challenges. Understanding the environmental issues such as deforestation, pollution, water crisis and climate change etc. From an individual to spread through people and involving the institutions, the media transforms many lives to become an environmental steward and participate in creating a greener earth out of love for mother nature and making a positive change in the world. The integration of mainstream media, community media and social media can help in information dissemination that can potentially impact the mind-sets towards demand for action from policy makers.

Media has a significant part influencing the attitudes of the public creating environmental awareness among the people as it can educate people about anthropogenic activities that adversely affect our environment.

## 9.2 MEDIA AND ENVIRONMENTAL CAMPAIGNS

Environment was not a favourite topic for mainstream media to report the events. The issues of the environment are largely about the broken people and marginalized communities. In this context alternative media, independent journalists and media like street plays played a vital role in filling the cultural vacuum. It helped in creating critical debate among the civil society.

### **Major Environmental campaigns in India include the following:**

The Chipko movement of Chamoli district in Uttarakhand took place in the year 1974 as the ecological destabilization in the tribal areas was alarming. This conservation campaign resulted in tree cover protection as people hugged trees as the rate of deforestation increased. Civil engineering projects affected the Alaknanda River at the foothills of Garhwal Himalayan region due to which the landslides created havoc. The local, National and global media generated news under the notion 'Cut me down before you cut down a tree' raising environmental concerns across the globe based on the speeches delivered by the local activists – Chandi Prasad Bhatt and Sunderlal Bahuguna. The movement originated with the initial objective of conserving individual trees, but gradually expanded its scope to encompass the preservation of entire jungles and the broader environment throughout India. Communicating through reaching out to the community members by walk (padyatra), which involves traversing from one household to another and from one village to another, has shown to be a highly effective means of raising awareness and facilitating communication, surpassing the impact of mass media channels.

The Narmada Bachao Andolan had begun in 1985 against the construction of dams under the Narmada dam project across Narmada River that flows through the states of Gujarat, Madhya Pradesh and Maharashtra. Medha Patkar led NBA along with native tribes, environmentalists and human right activists to build pressure on the World Bank in order to take a stand on its accountability. The project followed by relocation of tribal caused several problems as they lost indigenous inherent knowledge and their practices. The media coverage focused on dramatic events of farmers demanding proper rehabilitation who would be affected by the dam construction along with the environmental costs of the dam that would submerge several hectares of forest land. Thus this movement was first of its kind to raise questions for developmental policies from the environmental perspectives. The national press with few exceptions balanced in its reporting of NBA revealed a nexus between itself and the State government of Gujarat. There are a number of video documentaries produced to depict the plight of displacement and environmental hazards proved the power of the documentary medium. A Narmada Diary (1995) by Anand Patwardhan and Simantini Dhuru was able to voice the concerns of the victims of the dam as well as the emerging social movement.

The Appiko movement was an environmental movement started in 1983 to protect the forests of Western Ghats of Uttara Kannada district of Karnataka. Panduranga Hegde led the campaign to safeguard the forests when the contractors of hydro power project tried to fell trees that resulted in several consequences in order to halt industrialization and urbanization and promote afforestation. The idea to 'Save, grow and use forest resources rationally' aimed for the development of people. Media emphasized news pertaining to this fragile ecosystem and created a revived Gandhian way of protest and mobilized for a sustainable development in the society for a balance between man and nature in an intricate manner.

### 9.3 ENVIRONMENTAL POLLUTION

News media is an essential tool for guiding individual actions and aid for public policies and mitigation guidelines to reduce environmental threats on living organisms. Exposure to higher levels of pollution poses detrimental impacts on the health of a person at local and global levels.

Media and social platforms tend to share information about pollution and associated health risks in a cautious way and these are governed and funded by public organizations.

1. Air Pollution is caused by exposure to major air pollutants which include Particulate matter, Ozone and Oxides of Nitrogen, Sulphur and Carbon monoxide etc., that pose deleterious effects on living organisms. The sources include emissions from automobile, industrial, aviation, agriculture sectors along with forest fires and other natural sources. Respiratory ailments and long-term implications on human health system are suffered by the victims at a startling scale especially in the metro cities. Livestock and plants are vulnerable along with major damage to the monuments. Children and elderly are susceptible to face the consequences as a result of air pollutants.

Mitigation measures include the efficient system to contain the pollutants at each sector and monitoring at the source level is the strategy that needs to be adopted.

Industrial disaster that occurred at Bhopal in 1984 at the Union Carbide factory caused devastation in many lives as a result of exposure to Methyl Isocyanide and was considered as one of the worst air pollution episodes in the history of mankind. It is important that the newspaper's report the threat of air pollution to society as it has profound influence on the public on the need for citizen demand for clean air. The half-buried face of an innocent child taken by Raghu Rai played a critical role in bringing the damage done to the innocent people and magnanimity of the Bhopal gas tragedy to the rest of the world.

Strict enforcement of the rules of the Air (Prevention and Control of Pollution) Act, 1981 in order to regulate air pollution as a remedial measure is the need of the hour. The concept of Polluter pays being witnessed across NCR regions during winters is brought to limelight by the press over the past decade with respect to the menace of Punjab stubble burning and the result of increased air pollution levels is a burning issue which cannot be unattended.

The integration of technology and the inputs from Government agencies and social media websites (Indian, Meteorological Department, Central Pollution Control Board, Centre for Science and Environment etc.,) helps in disseminating the information pertaining to the emission levels and the air quality levels at regular intervals for cautioning on public health. According to the Department of Communication Science, University of Amsterdam and University of California, the reporting of air pollution issues would benefit more diverse, expert and impartial sources. The coverage of news misses opportunities to raise environmental health literacy.

The Global Clean Air Catalyst consortium selected 10 journalists for story grants to deepen the coverage of air pollution. Their stories will be published in local media outlets to highlight the impacts on communities and life systems. Source: <https://earthjournalism.net> Pollution is a scenario wherein the resource becomes useless for its designated use. Increased pace of development and rapid industrialization had increased the demand for resources.

2. Water is considered as the elixir of life, as the life system depends on it so the use and protection of this natural resource should be wise and judicious as the availability of freshwater is at a minor proportion. Resource usage and depletion plays a prominent role in terms of its utility. The sources of water pollution include the pollutants released from sewage, industrial effluents, agricultural residues, siltation process and floods etc. The major water pollutants include nitrates, phosphates, mercury, lead, arsenic and organic decaying matter.

These water pollutants result in harmful effects in living organisms resulting in diseases like cholera, typhoid, and dysentery. Mercury and lead pollutants affect the function of the kidney and also result in lung disorders. Aquatic life is vulnerable and is at greater risk. The preventive measures of water pollution for treatment of water have a significant role as the living organisms cannot imagine life without water. Control of water pollution begins at the sewage treatment plant to treat the wastewater. Enforcing agencies such as the Central Pollution Control Board and legislation for management curbs the problem of water pollution to a greater extent.

The enactment of Water (Prevention and Control of Pollution) Act, 1974 provides guidelines to protect the water bodies from contamination and restoration of wholesomeness of water by establishing water boards.

The data from the Delhi Pollution Control Committee the Yamuna river pollution levels alerts the public on the contamination of water and the reporters collect the news and broadcast the status accordingly.

Media coverage on water pollution is not fully explored. Prominent NGO's and Government organizations update data on their websites pertaining to the contamination levels and inform the public about the water quality.

The largest marine oil spill disaster that resulted in the release of petroleum hydrocarbons into the environment due to anthropogenic activities occurred in 2010 in the Gulf of Mexico and had a profound impact on aquatic life along with human lives due to contamination of water.

The journalists surveyed by the foundation for American Communication report the shortage of training needed to cover complex environmental issues as they cannot provide useful information without adequate background information themselves.

The online video formats and stories of unsustainable agricultural practices in Punjab, water pollution in the Sutlej river etc., covered by multimedia journalist Pawanjot Kaur, on The Wire's reports had provided the momentum to discuss the efforts of activists and policy makers on solving the pollution crisis.

3. Soil is the upper most layer of the earth's crust and as the sustenance of life depends on this resource there is no substitute for it. Soil pollution is the accumulation of the substances on the land in dispersed solid or liquid form that is deleterious to living ecosystems (inorganic and organic matter). Soil erosion or pollution occurs due to natural causes - volcanic eruptions, earthquakes, landslides, dust storms, etc., and due to human habitation, construction, agriculture, industrial and transportation activities as they release toxic elements (Oxides of Sulphur and Nitrogen) that pollute the groundwater contamination also affect and

alter the soil quality. Proper soil conservation measures include a better approach for construction of check dams, trenches, integrated pest management practices and sustainable farming options.

The award winning journalist Oliver Franklin Wallis in his new book *Wasteland* reflects the situation of landfills, the meal inside uneaten; a lone photograph of a child, a single discarded glove etc., in Delhi and reveals the reality of 'a mountain not of a stone but of 14 million tons of garbage in the Ghazipur landfill in his recent interview.

Source: <https://www.thehindu.com/books>

#### **9.4 COMMUNICATING CLIMATE CHANGE:**

The global communities resolved to enhance the Environmental quality at the United Nations Conference on Human Environment held at Stockholm Conference in June 1972. The first world conference to adopt a series of principles for the management of the environment. The Bhopal gas leak disaster in 1986 led to the enactment of the Environment (Protection) Act, 1986.

The objectives of the act authorizes the central government to improve and protect environmental quality in order to reduce and control the pollution at the source level and to restrict the industrial operations which impacts the resources in the environment. The salient features of the act include provision of safety standards of various pollutants and ban the use of hazardous materials.

Communication has a significant role in thought provoking response to climate change as awareness on this issue results in motivation towards drawing the actions to be taken from a personal to global level. Visual images of the climate crisis along with scientific information and sharing experiences in various forms using multimedia will emphasize the concerns and tend towards development of achieving sustainable goals.

According to UN Climate Action, Everyone can play a part by raising their voice, sharing solutions and advocating for change. The guidelines provided by the United Department of Global Communications in collaboration with the United Nations Climate Change (UNFCCC), the United Nations Environment Program (UNEP), World Meteorological Organization (WMO), the Climate Action Against Disinformation (CAAD), the Conscious Advertising Network (CAN) and Yale Program on Climate Change Communication include the usage of Authoritative scientific information source (Intergovernmental Panel on Climate change) to get rid of widespread content of misinformation, helps to convey the problem and thereby derive at the point of solution by making the people release through storytelling presentation for empowerment avoiding stereotypes. This transformation helps to mobilize the action to convey the urgency and relevancy of engaging audiences at all ages towards a progressive step in mitigation.

The organizations communicating climate change triggers the path towards contribution of the messages through the incorporation of value based messages with a relationship of the audience at a global scale making it vivid as it involves every community to become a part in finding solutions to the challenging issues for a greener planet.



According to the United Nations, Climate change refers to long term shifts in the temperatures and weather patterns due human activities primarily due to the burning of fossil fuels like coal, oil and gas. Burning of fossil fuels increases greenhouse gas emissions resulting in the sun's heat and raising earth's temperature at the global level.

The main causes include the coal based power plants for electricity generation, usage of fossil fuels in the transportation sector, deforestation etc. The impacts of climate change are terrifying as the living organisms face new challenges for their survival. Increased droughts, storms, heat waves, rising sea levels, melting of Polar Regions, warming oceans destroy ecosystems and the web of life.

The mitigation measures include at both local level and at global scale. Afforestation, shift to alternate technologies - energy efficient systems as they reduce CO<sub>2</sub> levels, adopting eco-friendly strategies in energy sector, automobile sector, following three R's (Reduce, Reuse and Recycle) and increasing environmental sensitization programs or awareness programs is the need of the hour on which media has an important role to emphasize the urgent need to address this burning issue at global and local level in order to educate and enlighten the public to protect and preserve natural resources for sustainable development.

Media coverage on climate change concepts increased the need for environmental protection. The usage of digital media enhances the capacity to broadcast news focusing on climate change and environment for the public. The watchdog function of the media generates solutions for greener earth. Shanth Kumar is an award-winning photojournalist and documentary photographer who is known for a diverse range of photojournalistic work including coverage of the impact of climate change and pollution on natural life and the environment. In 2018, he was conferred with the Asian journalism award.

## **9.5 ROLE OF SOCIAL MEDIA IN ENVIRONMENTAL CAMPAIGN**

Media brings to limelight various environmental concerns and helps in a multidimensional approach of the emerging technologies in discovering the answers to the existing obstacles helping towards the betterment of the green planet.

The Protection for Environment can be achieved collectively through various modes and one such important form includes the digital media or the social media as it attracts audiences of all ages. Reaching a wider audience through environmental sensitization campaigns result in global movements as the thought provoking ideas lead to conservation and protection towards greener Earth. Online campaigns such as #BeatPlasticPollution, which was a celebrity-led film,(Arnold Schwarzenegger, Moby and Rachel Dratch) had a great impact as it gave a chance to evolve the solutions towards the menace of plastic pollution.

The UN had set apart a theme for World Environment day on June 5th every year for raising environment consciousness among nations working towards Sustainable development. The response of the social media campaigns focus on a particular theme towards the betterment of the environment in various aspects across the globe. One such campaign include the #everydaychangemakers wherein one can share their personal story from saying no to use of plastic straws to using Keep Cup which means I avoid disposable cups etc.,

The use of Twitter, Facebook, YouTube, Instagram and other social media platforms help in communication for global sustainability and the interaction of the viewer's depends on the content and the usage of the eye-catching slogans and the images related to the theme in order to spread the awareness on the burning issues. For instance, Heal the Bay, Shorty Social Good Awards feature several social media campaigns that promote, protect and preserve our environment and these had nearly 3 million viewers. (<https://socialsci.libretexts.org>)

## 9.6 SUMMARY

This lesson discusses the role of media, particularly new media and social platforms, in environmental communication. It emphasizes how media influences people's perception of environmental risks and pro-environmental behaviours. It highlights key environmental campaigns in India, such as the Chipko movement, Narmada Bachao Andolan, and the Appiko movement, and how alternative media played a vital role in raising awareness about environmental issues.

The lesson also addresses environmental pollution, focusing on air, water, and soil pollution. It discusses the health impacts of pollution and the role of media in sharing information about pollution and health risks. The enactment of environmental protection acts is mentioned as a measure to regulate pollution.

Climate change communication is a central theme, underscoring the importance of media in spreading awareness about the causes and consequences of climate change. It emphasizes the role of media in highlighting the impacts of climate change, such as droughts, storms, and rising temperatures, and the need for mitigation measures. The passage mentions Shanth Kumar, an award-winning photojournalist known for his climate change and pollution-related work.

The section on the role of social media in environmental campaigns stresses the importance of digital media in reaching a wider audience. It highlights online campaigns, including #BeatPlasticPollution, and discusses how social media platforms like Twitter, Facebook, and Instagram are used to promote environmental consciousness and sustainability.

Overall, the lesson underscores the significant role of media in environmental awareness, campaigns, and communication, emphasizing its power to inspire action and positive change.

## 9.7 TECHNICAL TERMS

### ●Environment

Environment can be defined as sum total of all the living and non - living elements and their effects that influence human life. The living biotic elements include the plants, animals, birds and the non-living or abiotic elements include the sun, water, land and air.

### ●Mitigation

The act of alleviating the harmful or dangerous conditions by reducing risk of loss from the occurrence of any undesirable event.

### ●Pollution

The act of making an environment unsuitable or unsafe due to anthropogenic activities and thereby makes it unfit for its designated use. The pollutants get accumulated resulting in the degradation of an ecological system.

**●Sensitization Campaigns**

The knowledge and understanding of a problem through information dissemination in various modes such as protests, holding placards or speech in order to achieve a solution.

**9.8 SELF-ASSESSMENT QUESTIONS:**

1. Explain how the media plays a prominent role in Environment protection.
2. Write about any two environmental campaigns in the Indian scenario.
3. Which incident led to the enactment of the Environment (Protection) act, 1986?
4. Name the first African woman environmentalist and human right activist who won the Nobel Prize in the year 2004.

**9.9 SUGGESTED READINGS**

1. Hazarika,S.(1994).From Bhopal to Superfund: The News Media and the Environment. Shorenstein Center Discussion Paper Series.
2. Journalists' Views of the Environment: Issues and Challenges
3. <https://scholars.unh.edu/cgi/viewcontent.cgi?article=1474&context=risk>
4. <https://earthjournalism.net>

**Dr. Shankar Krishna Kusuma**

# LESSON 10

## ENVIRONMENTAL JOURNALISM: PRACTICES AND ISSUES

### Objectives

- To understand the media initiatives in the coverage of environmental issues
- To learn about the best practices of environmental reporting
- To analyse the role of media in presenting objective and balanced news
- To get awareness about the impact of media coverage of environmental issues

### Structure

#### 10.1 Introduction

#### 10.2 Role of media in presenting objective and balanced Environmental news

#### 10.3 Best practices for environmental reporting

#### 10.4 Impact of media coverage of environmental issues

#### 10.5 Towards an engaging reporting: The future

#### 10.6 Summary

#### 10.7 Technical Terms

#### 10.8 Self-Assessment Questions

#### 10.9 Suggested Readings

### 10.1 INTRODUCTION

Environmental journalism is a specialized field of journalism that focuses on reporting, investigating, and analysing issues related to the environment and its impact on society. Environmental journalists cover a wide range of topics, including climate change, conservation, pollution, sustainability, natural disasters, wildlife, and environmental policies. Role of media in reportage on environmental issues like climate change and other pressing local and international issues is vital in bringing awareness and motivating the public to participate in social action. Media has responsibility as well as power to bring the attention of national and international government bodies to adopt their policies to safeguard the environment globally. Achieving Sustainable Development Goals (SDGs) by 2030 is possible with coordination and co-working from all the stakeholders in the society, where media has a major role to bridge the information gap. SDG goal number 13 is about Climate action and 14 is about life below water and 15 is about life on land deals directly with the concerns of the environment.

Environmental journalism is not just limited to reporting the event through print or electronic media but also photography and social media advocacy. Photography has a strong impact on the viewers. “The images exist for a reason,” explains National Geographic photographer Joel Sartore. Raghu Rai through his photographs during the Bhopal gas tragedy brought the impact on human life not only to the public in India but also to the world audience. Rathika Ramasamy is a wildlife photographer worth mentioning in the male dominated field. The other important wildlife photographers are Sunjoy Monga, Shekar Dattatri, Sandesh Kadur, Sudhir Shivaram and more young professionals have taken the job not just as a hobby but a serious, critical engagement with nature.

India has a rich history of environment conservation which has travelled with Gandhi to Vinoba, Sundarlal Bahuguna to Medha Patkar, Rajendra Singh to Marimuthu Yoganathan, Anil Agarwal to Sunita Narayan and so on. They made journalists think of reporting on the issue of the environment which includes a range of issues like climate change, water conservation, wildlife conservation, biodiversity, air pollution, saving trees etc. Initially newspapers and magazines (Television emerged later) were very skeptical about raising issues of the environment. Journalists used to cover issues of the environment raised by eminent personalities as political or social activity but gradually it emerged as a separate beat of reporting.

The year was 1973. The Hindu printed a picture of four women embracing a tree in Uttarakhand's Garhwal. The iconic image of protest from the Chipko Andolan literally put the environment on the front pages of Indian media, probably for the first time. And it became a symbol of a fierce debate to follow- environment vs development. Within two years of the Chipko movement, Anil Agrawal, who later founded Centre for Science and Environment and started India's first science and environment fortnightly, Down To Earth, wrote an essay which was printed by London based New Scientist. This and Agarwal's subsequent efforts as a campaign journalist took the Chipko Movement to an international audience.

Print and electronic media have specialized reporting on various sectors as well as dedicated media. For example financial and business, entertainment, science and technology etc. Similarly there are very few media dedicated to the environment. One can rarely find dedicated newspapers, but a dedicated section in newspapers and television. In India print magazine Down to Earth has been contributing to environmental journalism for a long time. Ever since the digital platforms like websites, blogs and mobile applications have been established, affordability of owning and the rise in running dedicated platforms for the environment in India we can witness.

Websites like

[www.mongabay.com](http://www.mongabay.com),

[www.indiaenvironmentportal.org.in](http://www.indiaenvironmentportal.org.in) and

[www.indiaenvironmentportal.org.in](http://www.indiaenvironmentportal.org.in) are a few examples.

Environmental journalism is essential for raising public awareness about environmental challenges, encouraging responsible behavior, influencing policy decisions, and fostering dialogue on pressing environmental issues. It plays a vital role in addressing and mitigating environmental problems and promoting sustainability and conservation efforts worldwide.

## **10.2 ROLE OF MEDIA IN PRESENTING OBJECTIVE AND BALANCED ENVIRONMENTAL NEWS**

Media has a role to promote the green initiatives by the government and non-government organizations as well as develop environmental friendly habits among the civil society. It has a crucial role in initiating critical debates around the state owned and corporatized media conglomerates.

The Deep Water Horizon oil rig caused the disastrous oil spill in the Gulf of Mexico caused the catastrophic impact on birds and sea creatures. The intense media coverage has brought the issue and its ramifications before the world. Reporters and photographers were not allowed to visit the public property for a long time. Access was given only a few spaces to bury the truth by the oil company.

While writing about organizational bias in the media in covering the oil spill case, Lauren Haller (2011) says narrow approach and corporate bending in coverage of the issue limited the penalty on the culprits. A study comparing spill coverage in a mainstream newspaper and an alternative newspaper in Alaska reveals contrasting media portrayals. The mainstream paper focused on financial compensation and wildlife, while the alternative paper connected damage to respect, duties, and trust issues, expressing despair and sadness rather than numbers.(Widener and Gunter, 2007).

Some of the leading environmental journalists in India who have got recognition for their unbiased work are Manka Behl, senior correspondent; Times of India won the best 2023 Covering Climate Now (<https://coveringclimatenow.org/>) award for their reportage in rural Indias' climate change issues. She has been working on the impact of power plants flying ash on rural communities and other important topics. Her work was able to make the state authorities find ways and measures to reduce the impact from the power plant as well as phase out it. Ishan Kukreti from scroll.in won the award for long form writing report for 2023 on Ghost plantation scam in India.

### **10.3 ENVIRONMENTAL JOURNALISM: BEST PRACTICES FOR ENVIRONMENTAL REPORTING**

Journalism and media training with specific focus on the environment will not only train the budding journalists but also harness their skills and sensitize them to voice the concerns of nature.

The use of right words and language which has a scientific rigor adds to the authenticity of the media content. The Third Pole is one of the organizations which has been working on the issues of climate change, water and nature in Asia has brought a glossary of terms that helps journalists to report on climate change (Kumari, S., 2023). The terms like climate refugees, Desertification, carbon credits, adaptation to climate change, climate refugees, carbon sinks are some of the terms that come in handy to the journalists as well as everyday users to get acquainted with the concepts of environment and climate change.

The organizations like Centre for Science and Environment (CSE) in India have been alerting the public and government through research and publications. Down to Earth is one of the strongest voices in the print media on environmental journalism. Sunita Narain, Director, CSE in her report on the occasion of 76 years of India's Independence said "The most important gain of India's environmental movement is the voice it has given to its citizens. This is the soul of the movement"(2023). She further discussed the lessons learnt and impact from various environmental movements. One of them is the Chipko movement that helped in enacting the Forest conservation act in India. The Narmada dam issue has been one of the countryside movements against development vs displacement and other movements.

The voluntary news organization [www.coveringclimatenow.org/](http://www.coveringclimatenow.org/) devised certain professional practices for reporting climate change. These include

Knowing audiences is one of the first criterions:

Knowing the audience's cultures, information and impact related to the story must be taken care of.

Accurate information and date:

The source and extensive research is required to bring the accurate facts to bring the story in the public domain. This will help to avoid getting trapped in any of the misinformation.

Acquaintance with science and language of the issue:

It is important to express the story using the right language and apt scientific words. It will further help in communicating lucid stories to the general public.

Most of the time in disguise of pro ecological measures by the perpetrators needs to be evaluated critically and not misguided by the green washing.

Media documentation

Journalists must take all care to see what perspective of the footage is presented without bias. Always try to rely on first-hand information.

The <http://earthjournalism.net/> is an organization that has been working in training journalists to cover environmental issues. They have been working not only training but also monitoring the coverage as well as building a network of journalists virtually across the countries.

Credible sources

“Presenting multiple sides of a controversial issue allows the media to project an image of objectivity, even though all views are not rewarded with equal coverage. The media seek credible sources, but simultaneously present some sources as more credible than others” (Widener and Gunter 2007).

The challenge for young journalists is manifolds. One, how to bring back the issues of development vs environment in the mainstream media? Two, to understand the nuances of international politics and multilateral negotiations in the realm of Climate change. Three, to keep the focus on issues like pollution, emission and save it from being relegated to seasonal bursts at the time of parali in the northern parts of the country. And the biggest challenge is to navigate these stories through the editorial maze which has moved away from the most pressing issues of our times.

Perhaps, the time has come to go back to the drawing board. Tell the stories from the point of view of the people who are most affected by the environmental degradation and politics of it. At the centre of climate change to pollution, and to unsustainable development is the poor- the most poor and marginalized communities of this country and the world.

#### **10.4 IMPACT OF MEDIA COVERAGE OF ENVIRONMENTAL ISSUES:**

Journalists cover a wide range of topics, including:

1. Climate Change: Reporting on the impacts of climate change, adaptation measures, and India's contributions to global climate efforts.

2. **Wildlife Conservation:** Covering stories on endangered species, conservation efforts, and the challenges faced by India's diverse wildlife.
3. **Natural Disasters:** Reporting on natural disasters such as floods, droughts, and cyclones and their environmental consequences.
4. **Air and Water Pollution:** Investigating pollution sources, its effects on health and the environment, and government initiatives to combat it.
5. **Biodiversity:** Highlighting India's rich biodiversity, efforts to protect it, and the threats it faces.
6. **Environmental Policies:** Analyzing government policies, regulations, and their impact on the environment.
7. **Renewable Energy:** Covering developments in renewable energy sources, such as solar and wind power.
8. **Sustainable Practices:** Reporting on sustainable agriculture, eco-friendly technologies, and practices promoting sustainable living. There are a number of organizations specifically focusing on highlighting the plight of environmental conditions through awarding journalists and media organizations. Institutes include Greenpeace, Society for Environmental Journalists ([www.sej.org](http://www.sej.org)), and Covering climate now etc.

Green peace United Kingdom project listed nine most influential reports that helped the world in fighting against environmental disasters in the year 2019 (refer the report in the suggested readings). Some of the worthy mentions are how forest conservators from World Wide Fund for Nature (WWF) have been torturing the indigenous people in Nepal by the journalists Tom Warren and Katie J.M Baker from Buzzfeed News. Lee Fang from The Intercept exposed the powerful oil companies syndicate influencing laws in the United States to criminalize the environmental protest.

The call for green energy is promising and adoption to battery operated vehicles and other appliances reduce the carbon emissions. But the waste generated from electronics is not much taken care of. The e-waste has been mounting in the countries which are ahead in this adoption. Antonia Timmerman from [www.restoftheworld.org](http://www.restoftheworld.org) provided how China's electronic revolution impacted the people of Indonesia for mining and processing of nickel. We can say these are the perils of development.

## **10.5 TOWARDS AN ENGAGING REPORTING: THE FUTURE**

Seelig (2019) explains what is the nature of the media (on TV, in films, and on the Internet) towards the environment. The main focus point of this essay is that apart from just regular TV or movie theatres, the main goal shown is to make people interesting through shows and videos and inspire them to become conscious and protectors of the environment. Through TV, films, and the internet, people have to be made conscious and aware of the environment in their minds while having fun. This essay shows that the environment has now become more important in the popular media, rising above the surface. Media professionals are now creating entertaining content that also contains important ideas about the environment so that people can understand why it is important.

TV and film producers were not aware of environmental issues for most of the 1900s, but things began to change during the 1990s. The trend of environment related news started in mainstream news and a person named Ted Turner was included in environment related topics. Started making environment related shows called Network Earth, Earth Matters and



Next@CNN on TV channels like TBS and CNN. Following this trend, other major TV channels like Discovery Channel and Outdoor Life Network started producing shows about nature, outdoors and environment. Apart from this, these channels also air environment-based shows on other channels owned by them, such as The Learning Channel, Science Channel, Planet Green and Animal Planet. Major channels Outdoor Channel and ESPN began broadcasting outdoor activities such as camping, fishing and hunting. Besides, the things that harm the environment were also prominently broadcasted through the show so that people could understand what harms the air, water and land. Discovery Channel through Amazon Prime and YouTube started putting its shows on digital platforms so that people around the world become aware and conscious about the environment and can clean the environment.

National Geographic Channel is known worldwide for its environment-based shows. This channel is known for running environment related shows 24 hours a day. It produced documentaries and special shows about things that harm the environment. They also put their content on the Internet through services like iTunes and Netflix, as well as the National Geographic app. In 2008, the world-famous Disney also created a special unit to make films about nature and started producing environment related films called DisneyNature. These films tell people how beautiful our nature is and how humans are destroying it for their own profit.

The Intergovernmental Panel on Climate Change (IPCC) revealed that by 2015 greenhouse gas emissions will reach a peak. It is already witnessed in Europe and other parts of the world in different forms. Similarly International Public Opinion on Climate Change, 2022 has found that climate change is happening and mostly the government policies in the world need proactive steps towards saving the earth. Society for Environmental Journalists asserted that local news reporting must be encouraged. Their observation found that local journalism has been disappearing, so it is important to have responsible regional and local journalism initiatives to keep a watch on ecological issues.

These journalists also face challenges, including issues of access, transparency, and the need to balance commercial interests with environmental reporting. Despite these challenges, their work remains essential in raising awareness, holding authorities accountable, and driving positive change in India's environmental landscape.

## **10.6 SUMMARY**

Environmental journalism is crucial in documenting environmental concerns like climate change, conservation, pollution, and sustainability. It promotes awareness and encourages proactive measures towards environmental issues, particularly in the pursuit of Sustainable Development Goals. Media plays a significant role in delivering objective and balanced environmental news, prioritizing environmental measures, and upholding principles of openness and accountability. The Deep Water Horizon oil leak serves as an example of how media coverage can effectively bring environmental issues to the forefront. The lesson emphasizes the importance of precise information, scientific terminology, and reliance on reputable sources. Organizations like The Third Pole and Earth Journalism Network have made significant contributions to environmental journalism. The paper concludes by focusing on the future trajectory of engaging environmental reporting and acknowledging the challenges faced by environmental journalists.

## 10.7 TECHNICAL TERMS

### **Environmental Journalism**

Environmental journalism constitutes a specialized branch of journalism dedicated to the comprehensive coverage, investigation, and examination of matters pertaining to the environment and its ramifications for society. This specialized field encompasses a diverse array of subjects, encompassing climate change, conservation, pollution, sustainability, natural disasters, wildlife, and the intricacies of environmental policies.

### **Credible source**

While writing the news reports it is important to get the information from all the authentic sources. Journalists have to verify the facts before filing the story. Government agencies, interaction with the victims in the field and other reliable sources are important credible sources.

### **Climate change**

Climate change refers to significant and lasting alterations in the long-term patterns of temperature, weather conditions, and other climate-related factors on Earth. These changes are primarily driven by human activities.

### **Green washing**

Green washing is a deceptive marketing practice in which a company or organization exaggerates or misrepresents its environmental efforts or the environmental benefits of its products, services, or policies to appear more environmentally friendly than it actually is.

### **Objectivity**

Objectivity in the context of media coverage is against the hidden agenda of the profit oriented nature of media. The aim is to provide truth and critical analysis of the event to bring awareness and critical consciousness among masses.

## 10.8 SELF-ASSESSMENT QUESTIONS

1. What are the best practices for reporting environmental issues?
2. Explain the role of the media in reporting environmental issues in the public domain?
3. Discuss the need for objectivity in reporting the environmental issues?
4. Analyse any two environmental issues in your area and its coverage of media?

## 10.9 SUGGESTED READINGS

1. .Haller, L. (2011). Lesson not learned: Deepwater Horizon research and media coverage exposes gaps in knowledge and risky protocol within the oil industry.
2. <https://unearthed.greenpeace.org/2019/12/26/best-environmental-journalism-2019/>
3. Leiserowitz, A., Carman, J., Buttermore, N., Neyens, L., Rosenthal, S., Marlon, J., Schneider,
4. J., & Mulcahy, K. (2022). International Public Opinion on Climate Change, 2022. New Haven, CT: Yale Program on Climate Change Communication and Data for Good at Meta

5. Kumari, S. (2023, September 27). Climate change glossary: The terms you need to understand, explained. The Third Pole. <https://www.thethirdpole.net/en/climate/climate-change-glossary/>
6. Widener P, Gunter VJ. 2007. Oil Spill Recovery in the Media: Missing an Alaska Native Perspective. *Society and Natural Resources* 20:767-783.
7. Reuters, A. M. /. (2015, December 2). Arun Karki: Reporting without A home. Dart Center. <https://dartcenter.org/content/arun-karki-reporting-without-home>
8. Seelig, M. I. (2019). Popularizing the environment in modern media. *The Communication Review*, 22(1), 45-83.
9. Staff, U. (2020, January 7). The Best Environmental Journalism of 2019. <https://unearthed.greenpeace.org/2019/12/26/best-environmental-journalism-2019/>

Dr. Shankar Krishna Kusuma

# LESSON 11

## ROLE OF ALTERNATIVE MEDIA FOR ENVIRONMENT

### OBJECTIVES

- To understand the role of media coverage on environmental issues
- To learn about communicating climate change
- To study the role of social media in highlighting the environmental issues
- To get awareness about media and sensitization campaigns

### Structure

- 11.1 Introduction
- 11.2 Alternative media for environment
- 11.3 Environmental Media Campaigns
- 11.4 Professional societies for environmental journalists
- 11.5 Games for social change: Environmental approach
- 11.6 Summary
- 11.7 Technical Terms
- 11.8 Self-Assessment Questions
- 11.9 Suggested Readings

### 11.1 INTRODUCTION

Climate change, global warming, pollution, and natural disasters have become significant global concerns, capturing the attention of people worldwide. Media also plays a pivotal role in addressing these challenges. Not only do various governments express their concerns, but environmental activists and the common public are also vocal about these issues. Consequently, the media serves as a platform for articulation and mobilization on these environmental matters. Hence, the role of media, particularly its modern tools, has grown in significance regarding environmental issues. In our current global networked media landscape, it plays a crucial role in addressing these challenges.

Chipko andolan, fueled by passion of its main protagonist, the saintly environmental warrior Chandi Prasad Bhat, and coupled by Agarwal's relentless pursuit of reporting it put a significant thought in the nation's collective consciousness- That the biggest stakeholder in environmental issues are the poor of the country. This became the central idea of many significant movements to follow and put the environment and development on India's media map. Most important and widely reported were Silent Valley Protest in Kerala where the local community fought to protect the rainforests from being submerged due to construction of a hydro project, and later, Narmada BachaoAndolan which took the debate of environment vs development to a whole new level. Darryl Demonte, the Bombay based journalist who also held senior editorial positions in The Times of India and The Indian Express, was at the forefront of reporting the Silent Valley protest and many more such battles.

The 'environmentalism of the poor' remained the central point of developmental journalism through the early part of 90's. Agarwal and other campaign journalists were able

to put words like nature, sustainability, community ownership, common resources and the poor's stake holding in the mainstream media. Agarwal is also credited for bringing attention to urban issues to the fore in the mid-nineties. A sustained campaign and advocacy on the issue of urban vehicular pollution brought a turning point in environmental journalism. The issue of dirty diesel in Delhi made into national discourse and was finally settled by the supreme court. CNG became the fuel of the entire public transport fleet in Delhi. This was replicated quickly in other major cities. In many ways, it was a watershed moment in Indian environmental journalism which shifted from rural development vs environment issues to urban middle class issues like pollution, emissions, and plastic menace. This shift, for the first time, brought environmental issues to the city pages of the newspapers and metro bulletins of news channels.

## 11.2 ALTERNATIVE MEDIA FOR ENVIRONMENT

Traditionally, environmental awareness relied on conventional media such as pamphlets, small magazines, and folk media like street performances. However, with the advent of the internet and the proliferation of digital media platforms, a new wave of internet-driven environmental alternative media has surfaced. Websites and social media platforms are now used as alternative media for environment campaigns. YouTube is also used for public engagement on this matter. These tools have not only offered a global reach to local environmental campaigns but have also interconnected global environmental initiatives. For example, worries about global warming are not limited to Western nations but are also being voiced in Asian countries such as India. Manuel Castells argues that within the global networked society, online social networks are vital components of the environmental movement. The internet has notably enhanced the campaigning effectiveness of environmental groups and fostered increased international collaboration (2009, p. 325).

Social media is harnessed by governments, different institutions, NGOs, and activists to enhance public engagement with environmental issues. In this digital landscape, the public can voice their opinions and actively participate in online environmental campaigns, collectively shaping the environment debates. It has created possibilities of greater and global public engagement. Thus, social media also creates digital environmental publicity. Hence, the internet based digital platforms have emerged as an alternative media for environment purposes.

Documentaries have been one of the effective alternative media before the start of 24/7 satellite channels and as well as the internet era. India has produced several notable environmental documentaries that shed light on various environmental issues and conservation efforts. The documentaries provided below in different themes, but not limited to mention below:

### **Water Conservation and Environmental Activism:**

"Waterman of India" (2007): This documentary is a tribute to Rajendra Singh, an environmentalist who has worked extensively on water conservation in Rajasthan, India.

### **Climate Change and Global Impact:**

The Age of Stupid (2009) is a British film; it highlights the global issue of climate change, with a section dedicated to the impact on India.

**Energy Crisis and Social Issues:**

Katiyabaaz (2014): A documentary about the power crisis in Kanpur, India, and the efforts of individuals and organizations to address it. It underscores environmental and social issues linked to energy consumption.

**Wildlife Conservation:**

The Tiger's Fight (2016): This documentary provides insights into India's efforts to protect its tiger population and conserve their natural habitat. It showcases the challenges of wildlife conservation in India.

**Spiritual and Ecological Significance of Rivers:**

Ganga: The Soul of India (2014): A series of documentaries that delve into the spiritual and ecological significance of the Ganges River and the threats it faces.

**Ecosystem and Biodiversity:**

The Secret Life of Frogs (2018): A documentary that explores the world of frogs in the Western Ghats of India, emphasizing the importance of amphibians in the ecosystem.

**Climate Activism:**

Climate Warriors (2018): A documentary by the British Council India that profiles Indian climate activists and their efforts to combat climate change.

**Water-Related Issues:**

One Water (2008): An exploration of water-related issues in India, including the impact of industrial pollution and efforts to provide clean water.

**Dams and Their Impact:**

Nero's Guests - Directed by Deepa Bhatia, this documentary explores the agrarian crisis and farmer suicides in India, often linked to issues related to dams, water management, and agricultural practices.

Damned - Directed by Anand Patwardhan, this documentary delves into the controversial Sardar Sarovar Dam project and its effects on the displaced populations and the environment.

Rising Silence - Directed by Leena Manimekalai, this documentary highlights the struggles faced by the displaced communities due to the construction of the Mullaperiyar Dam in Kerala.

Mujhe Chand Chahiye - Directed by Shriprakash, this documentary examines the impact of the Tehri Dam in Uttarakhand on the lives of local communities and the environment.

The Narmada Diary (1995) Directed by Anand Patwardhan, this documentary follows the Narmada BachaoAndolan (NBA) movement and the protests against the Sardar Sarovar Dam on the Narmada River.

Jeevika: Facing Water Crisis - Directed by National Geographic, this documentary explores the challenges faced by the people of the Marathwada region in Maharashtra due to water scarcity, droughts, and dam-related issues.

**Uranium Mining and Environmental Impact:**

Buddha Weeps in Jadugoda (1999) is a documentary film directed by Shriprakash. The documentary sheds light on the uranium mining activities in Jadugoda, Jharkhand, India, and the detrimental impact of these operations on the local Adivasi communities and the

environment. The film raises awareness about the health hazards and environmental degradation caused by uranium mining.

These documentaries cover a wide range of environmental and social issues in India and are valuable contributions to raising awareness and fostering discussions on these topics.

These documentaries serve to educate, inspire, and raise awareness about the environmental challenges facing India and the world. They also highlight the positive actions being taken to address these issues and promote sustainability.

### 11.3 ENVIRONMENTAL MEDIA CAMPAIGNS

By the turn of the century, every newsroom had an environment as an important and standalone beat. Environmental journalism in India had arrived. But not without its own issues.

Events like melting of icebergs and rising sea levels, manifested in the form of erratic weather patterns put global media's focus on issues like climate change and global warming. The raging global debate sharply divided the world into north (developed) and south (developing and under-developed). This soon turned into ferocious (and rightly so) international politics and negotiations with the north asserting its right to emit and the south fighting for its right to develop. The successive CoP (conference of parties)- an UN based multilateral platform became the core focus of the media. It relegated the 'old' developmental issues from the front pages of newspapers to the inner fold. Urban issues remain the mainstream on city pages but the political shift after liberalization and demand for quick development put the core environmental issues to the backburner. Fast paced development henceforth has decidedly put the core and very relevant environmental issues to bed. Several news reports on blatant anti-environment policies hardly find resonance with masses, mainly because of hard-nosed politics and mainstream media's apathy.

The most engaging and interactive stories and campaign created by the following media:

"The Great Climate Change Challenge" is a notable environmental initiative by NDTV (New Delhi Television Limited), a prominent Indian television news channel. This campaign is designed to address the critical issue of climate change and raise awareness about its impact on the environment and society.

The initiative involves a series of television programs, documentaries, and online content that focus on various aspects of climate change, including its causes, consequences, and potential solutions. It aims to educate the public about the urgency of climate action and promote sustainable practices.

Through "The Great Climate Change Challenge," NDTV encourages viewers and the public to take action to combat climate change and reduce their carbon footprint. The campaign also emphasizes the importance of environmental conservation and highlights the need for collective efforts to address this global challenge.

The other television channel Network18's campaign 'Mission Swachhta Aur Paani' (<https://www.news18.com/missionswachhtapaani/>) is about the clean environment and water. There are a range of issues including garbage. The "world Toilet College" has transformed

many women working in vulnerable conditions to inspiring change makers across India. It has been working mostly in the urban and mega cities towards cleaner and greener solutions. Efforts of waste management and identifying change agents to participate in the campaign became successful and inspiring. Dumping, civic sensitization towards cleanliness and open defecation, polluting water bodies etc.

Seelig (2019) explains through TV, films, and the internet, people have to be made conscious and aware of the environment in their minds while having fun. This essay shows that the environment has now become more important in the popular media, rising above the surface. Media professionals are now creating entertaining content that also contains important ideas about the environment so that people can understand why it is important.

The trend of environment related news started in mainstream news and a person named Ted Turner was included in environment related topics. Started making environment related shows called Network Earth, Earth Matters and Next@CNN on TV channels like TBS and CNN. Following this trend, other major TV channels like Discovery Channel and Outdoor Life Network started producing shows about nature, outdoors and environment. Apart from this, these channels also air environment-based shows on other channels owned by them, such as The Learning Channel, Science Channel, Planet Green and Animal Planet. Major channels Outdoor Channel and ESPN began broadcasting outdoor activities such as camping, fishing and hunting. Besides, the things that harm the environment were also prominently broadcasted through the show so that people could understand what harms the air, water and land.

Discovery Channel through Amazon Prime and YouTube started putting its shows on digital platforms so that people around the world become aware and conscious about the environment and can clean the environment. National Geographic Channel is known worldwide for its environment-based shows. This channel is known for running environment related shows 24 hours a day. It produced documentaries and special shows about things that harm the environment. They also put their content on the Internet through services like iTunes and Netflix, as well as the National Geographic app. In 2008, the world-famous Disney also created a special unit to make films about nature and started producing environment related films called DisneyNature. These films tell people how beautiful our nature is and how humans are destroying it for their own profit.

**Film festivals & Awards:** The awards and fellowships serve to motivate and acknowledge individuals and organizations that have made significant efforts to protect and conserve India's environment, wildlife, and natural resources. They play a crucial role in encouraging further work in the field of environmental conservation and sustainability.

Centre for Media and Society (CMS) conducts every alternative year Vatavaran (climate) film festival. The themes of the film festival include environments, climate change and wildlife. It has been playing a crucial role in encouraging film makers to think and document the environmental situation in India from 2002. Over the years the festival has been a voice to and place to debate pressing issues through visual media not only in India but also in south Asia and internationally.

The Ministry of Environment & Forest in India presents a range of prestigious environmental awards and fellowships to individuals and organizations in recognition of their



significant contributions to environmental conservation and protection. Jeevika is one of the Asia Livelihood documentary festivals that encourage films on environmental issues.

#### **11.4 PROFESSIONAL SOCIETIES FOR ENVIRONMENTAL JOURNALISTS**

In India, there are professional societies and organizations that support and promote environmental journalism. These societies provide a platform for environmental journalists to network, share knowledge, and collaborate on environmental reporting. Some of the notable professional societies for environmental journalists in India include:

**Society of Environmental Journalists (SEJ) - India:** SEJ-India is a regional chapter of the global Society of Environmental Journalists. It aims to promote and enhance environmental journalism in India. The organization conducts workshops, seminars, and training programs for environmental journalists and provides a platform for networking and collaboration.

**Indian Science Journalists' Association (ISJA):** While not exclusively focused on environmental journalism, ISJA provides a platform for science journalists, and environmental reporting often intersects with science journalism. They organize workshops, seminars, and conferences to promote quality science communication.

**The Media Foundation:** The Media Foundation is an independent, non-profit organization that supports investigative journalism, including environmental journalism. They provide fellowships, grants, and conduct training programs to encourage in-depth reporting on various issues, including the environment.

**Centre for Science and Environment (CSE):** CSE is a research and advocacy organization in India that works extensively on environmental issues. They offer various training programs and workshops for journalists on topics related to environmental reporting, sustainable development, and public health.

**The Earth Journalism Network:** While not India-specific, this network connects environmental journalists worldwide and provides resources, training, and opportunities for environmental reporting. It often collaborates with Indian journalists and media outlets.

**Down To Earth:** Although not a professional society, Down To Earth is a publication that focuses on environmental issues in India and is known for its in-depth reporting. They frequently collaborate with journalists and organizations interested in environmental reporting.

These organizations and societies play a crucial role in supporting environmental journalism in India by offering training, resources, and opportunities for journalists to effectively cover environmental issues. Journalists interested in environmental reporting can benefit from joining these organizations and participating in their activities and programs.

#### **11.5 GAMES FOR SOCIAL CHANGE: ENVIRONMENTAL APPROACH**

Lifestyle in a metro city is slowly starting to comprehend environmental change, not just in terms of air and water quality, but also the grave impact of micro plastics and such other harmful substances that are part of a daily lifestyle. Research findings indicate that there are far and irreversible effects of climatic change happening away from the city which

will soon start to impact the daily lives of people who frequently discuss rhetoric on the damage being done to the environment.

Apart from non-sustainable practices, the country today is facing problems with segregation of waste as well as the intent towards fast consumption which leads to such waste. Extreme weather conditions have become the new normal during India's peak monsoon season, which includes June 5 conferred the World Environment Day. Major resources like fertile land for cultivation, lakes, rivers and other natural water bodies are now bearing the brunt of depleting forest cover. Human carbon footprint is now emerging as a threat to other species, flora fauna. This is a trend that has been recurrently affecting the GDP of the country. Apart from prominent influencers and role models, promoting the right practices in mainstream media, the real fight still remains about mass awareness at the ground level. It is only through making people understand how individual participation matters can a low waste lifestyle be implemented. It is necessary to engage people in mainstream media like tangible and digital advertisements, discussion forums through podcasts, festivals and participatory workshops. However alternate media can play a pivotal role in this direction.

Start-ups in India have begun to curate board games that aim to sensitize players to the challenges and solutions with respect to the environment. Upcyclor, a Mumbai-based lab has developed card game called waste warriors, where players have to strategies segregation of waste correctly to win the game. FSC certified paper is used to make components of this board game to make it a responsible effort. The game is designed for kids aged five years and above and can be played by fly by a maximum of four players who need to segregate waste in categories of safe disposal, recyclable, compostable and hazardous. Another popular board game is Green Day designed by United Kingdom champs from Hyderabad for children above the age of three. To win the game players need to opt for green alternatives such as wooden cutlery, cloth, bags, steel and terracotta, utensils and finished tasks sustainably. The components of such games are carefully designed using sustainable materials like recycled paper, wood, and are also printed using organic dyes which can promote the right culture and context as alternative media. Online games are also powerful tools to sensitize the public, especially youth for social change in the context of environmental awareness. Their immersive and interactive natures play a crucial role in this process. These games prompt players to adopt behaviour change regarding environmental concerns. There are many online games such as 'Eco', 'Save the Park', and 'Clam City' available for this purpose. Thus, games have emerged as an alternative media for environment awareness.

## 11.6 SUMMARY

In recent years, global environmental concerns, such as climate change, pollution, and natural disasters, have gained unprecedented attention, drawing governments, environmental activists, and the public into discussions about these critical challenges. Media has emerged as a pivotal platform for addressing these issues, enabling both local and global voices to be heard. This transition to a more prominent role for media, especially digital platforms and social media, reflects the urgency of environmental challenges in today's interconnected world. Furthermore, documentaries, environmental campaigns, and games have become powerful tools in raising awareness and promoting sustainable practices. Notably, environmental documentaries in India cover a wide range of topics, from water conservation to wildlife protection, while environmental campaigns, such as "The Great Climate Change Challenge" and "Mission *Swachhta Aur Paani*," aim to engage the public and encourage

collective efforts toward climate action. Additionally, innovative board games and online games are helping sensitize individuals, particularly the youth, to environmental challenges and inspiring behaviour change for a sustainable future. Together, these forms of media play a crucial role in shaping public perceptions and encouraging environmental activism.

This transformation in the media's role is driven by the need to address environmental concerns on multiple fronts, from local community issues to global climate change debates. The rise of alternative media, particularly digital platforms and social media, has given voice to environmental campaigns, resulting in a more interconnected and aware global public. Moreover, professional societies for environmental journalists offer support and resources for quality environmental reporting, ensuring that these issues remain in the forefront of media attention. As the world grapples with environmental challenges, the media has become a powerful ally in advocating for sustainability, conservation, and collective action to address these pressing global issues.

### 11.7 TECHNICAL TERMS

1. **Society of Environmental Journalists (SEJ) - India:** SEJ-India is a regional chapter of the global Society of Environmental Journalists.
2. **Indian Science Journalists' Association (ISJA):** While not exclusively focused on environmental journalism, ISJA provides a platform for science journalists, and environmental reporting often intersects with science journalism.
3. **Centre for Science and Environment (CSE):** CSE is a research and advocacy organization in India that works extensively on environmental issues.
4. **The Earth Journalism Network:** While not India-specific, this network connects environmental journalists worldwide and provides resources, training, and opportunities for environmental reporting. It often collaborates with Indian journalists and media outlets.

### 11.8 SELF-ASSESSMENT QUESTIONS

1. Discuss the importance of any two documentaries made on environmental issues?
2. Explain the role of alternative media in environmental protection and advocacy?
3. Name any two film festivals which provide space for films about the environment?
4. Examine how games can help in environmental consciousness among the masses?
5. Examine any two professional societies, which are working for protection and creating dialogue on the environment?

### 11.9 SUGGESTED READINGS

1. Jayasankar, K. P., & Monteiro, A. (2015). A fly in the curry: independent documentary film in India. SAGE Publications India.
2. Seelig, M. I. (2019). Popularizing the environment in modern media. *The Communication Review*, 22(1), 45-83.
3. <https://www.downtoearth.org.in/>

**Dr.Shankar Krishna Kusuma**

## LESSON 12

# GREEN MARKETING AND CORPORATE MEDIA CAMPAIGN

### OBJECTIVES

After reading the lesson, the reader should be able to gain an overview of the concept of Green marketing and the role of corporate campaigns for sustainable development.

Key objectives of this lesson are:

- To understand the definition of Green marketing
- To learn about the practices of Green marketing and Green consumer
- To analyse the best practices of Green marketing
- To get awareness about the eco-friendly initiatives of the corporates

### Structure

- 12.1 Introduction**
- 12.2 Best practices for Green Marketing:**
- 12.3 Corporate Social Responsibility (CSR)**
- 12.4 Environmental initiatives by consumer brands**
- 12.5 Critical evaluation of Green marketing**
- 12.6 Summary**
- 12.7 Technical Terms**
- 12.8 Self-Assessment Questions**
- 12.9 Suggested Readings**

### 12.1 INTRODUCTION

The awareness and media campaigns are necessary for reducing the damage to the environment. It is also important that each product and service should take their proactive steps in pushing the agenda of environmentally friendly habits and practices.

According to the American Marketing Association, green marketing is the marketing of products that are presumed to be environmentally safe. The concept of 'Green marketing' is an eco-friendly practice in the products and services which not only help the consumer but also the environment. Further Green marketing works as a campaign and advocacy to promote and publicize best practices for an environmentally friendly society. It helps in sustained efforts with an ecological friendly business with social responsibility. Consumers will not only buy the products but also be influenced by the green marketing efforts.

The concept of green marketing emerged as a significant phenomenon throughout the latter part of the 1980s and the early years of the 1990s. The origins of this concept can be traced back to the inaugural workshop on "Ecological Marketing," which was organized by the American Marketing Association (AMA) in 1975. Philip Kotler propagated the social marketing concept where consumers will benefit and along with their desired goods and services. He calls it a sustainable marketing strategy. Lynn R. Kahle research on Green marketing and sustainability helped in understanding consumer psychology and behavior

towards it. Some of the findings revealed that some of the consumers are conscious about the environment while buying the product where the purchase decision also depends on the products viability to a healthy environment. He talked about green consumerism where the traditional values linked with the environment help poster their choices toward the products that value the environment.

Green marketing encompasses a wide spectrum of actions and strategies aimed at promoting environmentally responsible and sustainable products and practices. These initiatives may involve altering product features, adapting manufacturing methods, revising packaging materials, and adjusting advertising content to emphasize eco-friendliness. Green marketing is a multifaceted approach that seeks to align businesses with the principles of environmental sustainability and cater to the growing consumer demand for products and services that are both ethically and environmentally sound. By integrating these various elements, companies can not only meet the expectations of environmentally conscious consumers but also contribute to a more sustainable future.

Green consumer: According to the definition provided by Henion and Kinnear (1976), green consumers can be characterized as persons who place a high level of importance on environmental consciousness when making decisions related to consumption. The influence of media and peer groups is significant in affecting consumer behavior. According to Antil (1984), green consumerism can be defined as a distinct manifestation of socially conscious consumer behavior that is primarily focused on the preservation of the environment.

The top scoring consumers in the "Consumer Greendex" survey conducted by the National Geographic Society and the international polling firm Globescan (2010) were in the developing economies of India, Brazil, and China, while industrialized countries ranked at the bottom.

Selig (2019) explains what is the nature of the media (on TV, in films, and on the Internet) towards the environment. The main focus point of Selling is that apart from just regular TV or movie theaters, the main goal shown is to make people interested through shows and videos and inspire them to become conscious and protectors of the environment. With the above concepts, every consumer is encouraged to participate in saving the environment.

## **12.2 BEST PRACTICES FOR GREEN MARKETING:**

### **1. Packaging and labelling:**

It is important to promote environmental messages through possible means. Packaging has been one the new age business increased to new heights of demand due to online e-commerce business. Product packaging requires a variety of material to protect the freshness, quality and damages during transit. Packaging material as part of eco-friendly efforts requires it to be used consciously. Otherwise the packaging waste has been resulting in huge landfills has been another bigger issue emerging in India. One of the marketing solutions organizations [www.greenbusinessbureau.com](http://www.greenbusinessbureau.com) has suggested that use of biodegradable materials instead of Styrofoam, instead of corrugated bubble wrap up-cycled corrugated cardboard, cornstarch packing, mushroom packing, seaweed packing, edible material for packing may be used. Over the years news means of packing has been emerging. Advocating the manufacturers to adopt them is the way forward.

The consumer goods providing the energy savings or consumption capabilities of electrical goods will always alert the buyer to choose the products which consume less power as well as be environmentally friendly.

### **2. Information regarding the product impact on environment:**

Every advertisement like tobacco products should display the harmfulness of the product and also careful guidelines to destroy safely after its use should be made as part of the manufacturing and selling of goods.

### **3. Guidelines for after life of the product:**

Electronic waste management has been one of the daunting issues these days as a rapid increase in the consumption of electronic goods. The mobile phone companies use lithium batteries. The expiration of the battery needs to be safely disposed of. Mobile companies in India largely encourage consumers to use the facilities in their designated stores or they will keep the kiosks for collection of used phones. Lithium and other kinds of batteries used in various electronic products are harmful for the environment. It is important to increase the campaign for greater civic participation.

## **12.3 CORPORATE SOCIAL RESPONSIBILITY (CSR)**

Green marketing and CSR are inextricably linked, with green marketing frequently functioning as a visible representation of a company's commitment to sustainability within the broader framework of CSR. CSR is a combination of economics, society and environment. Corporates are one of the major contributors of environmental destruction. It is important to consider the protection of ecology through keeping some of their profits for CSR initiatives. Companies that successfully incorporate these principles display a comprehensive approach to environmental and social responsibility, which can help them, build their brand and image.

Some of the responsibilities include efforts to minimize the impact on the environment, ethical business practices, Philanthropy and community engagement, transparency and engagement.

The engagement with the consumers is here as a social community where sharing of profits or certain funds to give it back to the society in the form of greater public help.

The pressure on the corporations to comply with the environmental concerns it is essential to maintain Green Corporate Image (GCI) has been a mandatory exercise. These measures will result in Environmental Corporate Social Responsibility (ECSR) towards more sustainable societies. Supporting the projects and innovative initiatives for waste management, consumer well-being, and ecology through CSR or environmental philanthropy is required.

Organizations recognize environmental marketing as a strategic avenue for accomplishing their corporate goals. They have come to understand that contemporary consumers exhibit a preference for products that not only meet their needs but also demonstrate a commitment to environmental and human health preservation. Firms that actively engage in marketing these eco-friendly products are viewed favorably in contrast to those that do not, thereby gaining a competitive edge while concurrently fulfilling their

business objectives. These organizations perceive a moral responsibility to exhibit greater social conscientiousness, aligning with the principles of Corporate Social Responsibility (CSR) which have been successfully embraced by numerous enterprises to enhance their corporate image.

In this context, businesses can adopt two fundamental approaches: either leveraging their environmental responsibility as a marketing tool or actively developing innovative eco-friendly consumer products. The paper also provides illustrative examples of such innovative products currently in development, including a biogas-based power plant and an electric vehicle powered by polymer lithium-ion batteries. (Mishra, P., & Sharma, P.2010).

## 12.4 ENVIRONMENTAL INITIATIVES BY CONSUMER BRANDS

Corporations have social responsibility towards society is shown in different ways. One of the ways is to run campaigns aimed to bring positive social change.

In the year 2011, Patagonia, a prominent producer of outdoor gear, disseminated an advertisement in The New York Times on the occasion of Black Friday, wherein they advocated for individuals to exercise restraint in acquiring their merchandise, unless it was regarded as indispensable. The program focused considerable emphasis on the reduction of both consumption and waste.

The airlines are also promoting digitization of the entire process to reduce the carbon emissions.

In 2014, IKEA introduced a sustainability effort known as "People and Planet Positive" with the objective of mitigating its ecological footprint. The campaign encompassed pledges to utilize sustainable materials, advance energy efficiency, and foster the production of renewable energy.

Several Indian companies have implemented a variety of green marketing initiatives. The "*Jaago Re*" campaign of Tata Tea, launched in 2008, Tata Tea initiated the "*Jaago Re*" campaign with the objective of enhancing societal consciousness pertaining to many social concerns, encompassing the realm of environmental preservation. The campaign sought to promote a heightened sense of civic responsibility among individuals and underscored the significance of engaging in the electoral process.

The e-Chou pal initiative, launched by ITC in 2000, sought to enhance the agency of rural farmers through the provision of information, technology, and market access. The implementation of measures that decrease the necessity for physical travel and paperwork has had a positive impact on sustainability and the well-being of farmers.

In 2017, Mahindra Electric, a part of the Mahindra Group, initiated a campaign titled "The Future of Mobility is Electric" with the objective of advocating for electric vehicles (EVs) as a means of transportation that is both environmentally benign and sustainable. The primary objective of the campaign was to mitigate air pollution levels and encourage the widespread adoption of electric vehicles (EVs).

In 2007, Dabur, a prominent fast-moving consumer goods (FMCG) firm in India, launched "Project Prayas" with the objective of fostering environmental preservation and the principles of sustainability. The campaign encompassed initiatives aimed at mitigating carbon

emissions, conserving water resources, and advocating for the adoption of environmentally sustainable products.

Celebrations during the wedding in India has been one of the events where a great amount of savings are spent to showcase and celebrate the moment. But it actively contributes to the wastage of food and night weddings consume a great amount of power and harm the birds and insects. The event known as "Green Wedding" took place on Titan in 2018. Titan Company, a prominent horological manufacturer, has pioneered the notion of "Green Weddings" through the advocacy of environmentally conscious jewelry, sustainable packaging, and ethically sourced materials. The objective of this campaign was to promote sustainability within the context of weddings.

Marico's "Saffola" brand initiated a promotional effort in 2016 to advocate for the adoption of sustainable palm oil. The ad placed emphasis on the practice of responsible sourcing and underscored the need of selecting products that incorporate sustainable components.

The "Livaeco" brand was created by the Aditya Birla Group in 2018, with a focus on promoting sustainable and environmentally friendly fashion. The campaign advocated for the adoption of sustainable textiles and the adoption of ethical fashion choices.

Hero Moto Corp's "Green Mobility" initiative, launched in 2020, focuses on promoting environmentally friendly transportation solutions. Hero MotoCorp, a prominent player in the Indian two-wheeler manufacturing industry, recently initiated the "Green Mobility" campaign. This strategic endeavor aims to raise awareness and promote Hero MotoCorp's assortment of electric scooters and bikes as a viable and environmentally conscious substitute to conventional gasoline-powered vehicles.

Swiggy, a prominent food delivery company, just launched the "Swiggy Go Green" campaign in 2021. This program aims to promote the use of environmentally friendly packaging options among customers while placing their food orders. The objective of the campaign was to mitigate the environmental impact caused by the disposal of single-use plastic materials.

Tata Power's "Act for Green" initiative, launched in 2018, Tata Power initiated the "Act for Green" program with the objective of fostering energy saving and sustainable behaviors. The effort aimed to promote the adoption of energy-efficient appliances and habits among customers, with the goal of mitigating their carbon footprint.

## 12.5 CRITICAL EVALUATION OF GREEN MARKETING

### **Green washing:**

One has to understand the dilemmas in development with the concept of Green washing in the context of green marketing. If a company provides misleading information to consumers, government and financiers it is called green washing. Further the company projects and claims that products are environmentally viable but in reality it is the opposite. The false claims to mislead the consumers in the name of eco-friendly products and services are dangerous.



The consumers should be aware about it and identify their claim by challenging it in the consumer forums and other media platforms. Some of the ways to identify are use of vague language, keeping the font size of the ingredients (in case of food items) in smaller size. The use of words like organic, natural, chemical free, preservative free kind of claims should be verified. Marketing team efforts to increase the sales, sometimes the product percentages and numbers may be not accurate and authentic as from the experts.

The ways customers should demand as well brands can compile with are accountability, clear labeling, accreditation, Traceability.

Regrettably, a prevailing misconception among the majority of individuals is that green marketing primarily entails the promotion or advertisement of products featuring environmental attributes. Commonly, consumers tend to associate green marketing with phrases such as "phosphate free," "recyclable," "refillable," "ozone friendly," and "environmentally friendly." However, it is essential to recognize that green marketing encompasses a broader and more encompassing concept. It can be applied not only to consumer products but also to industrial products and even services, despite the use of these specific terms in green marketing messaging (Polonsky, Jay M., 1994)

For instance, a notable illustration of this broader application is evident in the global trend where resorts are increasingly positioning themselves as "ecotourism" establishments. These resorts specialize in providing experiences that prioritize a minimal environmental impact while enjoying nature or conducting business. This demonstrates that green marketing extends beyond product-based promises and finds relevance across diverse sectors of the economy.

Re-use and recycling has been one of the viable solutions to electronic waste and all other kinds of waste. The amount of waste that is generated by various products from the mining to the end of shelf life of the product involves a number of stages. The campaign and green marketing initiatives should attempt to address each stage.

## **12.6 SUMMARY**

The introduction emphasizes the importance of awareness campaigns and proactive environmental practices for reducing environmental damage. It introduces the concept of "Green marketing," which promotes eco-friendly products and services while advocating for environmentally friendly practices in society. The emergence of green marketing in the late 1980s and early 1990s is traced back to the "Ecological Marketing" workshop organized by the American Marketing Association in 1975.

The concept of green marketing involves not only eco-friendly product offerings but also a broader campaign to encourage sustainable practices and ecological responsibility. It highlights the potential for businesses to engage in environmentally responsible practices while appealing to eco-conscious consumers.

Additionally, it mentions the role of key researchers like Philip Kotler and Lynn R. Kahle in understanding consumer psychology and behavior related to green marketing. The distinction between green consumers and their influence through media and peer groups is explained.

The section on best practices for green marketing underscores the significance of responsible packaging, information transparency, and post-consumption guidelines. It addresses the management of electronic waste and calls for greater civic participation.

The connection between green marketing and Corporate Social Responsibility (CSR) is discussed, emphasizing how green marketing can be a part of a company's broader CSR strategy. It touches upon CSR responsibilities such as environmental conservation, ethical business practices, philanthropy, and community engagement. Examples of environmental initiatives by consumer brands in India are highlighted, showcasing how companies promote sustainability through their products and campaigns. It includes initiatives by Tata Tea, ITC, Mahindra Electric, Dabur, Titan, Marico, Aditya Birla Group, Hero MotoCorp, Swiggy, and Tata Power.

The section concludes by addressing the issue of "green washing," where companies mislead consumers with false environmental claims. It calls for consumer awareness and vigilance in identifying and challenging misleading green marketing claims. Overall, the text provides a comprehensive overview of green marketing, its best practices, the relationship with CSR, and real-world examples of environmental initiatives by consumer brands. It also emphasizes the importance of transparency and accountability in green marketing efforts.

## 12.7 TECHNICAL TERMS

### **Green marketing-**

"Green marketing" represents an environmentally responsible approach applied to products and services, benefiting both consumers and the environment. It serves as both a promotional campaign and an advocacy effort aimed at endorsing and disseminating exemplary practices for fostering an eco-friendly society.

### **Corporate social responsibility**

Corporate Social Responsibility (CSR) is a concept and business practice that involves a company or organization taking responsibility for its social, environmental, and ethical impacts beyond its financial performance and legal obligations. CSR reflects a commitment to conducting business in a way that benefits society and contributes positively to sustainable development.

### **Green washing**

Green washing is a concept within green marketing that involves companies misleading consumers, government bodies, and investors by falsely presenting their products or services as environmentally friendly when, in reality, they are not. It is a deceptive practice that can harm consumers and the environment by promoting products as eco-friendly when they are not.

## 12.8 SELF-ASSESSMENT QUESTIONS

1. Explain the concept of Green marketing?
2. What the difference between Green marketing and corporate social responsibility
3. Write a critique on Green marketing
4. Discuss the role of brands towards environmental sustainability?

**12.9 SUGGESTED READINGS**

1. Antil, J. H. (1984). Green marketing: A look at environmentalism and consumption. *The Journal of Marketing*, 46(3), 158-170.
2. Henion, K. E., & Kinnear, T. C. (1976). A provisional typology for classifying the benefits people seek from leisure. *The Journal of Leisure Research*, 8(1), 33-43.
3. Mishra, P., & Sharma, P. (2010). Green marketing in India: Emerging opportunities and challenges. *Journal of Engineering, Science and Management Education*, 3(1), 9-14.
4. Polonsky, Jay M. (1994). *An Introduction to Green Marketing*. Retrieved 8 August 2022, from <https://escholarship.org/content/qt49n325b7/qt49n325b7.pdf>

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# LESSON 13

## SCIENCE COMMUNICATION DEFINITION AND SCOPE

### OBJECTIVES

1. Define science communication
2. Enumerate the Scientific Groups and Science Jahtas
3. Understand the Science and Technology Policy -2003
4. Acquire knowledge about scientific awareness programme

### Structure

- 13.1 Introduction**
- 13.2 Definitions**
- 13.3 Science Communication**
- 13.4 Scientific Groups and Science Jahtas**
- 13.5 Science and Technology Policy -2003**
- 13.6 The Year of Scientific Awareness -2004**
- 13.7 Summary**
- 13.8 Technical Terms**
- 13.9 Self-Assessment Questions**
- 13.10 Suggested Readings**

### 13.1 INTRODUCTION

Science Communication means ‘communicating science and building bridges between the people involved in scientific research and different groups of the public’. But Science Communication is much more than just communicating science. Science Communication is involved in developing government science policies, understanding relationships between ‘the public’ and ‘scientists’, and creating science stories in the mass media, as well as exploring how people learn about and engage with science.

### 13.2 DEFINITIONS

#### Science

Defining sciences is not an easy task. According to Webster’s New Collegiate Dictionary, the definition of science is ‘knowledge attained through study or practice,’ or ‘knowledge covering general truths of the operation of general laws, especially as obtained and tested through scientific method concerning the physical world.’ It simply means that science refers to a system of acquiring authentic knowledge. This system uses observation and experimentation to describe and explain natural phenomena. The panel on Public Affairs of the American Physical Society, for example proposed a definition that some describe as pure science: “Science is the systematic enterprise of gathering knowledge about the world and organising and condensing that knowledge into testable laws and theories” (Burns, O’Connor and Stocklmayer, 2003).

#### Communication

“Communication (together with its twin ‘information’) is perhaps one of the most loosely defined in contemporary media and cultural studies. It is because the term encompasses a multitude of experiences, actions and events, as well as a whole variety of happenings and meanings, and technologies (Kumar, 2010: 1). Dr. McFarland defined communication as a process of meaningful interactions by which meanings are perceived, and understandings are reached among human beings (Mishra and Singha, 2008:5).

Similarly, M.T. Myers and G.E. Myers defined that communication is ‘a special kind of patterning which is express in a symbolic form. For any communication to take place between or among people two requirements must be met namely, (a) a symbolic system must be shared by the people involved (we need to speak the same language or jargon or dialect, and (b) the associations between the symbols and their referents must be shared’. In nutshell, communication is described as an act of transmission of ideas, thoughts, beliefs, knowledge and opinion, etc. (Kumar, 2010).

### 13.3 SCIENCE COMMUNICATION

In loosely defined terms, Science Communication (SciCom) refers to a public media presenting science related topics to non-scientists and non-scientific communities. It is the processes by which the scientific culture and its knowledge are incorporated into the common culture (Bryant, 2004:1). Likewise, Schirato and Yell (1997) propose SciCom as “....the practice of producing and negotiating meanings, a practice which always takes place under specific social, cultural and political conditions.” It involves use of appropriate skills, media, activities, and dialogue to produce one or more of the following personal responses to science: Awareness, enjoyment, interests, opinion forming, and understating (Burns et al.2003).

‘Science communication’ will be defined as ‘the process of translating complex science into language and concepts that are engaging and understandable to non-scientific audiences such as politicians, industry professionals, journalists, government, educators, business, and the lay public’ (Burns,O’Connor, &Stocklmayer, 2003).

SciCom includes ‘pure science’, mathematics, statistics, engineering, technology, medicine, and related field. Science communicators are those who bridge the communication gap between the complex scientific world and the simple information requirements of stakeholders or the masses. According to Burns et al, science communicators require appropriated skills, media activities, and dialogue to produce one or more of the following personal responses (the vowel analogy):

- Awareness, including familiarity with new aspects of science
- Enjoyment or other affective responses, e.g. appreciating science as entertainment or art.
- Interest, as evidenced by voluntary involvement with science or its communication.
- Opinions, the forming, reforming, or confirming of science-related attitudes.
- Understanding of science, its content, process, and social factors, etc.

#### Science journalism

The art of communicating truth behind the crude science for information of the public through print and online media platforms is called science journalism. It is an important tool to inform the public on the results of research.

### **Science magazine**

The National Institute of Science Communication (NISCOM) previously the Publication and Information Directorate – also began publishing of the monthly Hindi magazine *Vigyan Pragat* in 1952. It envisaged as a newsletter disseminating information on scientific research activities and subsequently converted into a popular science magazine to inculcate scientific temper among the common people, helping them to ward off traditional beliefs. *The Science Reporter* (English monthly) and *Science Ki Dunia* (an Urdu quarterly) followed thereafter (Patariya, 2002).

## **13.4 SCIENTIFIC GROUPS AND SCIENCE JAHTAS**

At the same time, as an effect of the sudden accessibility of scientific knowledge to all social classes, small local groups of science writers and people involved in activities for the diffusion of scientific culture began to form. The first group to be established was the Kerala Sastra Sahitya Parishad (KSSP) and over the years it went on to become one of the largest and most active associations in this field. The People's Science Movement (PSM) was founded in the Nineteen Eighties, later changing its name to the All India People's Science Network (AIPSN), consisting namely of a committee for the co-ordination of the numerous local and regional non-governmental organisations (NGOs) set up over the years. It is this very People's Science Movement that led to the creation of one of the most extensive science communication events in the world. In the Nineteen Sixties, the KSSP devised a new way of involving the masses: Science Jahtas. The Jahtas were small groups of artists, scientists, teachers, students and unemployed youths, travelling from village to village in a kind of procession, staging proper theatre shows at every stop, accompanied by songs and puppet shows, supported by the distribution of explanatory leaflets. These Jahtas quickly became events that village inhabitants looked forward to, and for which they regularly organised a welcome. On the 2nd of October 1987, with the partial economic support of the Indian government, the People's Science Movement set up an event of incomparable dimensions: five different processions, comprising thousands of volunteers, covering 5,000 kilometres in 37 days, staging shows lasting several hours in the villages of the major Indian districts and ending in a great finale in the city of Bhopal, on occasion of the anniversary of the 1984 toxic gas leak that caused hundreds of victims. An estimated one third of India's population attended shows on themes linked to the prevention of diseases, the production of drinking water, the recommended behaviour in the event of climatic catastrophes, biodiversity and many other issues. A similar event was repeated in 1992, and today more than fifty Indian nongovernmental associations dealing - among other things - with the diffusion of scientific knowledge continue their work also thanks to the Jahtas.

### **1. NCSTC**

On an institutional level, science communication in India boasts a very advanced level of diffusion and structuring. Declared since the era of Jawaharlal Nehru - Gandhi's right-hand man who was the first prime minister of independent India (the state set up following the British retreat) in 1947 - the need to diffuse scientific knowledge to the entire population was quickly transformed into one of the most heartfelt needs of the country. While on the one hand a large number of local associations were set up and structured, busy spreading

knowledge directly among the people and attempting to popularise scientific literature through books, the radio and newspapers, the National Council for Science and Technology Communication (NCSTC), the main organ of government designed to diffuse science, was officially established in 1982. Its story is told by Manoj Patairiya, a scientist and member of the NCSTC since 1991 with many years' experience as a journalist and scientific writer. "Jawaharlal Nehru was indeed the first to understand how important the diffusion of scientific knowledge is, and he introduced a special provision into the Indian constitution, to make it clear that it was every citizen's duty to adopt 'scientific temper, humanism and spirit of enquiry'. Creating scientific awareness and developing a 'scientific temper' does not merely entail the diffusion of science. It means giving people the tools to develop an ability to think in line with the scientific method, and which is as logical and rational as possible. All NCSTC's efforts - and those of many other organisations set up over the years - are made with this in mind". It is difficult to list all the activities carried out by the NCSTC, or even those in which it participates. The Council has offices and delegations in all of India's 35 states and territories, where activities are carried out and run in 18 different languages, and it has also set up the NCSTC-Network, which groups together around one hundred organisations, the majority of which non-government run.

The science communication programmes run by the local departments reach most of the Indian Territory, and the NCSTC also offers direct training for expert communicators specialising in various areas of the sector.

The major large-scale events organised by the Council include the National Science Day programmes (a day, a week, or sometimes even an entire month of the year dedicated to an intensive range of science communication activities) and the National Children's Science Congress, which took place for the first time in 1993 and, once a year, gathers over one hundred thousand children aged between 10 and 17 from all over the country and is dedicated to hands-on learning. Last but not least, the NCSTC also produces popular educational material, often organised in kits distributed directly to village populations, as well as articles or series for the local media (television, radio and newspapers), for the most part dedicated to themes relating to health and prevention. The Council publishes a newsletter every month, in both Hindi and English, entitled NCSTC Communications, and collaborates in the running of over 200 university science communication courses throughout the country. According to Manoj Patairiya, "for some time now, we have also organised a section dedicated to research, because we are convinced that this is a fundamental area to improve our work". One of the most important studies carried out by the NCSTC concerns the overall public expectations on the methods and means of science communication.

Some estimates show that science currently obtains 3% of the total coverage by the Indian mass media. "Obviously, we hope to increase that percentage value over the next few years. But it is also important to do this in the right way: that's why we asked people what they expected from journalists and communicators", explains Patairiya. The survey results, published in an article in the Indian Journal of Science Communication (a science communication research magazine published twice a year, thanks to the Indian Science Communication Society, a nongovernmental association of professional science communicators set up in 1994), provided some important food for thought. More than 12% of interviewees, in a sample of 500 people, said they were interested in scientific issues. The major discrepancies between supply and demand of scientific communication were found in the means used to convey this information (diminishing interest in printed matter, greater demand for televised or popular products, such as street theatre or puppet shows), in the format (high demand for fiction programmes and shows in general rather than books or newspapers), and in the target, which according to interviewees should be most of all women,

children, students and farmers, for whom specific forms of communication should be devised.

The future of science communication is also a topic of conversation among journalists, scientists and communicators belonging to the numerous associations operating in this sector. These include the Indian Science Writers' Association, which groups together a large number of people committed to improving the public understanding of science. Yash Pal, one of the most important scientists continuously striving to diffuse science, says: "it is true that a lot is done to promote scientific knowledge in our country, but it is not enough. The "scientific awareness" spreading process must take place first and foremost by contextualising the data and knowledge into the needs of everyday life. The Children Science Congress has taught me what it means to tell people something starting from their daily experiences".

## **2. Vigyan Prasar**

Vigyan Prasar is another independent association, which was set up in 1989 thanks to the Indian government's Department of science and technology, and it is among the most active organisations in the production of material for science communication, as well as a meeting point and centre of coordination for scientific research institutes, schools, universities, museums and academies. In addition to the various books it has published for both adults and children, Vigyan Prasar also has an on-line publication called ComCom, a monthly science communication magazine (which provided extensive coverage of the tsunami last December and of the failure of science communication this natural disaster represented), and World of Science, namely archives of explanations of the meaning of the most important scientific terms. The association is also part of the network of Ham Radio, a world-wide circuit of radio lovers who build their own radio set (and tell anyone who wants to take part how to do so) and who discuss themes linked to science and technology. Moreover, the association publishes a newsletter once a month, distributed with many local newspapers and magazines, that goes by the name of Dream 2047, and VIPRIS, a compilation of the major scientific news announced in the international media over the fortnight prior to the date of publication, in English and in Hindi, as well as co-ordinating VIPNET, i.e. the VIGyanPrasarNETwork, since 1998. VIPNET groups together over 2,000 clubs and associations dotted all around India, and dedicated to the diffusion of science.

## **3. NCSC**

The National Centre for Science Communicators (NCSC), - which was founded in 1997 – is responsible for creating the National Directory of Science-Communicating Organisations, Governmental Organisations (GOs) and non-Governmental Organisations (NGOs), organising a large convention on science communication every year and promoting investigative science reporting. A. P. Deshpande, chairman of the NCSC, states the following: "what emerges from our meetings and from our discussions is that journalists should concentrate on researching local stories, diffusing scientific knowledge linked to people's traditions and investigating the major problems affecting the country, rather than simply translating the great stories of the Western press".

## **4. NCSM**

The list of activities and initiatives linked to science communication in India could go on almost endlessly. The National Council of Science Museums (NCSM), established over 25 years ago, coordinates the various regional centres dotted around the country, 28 museums and science centres, as well as organising travelling exhibitions, educational activities for



schools and public communication events. The majority of public and private medical and scientific research institutes is busy popularising its activities, and often publishes periodical newsletters or small information pamphlets. Television series and radio programmes of a medical and scientific nature are also frequently broadcast. One of the main radio stations engaged in this sector is All India Radio (AIR Delhi), which reaches 99% of India's population, broadcasting in 24 languages and 246 different dialects thanks to over 200 local offices, and which airs daily news reports on science as well as various programmes including Radioscope, Science Today and Science Magazine. One historical example of a television series with a scientific theme is Bharat Ki Chhap (The Identity of India), produced in 1989, and later translated and broadcast in other languages apart from Hindi, based on the history of the development of science and technology in India. Lastly, there are a number of programmes entirely dedicated to interaction with the public, where experts answer listeners' questions on the air (such as Kyon Aur Kaise?, produced by the NCSTC), or with quizzes (such as Kudaratnama, co-produced by the NCSTC).

## 5. NISTADS

The National Institute of Science, Technology and Development Studies (NISTADS, part of the Council of Scientific and Industrial Research (CSIR)), an institute dedicated completely to research in the field of Public Attitudes and Understanding of Science (PAUS), was set up in 1989. Over the years, the NISTADS has carried out several research projects on the relationship between science and society in India, concentrating especially on themes such as sustainable development, technological innovation, and the cultural distance separating rural areas of the population from scientific knowledge. The NISTADS has an interdisciplinary structure, and currently consists of 45 researchers, of which more than two thirds are graduates of scientific faculties, and the remainder have a degree in arts-related or social subjects. In addition to its research activities, the institute publishes the Current Literature on Science of Science, a bimonthly review of the major international magazines dedicated to Science and Technology Studies.

## 6. Research Institutes and Universities

“Scientific research in India is also making huge progress”, says Narender K. Sehgal, physicist and journalist, winner of UNESCO's Kalinga Prize for Science Popularization in 1991, “there are currently more than 100 research institutes and over 150 university centres throughout India, and the number of private centres dedicated to research and development is also on the rise. The ratio between public and private is currently around 70 to 30, but the government hopes to balance it out to 50/50, although I believe the levels of funding in both sectors should double to reach international standards. In the meantime, scientific productivity in India is growing considerably, and the figures are definitely promising”.

### 13.5 SCIENCE AND TECHNOLOGY POLICY -2003

India's engagement in scientific research and diffusion is sanctioned by the Science and Technology Policy 2003, a declaration of intent signed by the Indian government that lists the future strategies and objectives aiming to reduce the gap between India and the richest countries in the world. Apart from dealing with the economic aspects and the importance of co-operation on a national and international scale, various parts of the document highlight the importance of the development of Public Awareness of Science and Technology, a conveying of knowledge aiming to “reawaken” the “scientific temper” of every inhabitant of the country. India, the seventh largest country in the world, has over one

billion inhabitants (one sixth of the world's population), who speak more than 1,600 different languages and dialects, the most common being Hindi and, until recently, English. Apart from the problems linked to overpopulation and the shortage of food resources, due to the recent and often disorderly industrial development, the country is now also facing serious problems linked to environmental deterioration, which make incidents of deforestation, desertification and water and atmospheric pollution all the more worrying. In the country's rural areas (the sustenance of two thirds of the population is based on farming), the lack of basic skills, combined with widespread superstitious beliefs, still causes the diffusion of fatal diseases, malnutrition and poverty today.

### **13.6 THE YEAR OF SCIENTIFIC AWARENESS -2004**

The Year of Scientific Awareness (2004) saw the renewed engagement on the part of the NCSTC and various non-governmental organisations in an attempt to involve the country's entire population. For the first time, the classic use of jahtas was supported by a travelling exhibition, the Vigyan Rail Science Exhibition on Wheels, mounted on a train, which travelled to a very large number of villages located along the railway lines. But most of all, many of the activities relied upon "need-based" programmes, i.e. programmes built especially according to the needs and problems of each individual region, while a decentralised organisation spurred the involvement of the local communities. Patairiya reports: "There is still a lot to be done to fight the superstitions and religious rituals that are so deeply rooted into villagers' lives. Sometimes we don't have sufficient infrastructures to make our message effective enough, and people continue to trust witch doctors more than real doctors".

There was no shortage of criticism for this type of event either. Many scientists and communicators have complained about the dangers of a science communication based solely on the "deficit model", which is covered exclusively through educational activities. Manoj Patairiya, who actively took part in organising the YSA, concludes: "I believe it is very important that in every initiative communication be developed on two levels of knowledge-sharing. One level concerns knowledge conveyed to the population by experts, and the other concerns traditions and popular customs handed down from generation to generation in villages for centuries, and a symbol of sustainable development that should become part of the country's cultural heritage".

Although India features so much interest and offers so many initiatives and activities dedicated to science communication, and many institutions have been engaged for many years in studies and considerations on the tools and methods required to improve its effectiveness, there is considerable criticism in various parts of the country, from journalists and scientists alike.

India is turning into a new power in terms of technological research and development, as declared in a recent issue of the British New Scientist, which defines India as "the next knowledge superpower". And yet too large a portion of the population still suffers from malnutrition, does not have the appropriate means of sustenance through farming, while over 6 million people in India have contracted the HIV virus.

### **13.7 SUMMARY**

In the field of scientific research, some criticism arose concerning both the economic aspect and the destination of funds. The country currently allocates approximately 1% of its gross domestic product to research and development (R&D), to reach 2% in the next two

years. Nonetheless, a large portion of funds is invested in sectors defined as “secret science”, including the military, defence, atomic energy and aerospace research. These are sectors where journalists often have difficulty accessing information, and where communication is complicated by some heavy red tape. In the meantime, biomedical studies are affected by a chronic shortage of funds, causing backwardness compared to other countries in the world. The new government’s challenge will therefore also have to involve the offices of the Department of Science and Technology (DST), and the co-ordination of all the institutions and associations engaged in scientific research. With regard to science communication, ideas, creativity and a new approach will all be vital. Gauhar Raza, a scientist and researcher at the NISTADS, explains “the majority of science communication activities currently carried out at an institutional level and through the mass media is based on Tran’s missive, deficit models. As we aim to establish direct contact with the people – villagers for example - it is fundamental to consider the fact that we cannot ignore the ‘cultural distance’ that lies between their everyday experiences and the knowledge we want to convey. Communication is a cultural process, a movement that has to be able to shift in several directions and in different ways”.

### **13.8 TECHNICAL TERMS**

#### **Science Communication (Sci Com):**

It refers to a public media presenting science related topics to non-scientists and non-scientific communities.

#### **Science Journalism:**

The art of communicating truth behind the crude science for information of the public through print and online media platforms.

**NISCOM:** The National Institute of Science Communication.

#### **KSSP:**

Kerala Sastra Sahitya Parishad

#### **PSM:**

The People’s Science Movement

#### **AIPSN:**

All India People’s Science Network

#### **NCSTC:**

National Council for Science and Technology Communication

#### **VIPNET:**

Vigyan Prasar NET work

#### **NCSC:**

The National Centre for Science Communicators

**NCSM:**

The National Council of Science Museums

**NISTADS**

The National Institute of Science Technology and Development Studies,

**CSIR:**

Council of Scientific and Industrial Research

**DST:**

Department of Science and Technology

**13.9 SELF-ASSESSMENT QUESTIONS**

1. Define science communication and explain in detailed.
2. Explain the role of scientific organizations on the dissemination of science

**13.10 SUGGESTED READING**

1. Marzia Mazzonetto (2005) Science communication in India: current situation, history and future developments, Journal of Science Communication JCOM 4 (1), March 2005

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## LESSON 14

# HISTORY OF SCIENCE COMMUNICATION

### OBJECTIVES

1. Understand the history of science communication in India
2. Enumerate the present perspectives science communication
3. Understand the emerging perspectives science communication
4. Acquire knowledge about Investigative Science Journalism

### Structure

- 14.1 Introduction**
- 14.2 Historical Perspective**
- 14.3 Present Perspective**
  - 14.3.1 Science Journalism and Mass Media
  - 14.3.2 Trends in Science Writing/ Reporting
  - 14.3.3 Reporting on Local Issues of Scientific Importance
  - 14.3.4 Investigative Science Journalism
  - 14.3.5 Science Journalism and Scientific Literacy
  - 14.3.6 Creating the Creators
  - 14.3.7 Creating the Creators
- 14.4 Emerging Perspective**
- 14.5 Summary**
- 14.6 Technical Terms**
- 14.7 Self-Assessment Questions**
- 14.8 Suggested Readings**

### 14.1 INTRODUCTION

Science journalism is the key to the real treasure of the scientific knowledge, by virtue of which scientific knowledge and concepts could be carried to the common man. Thus the common man is benefited with the new advancements in science and technology and is able to fight against hunger, drought, diseases, and social evils, like superstitions, etc., with self-confidence, courage and faith. Being aware of this fact, science journalism in India has yet to come out of its present stage of infancy.

Undoubtedly, science and technology journalism has progressively developed in India, in terms of quality and quantity, but still there are many miles to go to achieve the desired level. Science journalism, during its almost two centuries long journey thence has crossed several milestones. There has been a considerable progress in science journalism over the years and as a result several science magazines, feature services, programmes on radio and television, etc., emerged, despite the fact that they came into existence much later. The plight of science journalism in India may not be too deplorable at the moment, however, a good deal still remains to be done in this field.

### 14.2 HISTORICAL PERSPECTIVE

During early days, there was no science communication or journalism, as such. But as we understand it today, the technology, science and communication existed from the very

beginning. There had been a number of turning points during the cultural evolution of man in Indian subcontinent, from where we can mark the beginning of science communication, but it is very difficult to pin point a single incident being origin of science communication in the country. The earliest origin point of science communication can be marked, when early man had made primitive stone tools and disseminated them, sometime during 1,50,000 years ago or earlier in the Shivalik region of the subcontinent. Then came the use and control of fire and dissemination of fire kindling technology. Preparation of cave sketches/ drawings was the next step. Cro-Magnon man lived in the Indian sub-continent, who prepared cave sketches, did experiments and prepared records some 40,000 years ago (Exhibition on History of Science and Technology in India, 1998, NCSTC). These can be considered as the early modes of science dissemination.

The early man might have communicated with each other through body language. Subsequently, oral language, phonetic and written language evolved, which were followed by well-developed *Prakruta* language and then various regional languages found their ways to flourish. Indus valley civilization flourished in Indian subcontinent, besides its well-developed Indus script. Agricultural communication started through public relations around 10000 years ago, when man started exchanging information about various agricultural practices, like sowing, irrigation and harvesting, etc.

India has a rich tradition of communication, especially when it comes to masses. Folk arts, like *Nautanki*, *Ramlila*, folk songs and folk dances are immensely effective as the means of mass communication. India has a great tradition and a treasure of scientific heritage. During Vedic, post Vedic and classical periods, a whole host of ancient scientific literature was created, although such information was not available to the public, and was limited to most privileged class only. The medieval period has been important for the preparation of a large number of commentaries on earlier and contemporary scientific works. This can be considered a great milestone on the road to communication, as the information about most of the ancient and classical works mainly reaches us only through these commentaries.

The scientific temper has always been in India, in the form of logic, reasoning and method of acquiring knowledge, throughout the cultural evolution of man. *The science communication* in its real term had begun with publication of a scientific journal, *Asiatic Researches*, quarterly from the Asiatic Society, Calcutta in 1788. Thereafter, the science communication in India has evolved in many facets. Following this, there has been a continuing development in the formation of scientific institutions and publication of scientific literature. Subsequently, scientific publications also started appearing in Indian languages by the end of eighteenth century. The publication of ancient scientific literature and textbooks at mass scale started in the beginning of nineteenth century. The scientific and technical terms, however, had been a great difficulty for a long time for popular science writing.

The beginnings of science journalism in Indian languages could be traced back to the articles published in the monthly *Digdarshan* from Srirampur (Hooghly), West Bengal in April 1888 in Hindi, Bengali and English. These articles dealt with topics like flying in a balloon, steam boat, etc. Other newspapers also started giving scientific information. Science communication activities could not develop sufficiently during nineteenth century; however, a number of publications were brought out in different Indian languages and on various scientific subjects. The science communication was mainly limited to publication of books and scientific journals, except a few popular science articles on latest developments.

In the beginning of the twentieth century, new trends emerged. Science congresses, scientific and industrial exhibitions, seminars, industrial and technological museums, public lectures, popular science magazines, etc. were few among the newer developments towards science communication. But the pace of these activities remained low and no significant effort was done to popularise science among the people and inculcate a scientific temper amongst them. The same pattern more or less continued till independence.

### 14.3 PRESENT PERSPECTIVE

After Independence, science popularization was being taken up at various levels. The Scientific Policy Resolution of March 4, 1958 has been a guiding factor for development of science and technology in the country. It was the first Prime Minister of India, Pt. Jawahar Lal Nehru, who gave an impetus to scientific pursuits and development of scientific outlook. The independent India witnessed a rapid growth in the efforts of science communication and popularization. With a view to integrate, coordinate, catalyse and support the efforts of science communication and science popularization in the country, the Government of India established the National Council for Science and Technology Communication (NCSTC) in 1982 as an apex body, which puts more concerted efforts in this direction.

A number of programmes and activities have started in public and private sectors to spread scientific knowledge and scientific outlook among masses, especially in vernaculars, but science journalism in its real form could not evolve and remained an inner page affair for the media, except a few occasions, such as Apollo Expedition (1969), Total Solar Eclipse (1995), Ganesh Drinking Milk (1995), and Nuclear Tests (1998), etc. Following are some of the dimensions of the state of science journalism in India:

#### 14.3.1 Science Journalism and Mass Media

We have been using various means and modes for science journalism/ communication, as follows:

**a) Print Media:** Such as a newspaper, magazines, wallpapers, books, posters, folders, booklets.

**b) Audio/Visual Media:** Mainly radio and TV, besides, films, slide shows, bioscope.

**c) Folk Media:** It has been a common observation, that through folk media, it is possible to achieve penetration to the segments where other media have limitations. Puppet shows, street plays skits, stage performances, folk songs and folk dances, *Nautanki* and other traditional means of communication belong to this category. This media is cost effective, entertaining and offers two-way communication.

**d) Interactive Media:** Science exhibitions, science fairs, seminars, workshops, lectures, scientific tours, conferences, *Vigyan Jathas*, etc. The advantage here is man-to-man and two-way communication.

**e) Digital Media:** information technology has given birth to comparatively a new media, known as digital media. It includes Internet, CD-ROM, multimedia, simulations, etc. It has also made science communication simpler to handicapped segments of the society.

That apart, we are popularizing science through our 18 regional languages, to penetrate into local populace effectively. Selection of target audience has greatest significance. Our science communication efforts are aimed at various target groups, such as, common man, children, students, farmers, women, workers or specialists, etc. Various forms for presentation are being used to making science communication more interesting and enjoyable, such as science

news, report, article, feature, story, play, poem, interview, discussion, lecture, documentary, docu-drama, scientoon (science +cartoon), satire, etc.

Today there are popular science magazines in almost every Indian language, barring a few. Science programmes appear on radio and TV. Online popular science magazines, science news on Tele text, ready-to-print science page are some of the new developments in the area of science journalism.

The use of broadcast and digital media has opened new vistas of science journalism. The revolution in information technology has made possible to get scientific information from around the globe within seconds, on our fingertips. More concerted, coordinated and integrated efforts have started to cater to large and all cross-sections of the society.

### 14.3.2 Trends in Science Writing/ Reporting

Science articles published in the newspapers/ magazines today are not too different from what they used to be years ago, i.e. with prosaic style, technical jargon and excess of avoidable statistics. Obviously, complicated and uninteresting articles lacking in liveliness, lucidity and without a continuous flow cannot be expected to attract a large readership. Occasionally, the articles are immersing from the point of view of subject matter but lacking in presentation. Due to phenomenal technical advances and narrow specialization in various fields today both authors and editors alike, find themselves at bay while dealing with a particular scientific/ technical topic. The articles in Indian languages often are mere translations of the original English ones. It is necessary to encourage original science writing in Indian languages.

Then, how should a science article be like!? In the age of technological advancement today, most people prefer article which are informative, analytical, and critical and having a continuous flow. To write an article on a particular topic, one needs to read and understand the available literature and discuss the topic with concerned experts and incorporate their suggestions. Necessary statistics, diagrams, photographs, etc. also need to be collected. It is necessary to bear in mind that an integrated and balanced view of the topic/ issue needs to be presented along with a proper analysis in a language easily intelligible to the common public. An article must necessarily reflect alertness and the investigative bent of mind of the reporter. Undoubtedly, even the laymen appreciate such articles and reports. Needless to say, the titles and sub-titles need to be interesting and eye catching - nobody likes dry and unattractive titles.

Sharma K (1993) has commented on popular Hindi science magazines - "most of the popular science magazines are depending upon translations that create a lot of distortion in the presentation." He also rightly commented on science writers- "they tend to prepare a story or a report only sitting inside the room, without going outside or interacting with scientists, who are associated with the story, or covering on-the-spot events."

Not only in print, but in broadcast media also, the misleading scientific information, a continuous decay of creativity in presentation, distortion in translation, inconsistency in organizing the contents, lapses in the use of language, and many more deviations can be seen frequently.

Singh (1993) contends - "that popular science writing in India is still shackled by complacency and over dependence on foreign sources, they are unfortunately used for plagiarism".

Very often, it has been seen that a writer uses the popular article of another writer as a source for his writing and subsequently a third writer is using his article and a chain of



substandard articles is formed, without consulting the primary source. Thus a series of such distorted communications appear in the media, as if it were original science writing. In case of translations, other writers generally misinterpret the technical terms, especially in their subsequent versions.

Usage of technical terms could occasionally give rise to difficulties, and hence it is advisable to select and explain explicitly various terms used. For example, in an article published in a Hindi newspaper, "Satellite DNA" was referred to as "Upagraha DNA", where it should have read "Vahak DNA". Usage of improper technical terms would hence need to be given due attention by the science journalists. Terminologies on all technical subjects in regional languages are available today, however, the usage of a particular term would require the proper judgement and discretion on the part of the author or the editor.

Science dissemination is not limited to newspapers and magazines alone. We have a host of publications on scientific topics that include science books at popular levels, feature services, encyclopaedias, reference books, monographs, technical reports, special reports, souvenirs, annual reports and more. A common thread that needs to run through all these different types is the authenticity and simplicity and at the same time, a presentation that is acceptable and readable.

*Nav Bharat Times*, a leading Hindi daily, started a science column in the year 1948. Today, unfortunately, in most of the dailies, weeklies and monthlies, we do not see much coverage of science and technology. It is desirable and imperative to introduce science columns in newspapers/ magazines. A few newspapers, however, cover science/ technology news and also have introduced regular science columns. But, in a country like ours, where not many people are exposed to the basic principles of science and technology, this, by itself, is not sufficient. Rarely, a science editor or a science reporter is associated with a newspaper or a magazine. It is desirable to have science correspondents with all newspapers. This would, in due course, help evolve a policy on editing and reporting of contemporary topics on science and technology in different modes of presentation in the media.

One of the reasons for the science reporting to have remained underdeveloped in our country may be due to the fact that except for a few dry and drab articles, technical information/ news, and hardly any other modes of science writing were employed. May be this is why common man could not come to terms with science and technology. If science were presented in the form of stories, poems, etc, common man not only would be able to read, but, also would understand and appreciate science. Poetry is a powerful medium for communication, which could be used for communicating science to children and neo-literates. Explaining science in the form of poetry is not as difficult as it may seem. Science dramas and skits are also under-utilized. Only rarely one comes across science drama and skit in print medium.

Upcoming science writers need to give a try to communicating science through these unconventional modes. Humour and satire are other areas still untreated in science reporting. In fact, these modes have not been exploited in science communication at all! Newspapers/ magazines do publish debates on political and social issues, but rarely a science reporter or an editor has shown interest in publishing debates on any scientific issue. Today, there exist several possibilities of publishing debates on a current issues based on interviews with scientists and articles based on the same. Apparently, the readers show a keen interest in scientific topics if presented in such an exciting manner. The use of the various modes in science reporting would not only generate an interest in science but would also inculcate scientific attitude into them.

### 14.3.4 Reporting on Local Issues of Scientific Importance

Often, local scientific/ technological issues do not find a place in mass media at state or national levels. It is worth noting that there has been considerable success in addressing local issues/ problems/ technologies through local/ regional level science journalism, which could even help in adopting/ transferring traditional technologies/ processes prevalent in one part of the country to other parts. A few examples are noteworthy. In a workshop on science writing/ journalism at Rampur, U.P., a group of participants discovered during the course of preparation of their story as an exercise of on the spot reporting that untreated effluents from Kashipur and nearby industries were being discharged in the Kosi River. Animals died as a result of drinking the polluted water of the river. Even trees and plants did not survive. Moreover, the ingress of polluted river water in the wells of the nearby 60 villages rendered the water undrinkable. This group of reporters made a thorough investigation of this problem during the course of the workshop. Specimens of polluted water were collected and analysed. When the reports appeared in media, the authorities were alarmed and forced to take a number of steps at different levels to solve the problem. This is how such local level science journalists can help bring to the fore the local issues/ problems and help address/ solve the same.

Here is yet another example. During the course of a workshop in Himachal Pradesh, a group of writers/ journalists came across a traditional technique for storage of water (Khatriyan in the local language). Often, tanks for storing rainwater are constructed under the houses, sometimes in an open area. Rainwater collected from the roofs of the houses is collected through pipes in these tanks. In case it snows in the area, after the snowfall, the water gets collected when the snow melts. This stored water is used for doing a variety of jobs for the whole year. This technique was being used in the past in some other parts of the country as well and it still could be used. Surely, such traditional technologies existed/ are existing in different parts of the country. As a matter of fact, indigenous techniques/ technologies were develop/ are developed depending on need arising from time to time, or were modified/ improved upon for better efficiency and utility. The practitioners in science journalism could report on these aspects as well.

### 14.3.5 Investigative Science Journalism

The scientific writing in our country today is chiefly limited to describing various aspects of a particular topic, either in a descriptive manner or in praise of it. A large number of our science writers and scientific journals are from the public sector and hence it is difficult to expect them to be analytical or self-critical. Further most of the R&D in our country is being carried out in government laboratories and there is hardly any means for the common people to know what scientists are doing. To bring public awareness in our country in the field of research, there is a need for investigative journalism in this field. Whatever is happening in this field, good or bad, proper or improper must be brought before the people, only then science journalism in our country would flourish in its complete form.

Science journalism in India is nearly devoid of any investigative journalism. This form of journalism is attractive in its own way and retains readers' interest in the article to read further. Normally, a journalist publishes an article after a thorough investigation on political, social, or an economic issue. This aspect, however, is largely absent in the case of scientific topics. Perhaps, scientific issues are considered as being free of any human weaknesses, or not important enough to deserve investigative reporting!

The various forms of science journalism become clear only when aspects like proper or improper uses of science and technology and good or bad impact of the same on society are brought to the fore. Science reporting then will develop into a form of an alert guard and adviser, say, the case of introduction of new technology, genetically modified food, CNG fuel, and so on. This could become possible only when an enthusiastic science journalist/reporter take science journalism as a profession. Such reporters could visit a scientific laboratory and interact with scientists in order to know the current scientific research and developmental work going on and bring it to the people. It is necessary to realize that investigative journalism does not imply investigation of any irregularity alone in a laboratory/organization, but bringing to the people those useful technologies also still not known far and wide.

### **14.3.6 Science Journalism and Scientific Literacy**

Scientific literacy is necessary for the economic and healthy wellbeing of the social fabric and every person, and for the exercise of participatory democracy. It also implies the ability to respond to the technical issues that pervade and influence our daily lives. It does not mean detailed knowledge of scientific principles, phenomena or technologies, however, it rather points out to the comprehension of what might be called the scientific approach, or the scientific way of conduct or the method of science. Science journalism keeps people aware about the latest in the field of research and development and helps them lead a life with better knowledge and understanding of newer advancements. The last two decades have been characterized by the rapid development of new scientific and technological advancements across a wide range of fields. Access to these advancements is distributed unevenly within the country. Even people in far-flung areas often lack access to not only traditional but also modern scientific knowledge. Effective localized science journalism can help enhance public awareness about science and technology confronting their day-to-day lives.

### **14.3.7 Creating the Creators**

In order to develop trained manpower in the area of science journalism/ writing/ communication, training/ educational programmes are being offered at various levels in our country: i) Short term courses, which are of 3 to 7 day's duration; the participants are science activists and enthusiasts, whether students of science at higher level or not; ii) Medium term courses, which are of two to four month's duration; usually for those who want to improve their science communication skills; and iii) Long term courses, which are of 1 to 2 year's duration; run at different universities/institutions and offer post graduate degrees or diplomas in science communication. Besides, a correspondence course in science journalism of one-year duration is also available.

As part of short-term courses, 3-5 days' training-cum-orientation workshops of local/ regional writers, journalists, illustrators are organized and they are exposed to various techniques of science writing, reporting, and illustrations. The idea behind this programme is to develop grass root science writers/ journalists who can eventually write on local issues of scientific importance with the help of locally available resources/ experts for the local/ regional level mass media. This is our way to enhancing science coverage in local/ regional press. Some 200 such workshops have been organized so far and our target is to have similar programmes at all the 500 districts. Through the implementation of this idea, a number of skilled science writers and journalists are coming to the fore from different regional

languages. At some places, these grass root science writers have formed Regional Science Writers' Associations as chapters of the Indian Science Writers' Association (ISWA).

#### 14.4 EMERGING PERSPECTIVE

In spite of a number of efforts for developing science journalism in India, there are certain challenges before us, to be met. Some of them are listed below:

- a. As an average, the science coverage in India is around 3%, which we intend to enhance up to 15%, as per a resolution of Indian Science Writers' Association.
- b. The number of capable science journalists/ writers and popular science magazines is alarmingly low and hardly sufficient to cater to the large target audience.
- c. The science has still not succeeded in attracting the media to the extent that it could appear on the front page or become a lead story, like the politics, films or sports. Mass media has its commercial compulsions, which superimpose all the science communication efforts and leave a negative impact in the minds of the audiences. Instead of including scientific information, they prefer to generate more revenue by including non-scientific, meta-scientific or occult information, etc.
- d. It is rather disappointing to note that leading science magazines have ceased their publication, like Science Today, Science Age, Bulletin of Sciences, Research and Industry, etc. and Indian editions of foreign science magazines, like Vigyan (Scientific American), World Scientist (La Recherche), etc. could not survive, however, recently Indian edition of Popular Science has been started from New Delhi.
- e. India has 18 recognized regional languages. Science writing in many languages is yet another great challenge, as scientific information is generally available in English. The quality of scientific translation could not achieve the level of excellence.
- f. The science writing is still dry and boring, and interesting styles of writing, like fiction, poetry, satires, skits, discussions, etc. have not found adequate space and time in the media. Even most of the science writers could not contribute sufficiently such an interesting science material. Merely occasional appearance of something in the name of science fiction cannot serve the purpose.
- g. Misleading scientific information, a continuous decay of creativity in presentation, distortion in translation, inconsistency in organizing the contents, lapses in the use of language, and many more deviations can be seen on media frequently.
- h. There has been emerging conflict between scientists and journalists, which is a great impediment towards the progress of science journalism in India. This can be resolved by way of organizing scientists-journalists meets on regular basis.
- i. As far as science writing and science journalism are concerned, there is ample scope for furthering such efforts in developing countries, especially in South Asian Region. A common science and technology news and features pool can be formed to facilitate writers/ journalists to get/ exchange information on scientific research.
- j. There is a great shortage of properly trained science writers, journalists, communicators, illustrators in various parts of the world, though, a number of training programmes are conducted at various places. Therefore, more training programmes are needed, which may preferably be conducted to give more opportunity to developing countries.
- k. Popular science writing in India is still shackled by complacency and over dependence on foreign sources. It is very difficult to get information from a scientific laboratory. The scientists in some organizations are not allowed to talk to the media

about the research being carried out by them or in their laboratory. This requires a science media centre, including a centralized website to facilitate media persons to get research reports well in time.

- l. All India Radio has started science news based on the research papers appearing in Indian research journals. Print media can follow similar practice as well.
- m. Following the industrial revolution in the western countries, the level of science coverage in mass media was exponentially increased. As such, India is passing through the same stage, in the present time. As the technology advances, the need of scientific information would also increase. Accordingly, the industrial India would soon witness the high time of science journalism, but the scientific community, media persons and public have to be vigilant enough to harness this opportunity.
- n. Generally, science journalism is misunderstood merely as communication of data; it must go beyond data. The logical and rational interpretation must come up to the fore, enabling the target audiences to shape their lives, ideas and thinking, as well.
- o. There is a need of debates in mass media on emerging issues of science and technology which are relevant to the people and are of their immediate concern to enable them to take informed decisions to lead their life in a democratic society.

Though, challenges are many, we could see some rays of hope, as India has been able to take initiatives in a number of newer programmes in the area of science communication, such as, Vigyan Jatha, Children's Science Congress, and Scientific Explanation of So-called miracles, etc., which were not tried out elsewhere and can take lead in these innovative areas of science communication to better serve the mankind.

## 14.5 SUMMARY

In order to identify and evaluate the present status of science journalism in India, various parameters were used. On the basis of a survey conducted, some interesting inferences were drawn. Near about 12.66% respondents were interested in science and technology coverage. This inference seems to be exactly in conformity with the desired level (10-15%) of science coverage in the country. While looking at the demand and supply analysis, the demand seems to be very less in some cases. This however, is a false situation limited by the necessary expansion, which may leap many times in near future.

Science certainly does not fare well when we talk of readers' interest but it is also true that we need to work in the direction of making science interesting. A lot more creativity is required in the field of science writing and journalism; perhaps this is what we lack at the moment. Science fiction has achieved the status of best sellers in the west, whereas we hardly have anything significant of this type of science writing. Low interest in sciences can be traced to another reason that we are not prioritising two important segments of our readers, the students and the farmers, in the manner that is of interest to them. There is reasonable interest in the folk media, especially in the rural areas and this media does not find enough attention vis-à-vis science journalism.

It is time to recognize the shift in target population's interest, i.e. towards television, and science programmes should be created in enough number through formats, which are most attractive to them. It may not be incorrect to say that docu-drama would be the most sought after format of science communication through television. When, India is passing through a crucial turning point of its development, we must take emerging trends into our

stride and redraw our policies and plans, to be a nation of scientifically thinking and scientifically informed people. Hence, the efforts directed towards enhancing science coverage in mass media through effective and creative science journalism need to be given more priority. This is an issue, which scientists, media persons and the public have to take seriously and other side of the coin needs to be focussed now.

#### **14.6 TECHNICAL TERMS**

**CNG:** Compressed natural gas

**Docu-drama:** Documentary with drama

**Sciencetoon:** science + cartoon

**ISWA:** Indian Science Writers' Association

#### **14.7 SELF-ASSESSMENT QUESTIONS**

1. Explain the history and present status of science communication in India?
2. Elucidate the present perspectives science communication?
3. Discusses the emerging perspectives science communication?

#### **14.8 Suggested Readings**

1. Satyaprakash, Bharatiya Vigyan KeKarnadhar, 1967, Research Institute of Ancient Scientific Studies. New Delhi.
2. Sharma Kuldeep, Kuchh Roti Kuchh Sisakati Vigyan Patrikyein, 1993. Hindustan, New Delhi.
3. Singh Ranbir, Are Most Science Writers Nearly Plagiarists, 1993, Pioneer, New Delhi.
4. Toynbee A, Mankind and Mother Earth - A Narrative History of World, 1967, Book Club Association, London.
5. Sharma RD, Botanical Science in Ancient India, 1993, Bhagirath Book Trust, Ghaziabad.
6. Sharma OP, Trends in Scientific Terminology, 1962, National Bureau of Educational Publications, New Delhi.
7. Vaidik VP, Hindi Patrakarita -Vividh Aayam, 1976, National Publication House, New Delhi.

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# LESSON 15

## SCIENCE COMMUNICATION AND IMPORTANCE

### OBJECTIVES

1. Understand the techniques Public Awareness and Engagement.
2. Enumerate Modalities to communicate science.
3. Understand the Need of Science Journalism
4. Acquire knowledge about the real life situations

### Structure

- 15.1 Introduction
- 15.2 Defining related terms
- 15.3 Public Awareness of Science (PAS)
- 15.4 Public Engagement with Science (PES).
- 15.5 Modalities to communicate science.
- 15.6 The eight steps are outlined in Science Communication Reconsidered
- 15.7 Need of Science Journalism
- 15.8 The importance and usefulness of the science Journalism
- 15.9 Some of the real life situations
- 15.10 Summary
- 15.11 Technical Terms
- 15.12 Self-Assessment Questions
- 15.13 Suggested Reading

### 15.1 INTRODUCTION

Science communication is not a simply encouraging scientist to talk more about their work, nor is it an offshoot of the discipline of communications. Although people may use the term “science communication” as a synonym for public awareness of science (PAS), public understanding of science (PUS), scientific culture (SC), or scientific literacy (SL)—in fact many of these terms are often used interchangeably—it should not be confused with these important and closely related terms.

### 15.2 DEFINING RELATED TERMS

To understand science communication, agreement needs to be reached about the meaning of some foundational terms.

#### The public

The simplest and most useful definition of the public is every person in society. It is acknowledged that “the public” is a very heterogeneous group; it is as multifaceted and unpredictable as the individuals that compose it. In fact at least six overlapping groups within society (sometimes known as “publics”), each with its own “needs, interests, attitudes and levels of knowledge” have been identified for the purposes of science communication activities and/or research. These are:

- “Scientists: in industry, the academic community and government.
- Mediators: communicators (including science communicators, journalists and other members of the media), educators, and opinion-makers.
- Decision-makers: policy makers in government, and scientific and learned institutions.
- General public: the three groups above, plus other sectors and interest groups. For example, school children and charity workers.
- Attentive public: the part of the general community already interested in (and reasonably well-informed about) science and scientific activities.”
- Interested public: is composed of people who are interested in but not necessarily well informed about science and technology. Two other terms are also commonly used:
- The “lay public” identifies people, including other scientists, who are non-expert in a particular field.<sup>5</sup>
- The “science community” or “science practitioners” are people who are directly involved in some aspect of the practice of science. Together these groups form “the public,” and the public together with its customs, norms, and social interactions constitute a society.

### **Participants**

Participants are not the same as stakeholders (people with a vested interest in a particular outcome) or clients (persons paying for a service), although they may also be these. In the context of participants are members of the public who are directly or indirectly involved in science communication. Examples of direct involvement include visiting a science centre, attending science theatre, or writing a letter to the editor of a newspaper on a science-related matter. The venue, sponsor, and promoter of a science communication event may be classified as indirect participants (but may still have a large impact on the success, or otherwise, of the actual event).

Participants are individuals who belong to the general public and may therefore specifically include scientists, science communicators, businesses and members of the media.

### **Science**

Defining science is notoriously difficult. The Panel on Public Affairs of the American Physical Society, for example, proposed a definition that some describe as pure science: “Science is the systematic enterprise of gathering knowledge about the world and organizing and condensing that knowledge into testable laws and theories.”

### **Communication**

Schirato and Yell (1997) define communication as “. . . the practice of producing and negotiating meanings, a practice which always takes place under specific social, cultural and political conditions.”

## **15.3 PUBLIC AWARENESS OF SCIENCE (PAS)**

Learning about science can occur in either formal or informal settings. Science education at primary, secondary, and tertiary institutions is the usual formal setting, while informal settings are commonly grouped under the label of either “public awareness of science” or “public understanding of science.”



Gilbert, Stocklmayer, and Garnett (1999) defined the public awareness of science (PAS) as a set of positive attitudes toward science (and technology) that are evidenced by a series of skills and behavioural intentions.

On occasions, the term “public awareness of science” has been used as a synonym for “public understanding of science.” Their aims are similar and their boundaries do overlap, but PAS is predominantly about attitudes toward science. PAS may be regarded as a prerequisite—in fact, a fundamental component—of PUS and scientific literacy.

### **Science communication: a contemporary definition**

It is apparent that, while the terms public awareness of science, public understanding of science, scientific literacy, and scientific culture should not be used interchangeably, considerable commonality does exist between them. They have broadly compatible aims but different philosophies, approaches and emphases. In essence:

- Public awareness of science aims to stimulate awareness of, and positive attitudes (or opinions) towards science.
- Public understanding of science, as the name suggests, focuses on understanding science: its content, processes, and social factors.
- Scientific literacy is the ideal situation where people are aware of, interested and involved in, form opinions about, and seek to understand science.
- Scientific culture is a society-wide environment that appreciates and supports science and scientific literacy. It has important social and aesthetic (affective) aspects.

The aims of scientific awareness, understanding, literacy, and culture may be distilled into five broad personal responses to science. If sufficient people exhibit these responses, then they may be considered as applying to the public. These personal responses may be grouped under the label AEIOU (the vowel analogy): Awareness of science; Enjoyment or other affective responses to science; Interest in science; the forming, reforming or confirming of science-related Opinions (or attitudes); and Understanding of science. The vowel analogy— AEIOU—is a concise label that personalizes the impersonal aims of scientific awareness, understanding, literacy and culture, and thereby defines the purpose of science communication.

Burns et al (2003) defined science communication as the use of appropriate skills, media, activities, and dialogue to produce one or more of the following personal responses to science:

- ◆ Awareness, including familiarity with new aspects of science
- ◆ Enjoyment or other affective responses, e.g. appreciating science as entertainment or art
- ◆ Interest, as evidenced by voluntary involvement with science or its communication
- ◆ Opinions, the forming, reforming, or confirming of science-related attitudes
- ◆ Understanding of science, its content, processes, and social factors

The purpose of science communication was described by Burns et al (2003) with a vowel analogy (AEIOU), a concise label that personalizes the impersonal aims of scientific awareness, understanding, literacy and culture:

- ❖ Public awareness of science aims to stimulate awareness of, and positive attitudes (or opinions) towards science.
- ❖ Public understanding of science (its content, processes, and social factors).
- ❖ Scientific literacy, when people are aware of, interested and involved in, form opinions about, and seek to understand science.
- ❖ Scientific culture is a society-wide environment that appreciates and supports science and scientific literacy.

#### **15.4 PUBLIC ENGAGEMENT WITH SCIENCE (PES).**

Another term, frequently used in relation with communication science is Public Engagement with Science (PES).

As outlined by M.C. Callie et al (2009), Public Engagement with Science involves scientists and publics working together, and allows people with varied backgrounds and scientific expertise to articulate and contribute their perspectives, ideas, knowledge, and values in response to scientific questions or science-related controversies. It is framed as a multi-directional dialogue among people that allows all the participants to learn.

Science communication may involve science practitioners, mediators, and other members of the general public, either peer-to-peer or between groups.

The main types of science communication methods were described by Rowe and Frewer (2005) as a three pronged approach consisting of:

- ❖ Communication (information flowing from the „sponsor“- scientific organization- to public representatives);
- ❖ Consultation (direction of travel of information from public representatives to the sponsor)
- ❖ Participation (two way communication between sponsor and public representatives)
- ❖ Bucchi (2008) presented a similar multi-model framework that involves: Transfer, Consultation and Knowledge- Co-Production.

Science for All (2010) presented a three key communication approaches: Transmit (inspire, inform, change, educate, build capacity and involvement or influence the others decision), Receive (use the experience, views, skills, knowledge of others to inform, inspire, educate or build your own capacity or decision), Collaborate (collaborate, consider, create or decide something together). Any science communication activity involves a mix of these approaches according to the needs of the audience and the scientist involved.

#### **15.5 MODALITIES TO COMMUNICATE SCIENCE.**

There is a breadth of possibilities to communicate science through:

- ◆ Traditional journalism (both print and broadcast)
- ◆ Live or face to face events: public lectures, debates, dialogue, science centers, science museums, etc.
- ◆ Online interactions: online journalism, internet sites, blogs, wikis, podcasting, Facebook, Twitter, other social media activities, etc.

In the age of the internet, social media tools offer a powerful way for scientists to boost their professional profile and act as a public voice for science. As the benefits become more apparent and dedicated metrics are developed to supplement scientists' portfolios, social media may soon become an integral part of the researcher's toolkit.

Researchers and students in the field of science need to be taught about social media in order to understand how it works, how it affects science and life, to become aware of social networks and use them efficiently.

According to Bik and Goldstein (2013) public visibility and constructive conversation on social media networks can be beneficial for scientists, impacting research in a number of key ways:

- online tools improve research efficiency
- online visibility helps track and improve scientific metrics
- social media enhances professional networking
- Broadening „broader impacts”, etc.
- Scientists can maximize their reach by considering the following points:
- establish a professional website
- locate pertinent online conversations
- navigate the deluge of online information
- interact with diverse participants
- Reach your audience.

Whatever channel of communication is chosen, effective communication suppose two important things: rationality, that in the planning stage helps to identify the opportunities, but above all the limitations of communication; and the ability to construct, as in any literary text, a dialogue with the public, imagining for a moment what the reaction may be to what is said and consequently adapting it to the answer.

At the same time there are some rules that must be followed:

- to respect the factual truth
- to not disregard the possible negative consequences of the research (Carrada, 2006)
- to not emphasize the results more than is rightful because a public that has been disappointed once, will be sceptical forever
- to not omit other options
- to declare possible conflicts of interest
- To be ethical, accountable and transparent (Science for all, 2010).

Scientists have to declare the values of their work, but also to divulge the social implications of their work as well the work of others, and their own opinion, positive or negative. Nowadays there are enormous ways for scientists to make themselves heard so as, on one hand, their work to matter and on the other hand, the public to be well informed.

According to Fischhoff and Scheufele (2012) science communication must perform four interrelated tasks:

- identify the science most relevant to the decisions that people face
- determine what people already know
- design communication to fill the critical gaps (between what people know and need to know)
- Evaluate the adequacy of those communications.

Science communication as a term that “encompasses communication between:

- groups within the scientific community, including those in academia and industry
- the scientific community and the media
- the scientific community and the public
- the scientific community and government, or others in positions of power and/or authority
- the scientific community and government, or others who influence policy
- industry and the public
- the media (including museums and science centres) and the public
- The government and the public.”

Media and activities A wide variety of media and activities are necessary to cater for the large range of personalities, learning styles, social and educational backgrounds that people bring to their experience with science. Although the following list is far from comprehensive, it gives a broad overview of some common approaches. Examples of formal science communication which, like formal learning, “. . . typically are well structured, compulsory, assessed, planned, and solitary” include:

Science education at schools, colleges, and universities that may include lectures, tutorials, workshops, laboratory sessions and other learning activities

- Accredited courses and training programs
  - Academic and professional conferences, presentations, and seminars
  - Production of science textbooks and distance education materials
- Examples of informal science communication which “. . . are more often voluntary, non-assessed, accidental, and social” include:
- Science centres and museums
  - Media programs or coverage on film, television, radio, or in print
  - Community or Internet forums on scientific topics
  - Science groups, clubs and societies
  - Computer-based activities on CD-ROM, DVD, or WWW
  - Science shows and theatre
  - Open days at universities and research organizations
  - Popular science books and magazines
  - Community or school-based involvement in collecting research data
  - Science competitions, events and festivals

## **15.6 THE EIGHT STEPS ARE OUTLINED IN SCIENCE COMMUNICATION RECONSIDERED**

The eight steps are as follows:

1. Scientists and science organizations should pursue a trust and dialogue-based relationship with the public. More forums, conferences, and other public dialogue initiatives should be held. The goal is not to persuade or sell the public on the importance of science, but to “democratize” public input about scientific issues so that members of the public can meaningfully participate in science related decision making.
2. Scientists and science organizations need to recognize the importance of framing science-related issues. Science communication efforts need to be based on careful

audience research. Different frames of reference that better communicate the nature and relevance of scientific issues across a diversity of audiences should be identified and tested. This research on framing can be used to structure dialogue and to move public discussion beyond polarized arguments and entrenched positions.

3. Graduate students at science institutions should be taught the social and political contexts of science and how to communicate with the media and numerous publics. Graduate students are future spokespeople and decision makers. They need to understand the significance of research in the field of science communication. These programs should include specialized electives for doctoral students but also new interdisciplinary degree programs that combine scientific training with course work in communication, ethics, and policy.
4. Factors that facilitate media hype and errors should be recognized and addressed. Researchers should resist the temptation to describe their studies using inflated metaphors and terminology, such as “ground breaking,” and remain true to the significance of a study. Research funding and methodological details need to be included in media coverage so that the public may better assess credibility. Short term gains in media credibility should not be valued above longer-term relationship building with journalists, decision makers, and the public.
5. Science communication initiatives should investigate new forms of digital media and film to move beyond traditional popular science outlets, such as science newspaper columns, science magazines, and television programs like PBS’s NOVA. This includes finding ways to create opportunities online for incidental exposure among key audiences not actively seeking news, information, and science-related content.
6. Scientific organizations need to track science-related media coverage (news, entertainment, etc.) to be aware of the numerous cultural contexts through which the public interprets science. National newscasts, talk radio, blockbuster films, entertainment TV, and late night comedy provide broader audiences with alternative messages about science topics and can be important outlets for science communication.
7. Journalism schools and news organizations should develop a science policy beat to address the gap between journalists covering science and those covering politics. Developing such a beat and training journalists to understand both science and policy would provide important background for science policy debates.
8. New models of journalism—whether foundation, university, or government supported—are needed. The for-profit journalism business model is failing and specialty journalists, such as science journalists, are losing their jobs. In addition, new media formats offer another avenue for public participation, as user generated content can enhance professionally produced content.

### **15.7 NEED OF SCIENCE JOURNALISM**

1. Science Journalism or newspapers were a lesser and later development.
2. ‘Scientifically objective’ ruled out the bane of personal bias, prejudice, inclinations, predilections.
3. Science Journalism calls for a scientific temper, objective appraisal, analysis and narration, whereas, the modern-day media is sustained by dramatized news which makes an impact.
4. In the interest of ‘topicality’ those subjects are overlooked and ignored which need investigation, critical analysis, and adequate technical knowledge.

5. This short coming again high lights the need for gunnies work in the field of Science Journalism.
6. There is veritable 'Knowledge explosion' in the field's life Sciences, medicine, communication, electronics, during research nuclear energy, earth Sciences. There is a need to communicate this knowledge to the masses and to make them aware these.
7. To the common people the scientific truth is whatever is purveyed by the press, radio and the TV. Thus pertinent questions to be considered are.
8. Present media focus is generally more on technology policy related issues and decisions, or on environmental quality, public health, controversies centred on bio engineering, AIDS, changes in temperature of the environment, calamities, horrors of accidents.
9. People concerned about this information's concerning the field of Science and Technology, about changes resulting from new researches, and speculations on the consequent impact on human life, on environment, on surroundings.
10. In fact people are curious to know much more than this. Thus where as it is necessary to provide the common man with information on the contemporary topic, on the other hand it is also necessary to support the pressure lobby advocating polices for promotion and communication of research and exploration in the field of public importance.
11. It is also required to create an atmosphere for the implementation of such decisions and provide financial resource there for. It is necessary to enlarge the scope of Science Journalism in the interest of both these issues.
12. Thus Science Journalism is required to rain force scientific temper and a scientific outlook.
13. One task is to produce Science material in easily comprehensible Hindi or other vernacular language.
14. Science can offer a new platform for meeting the economic, commercial and social challenges.
15. Scientific methods are useful in probing the process of social development.
16. The basic objective of Science is to initiate the logical thought process and a critical mind.
17. Science is expected, or should be expected to offer a new positive role in the scenario where there is rampant jealousy, cut throat competition, even increasing disparities among man and man.

#### **4.15.7. The importance and usefulness of the science Journalism**

1. Science Journalism requires presentation of scientific facts, concepts, knowledge and information in the language of Journalism. This style includes confidence is the people and readily winning the confidence and acceptance of the people for example it will be seen that the popular series 'Why and How' regular columns and features in newspapers, magazines journals dwelling upon health and fitness, the TV programs, quite often do not present scientific knowledge, but it is their presentation only makes them appear as if these are the ultimate truths.
2. The news Papers are full of 'daily forecast', astrological and pseudo-scientific claims.
3. In the name of science today is media purveys material on a set pattern and this is justified as situational technicality. The importance of science Journalism can be established strongly by presenting fully material authenticating human life, and its various aspects.

4. People are attracted only to those news items in the newspapers which appear to impact their day to day life and the personal health. It was found that the most popular source turned out to be newspapers and magazines next was TV and the last was discussion and consultation with the doctor.
5. Media also help decision making in several personal matters, like the use of contraceptives or family planning options.
6. Science Journalism writing is useful in the true sense only when it targets the common people are in a simple and easy style. Such writing can be rendered useless if they bristle with difficult technical terminology. In case it is unavoidable to use a technical term, it should be explained.
7. Utility of a meaningful science Journalism lies in the presentation for the people of factual information or knowledge on health, alternative medicine, physical fitness, life sciences, food, material related to the contexts of life.
8. The greatest usefulness of science Journalism is for the children. The children are the carrier of traditions and yet the hope for the future.
9. The industrialization has made the human life easy, but there is no awareness about its negative and permissions effects on the environment. The labour and children working in the glass industry in Firozabad face diseases and untimely death. They face adverse circumstances and an environment which is laden with chemicals and toxins. It is the task/ job of science Journalism to make people aware of it, to give them knowledge about it, to enlighten them on it.
10. The effectiveness of the visual medium can become more if it is coupled with science Journalism.

### 15.9 SOME OF THE REAL LIFE SITUATIONS

Ex: Iodine dependent deficiency has been officially widely publicized. Use of non-iodized salt makes for iodine deficient food, which leads to Goitre and cretinism. Therefore, the Government has prohibited marketing of ordinary salt.

On the one hand manufactures of ordinary salt is facing loss, and on the other iodized salt are costlier. Further the manufactures of iodized salt do not mix iodine in salt, but they use a derivative of iodine, an iodate. This iodate lasts only for three months it is to be noted that the whole process of making salt iodized, packing, distribution, reaching the consumer itself takes almost three months. Moreover, the house wives store the unpacked salt in open containers. There is no concept of using the salt as 'table salt'. The salt is put in the vegetables or pulses during cooking by this time the iodine content is destroyed. Finally it is the ordinary iodine less salt that is eaten.

### 15.10 SUMMARY

Science in fact is a method, a process, a system. Science is also a meter of temperament. But Science Journalism or science popularization does make a scientist out of a science Journalist or out of every common man. All it aims at is inculcation and promotion of a scientific temper, a scientific outlook and a scientific attitude. It depends on the use of such natural faculties as inquisitiveness, curiosity, observation, testing knowledge and experimenting, rationality, logicity and enlightenment.

### 15.11 TECHNICAL TERMS

**PAS:** Public awareness of science

**PUS:** Public understanding of science

**SC:** Scientific culture

**SL:** Scientific literacy

**PES:** Public Engagement with Science.

**Public:** Every person in society. It is acknowledged that “the public” is a very heterogeneous group.

**Scientists:** in industry, the academic community and government.

**Mediators:** communicators (including science communicators, journalists and other members of the media), educators, and opinion-makers.

**Decision-makers:** policy makers in government, and scientific and learned institutions.

**General public:** the three groups above, plus other sectors and interest groups. For example, school children and charity workers.

**Attentive public:** the part of the general community already interested in (and reasonably well-informed about) science and scientific activities.”

**Interested public:** is composed of people who are interested in but not necessarily well informed about science and technology.

**Lay public:** identifies people, including other scientists, who are non-expert in a particular field.

**Science community or science practitioners:** people who are directly involved in some aspect of the practice of science.

**Online interactions:** online journalism, internet sites, blogs, wikis, podcasting, Facebook, Twitter, other social media activities, etc.

### 15.12 SELF-ASSESSMENT QUESTIONS

1. What kind of Science Subjects and expositions appear in the modern day newspapers and magazines?
2. What explicit or implicit message is conveyed to us by these selected news or reporting.

### 15.13 SUGGESTED READINGS

1. Bik, H. M., Goldstein, M. C. (2013). An Introduction to Social Media for Scientists, PloS Biol11(4), <http://www.plosbiology.org/article/info%3Adoi%2F10.1371%2Fjournal.pbio.1001535>.
2. Burns, T. W., O'Connor, D. J. Stocklmeyer, S. M. (2003). Science Communication: a Contemporary Definition, Public Understanding of Science 2003; 12; 183.
3. Science for All (2010). Public Engagement with Science and Society – a conversational tool. London: Department for Business, Innovation and Skills, <http://interactive.bis.gov.uk/scienceandsociety/site/all/2010/09/23/public-engagement-for-science-and-society-a-conversational-tool/>.
4. ICSU (2005). Science and Society: Rights and Responsibilities'. ICSU Strategic Review.



# LESSON 16

## SCIENCE WRITING IN MEDIA

### Objectives

- To understand the tips in science writing.
- To learn about Popularization of science among children.
- To study the Duties and code of Conduct of Science Journalist.

### Structure

- 16.1 Introduction
- 16.2 Checking the Facts
- 16.3 Ten Time-Tested Tips
- 16.4 Writing the Story
- 16.5 The Usual Suspects
- 16.6 Popularization of science among children
- 16.7 Tips of science writing for the children
- 16.8 Duties and code of Conduct of Science Journalist
- 16.9 Case study
- 16.10 Summary
- 16.11 Technical Terms
- 16.12 Self-Assessment questions
- 16.13 Suggested Readings

### 16.1 INTRODUCTION

Traditionally, many science writers have focused on reporting from the “Big Four” peer-reviewed journals: *Science*, *Nature*, *the New England Journal of Medicine*, and the *Journal of the American Medical Association*. *Science* and *Nature* are major sources of science news, and they should be. They are the premier interdisciplinary journals of the English-speaking world, and therefore ought to be publishing the most important research of the broadest interest to the scientific community. Naturally, such research is most likely to be of interest to the general public as well.

In recent years, the Big Four have been joined by several others as regular sources of science news—particularly the *Proceedings of the National Academy of Sciences*, the biology journal *Cell*, and the neuroscience journal *Neuron*. And the Nature publishing group has flooded the media journal market with a whole roster of specialty journals on such topics as neuroscience, biotechnology, genetics, and materials science. Other important journals for medicine include *Annals of Internal Medicine* and several published by the American Heart Association, such as *Circulation* and *Stroke*. An intriguing newcomer in late 2003 from the Public Library of Science is *P Lo S Biology*, an “open-access” journal available free online.

### 16.2 CHECKING THE FACTS

- Don’t Trust the Blurbs on Tip Sheets: They can be helpful, but they can also be wrong.

- Don't Trust News Releases: They can be helpful, but they can also be wrong. Verify release information from the actual paper or the paper's authors.
- Be Aware of the Pitfalls of the Peer-Review System: Some journals have more rigorous peer review than others, and even the best journals occasionally slip up.
- Ask a Paper's Authors about Previous News Coverage of Their Work: You want to make sure that what you think is new really is, and wasn't widely reported last year after a presentation at a meeting.
- Ask About Potential Conflicts of Interest: For example, do any of the researchers have a financial stake in a company that could profit from a study's findings?
- Check Trivial Facts: For example, check a scientist's affiliation and title. Sometimes the title page of a journal article contains mistakes on such matters.

### 16.3 TEN TIME-TESTED TIPS

1. Read your work out loud. You will be able to hear rhythm and flow of language this way, and you really cannot hear it when reading silently.
2. Don't be shy. Ask other writers to read a draft for you. Everyone gets too close to the story to see the glitches, and a dispassionate reader is a writer's best friend. Good writers gather readers around them for everything from newspaper stories to whole books (which require really good friends).
3. Think of your lead as seduction. How are you going to get this wary, perhaps uninterested reader, upstairs to see your etchings? You need to begin your story in a way that pulls the reader in. My favourite basic approach goes seductive lead, so-what section (why am I reading this), map section (here are the main points that will follow in this story). That approach leads me to my next tip, which is
4. Have a clear sense of your story and its structure before you begin writing. If you think of a story as an arc, in the shape of a rainbow, then it's helpful to know where it will begin and where it will end so that you know in advance how to build that arc.
5. Use transitions. A story has to flow. Leaping from place to place like a water strider on a pond will not make your prose easy to follow.
6. Use analogies. They are a beautiful way to make science vivid and real—as long as you don't overuse them.
7. In fact, don't overwrite at all. And never, never, never use clichés. If you want to write in your voice, generic language will not do. In my class, there are no silver linings, no cats let out of bags, no nights as black as pitch. A student who uses three clichés in a story gets an automatic C from me.
8. Write in English. This applies not only to science writing but to all beats in which a good story can easily sink in a sea of jargon.
9. Picture your reader. I find it helpful to imagine a specific reader who is unnerved by science to begin with and would stop reading my story the minute I threw a multisyllabic medical term in her face. Yes, her face. My reader is an elderly woman with curlers in hair, half-doing over the paper. If I can snare her, the science-savvy reader is a snap.
10. Have fun. Science is intriguing, funny, and essential to everyday life. If we write too loftily, we lose some of the best stories and the ones that our readers most relate to.

### 16.4 WRITING THE STORY

From the moment you begin considering a story on a journal paper, you should be thinking about the story's opening sentence or paragraph: the all-important lead (or lead, as it's commonly spelled in our world). What is the key new point? What is the most important, most interesting thing about it? How can you capture all that in a concise, clear, and catchy way?

From then on, it's go with the flow. Support the lead with the facts. Provide a quote that dramatically expresses significance. Work in the background that provides context—both basic information and previous relevant findings. Give details that answer all the questions you can imagine a reader asking. And say what will or will not happen next. Sometimes you also need to tell what the results do not mean, as in medical stories where a promising finding does not imply an immediate cure

### **1. Structure of a Science and Technology based Report**

The structure of science and technology based reports is not different from the structure of the general news. First comes the intro, which should be the best part of a report, and then, the body, in which everything is explained in detail. It is not necessary to inculcate all the five W's and one H in the intro, but all of them should be answered in the complete report. The most important factor is practice. Greater the amount of practice in the art of newswriting, lesser the amount of time wasted in rewriting stories and better the outcome of your efforts.

### **2. Radio**

Writing for broadcasting is, of course, writing for speaking. Writing for broadcast comes in various favours. I've written stories as short as 30 seconds, and as long as 30 minutes. Although it's rarer these days, the one- hour radio documentary is not unheard of. But in all broadcast formats, long or short, there's one crucial rule: Keep it moving forward. Your viewers or listeners can't flip back to the start to remind themselves what happened five minutes ago. If too much time has passed since you last introduced a character, introduce him again.

The best writing for broadcast, both radio and television, involves telling a story. Stories are engaging. They give you a structure. They have a beginning, middle, and an end. They have characters. They set up a conflict, which helps you see a scientific issue in a more exciting way.

In radio, reporters sometimes fall into the trap of becoming beguiled by sound and forgetting about story. Tell the story. Let the sound help you tell the story. In fact, more often than not, you're not going to get great sound for a story

The other issue you have to contend with is lung capacity. But if your sentences are too long, all that people will hear will be you gasping for breath. Keep your sentences no longer than 10 words each. It's really not that hard. People do it all the time in normal speech. Don't hesitate to use sentence fragments. Use action verbs. Best of all, verbs that allow you to omit adverbs. The typical radio piece alternates narration and sound bites, or actualities. Digital audio editing also allows you to adjust sound, add ambient sound, and fade one piece of audio under another, all things that used to require a fully equipped audio studio.

### **3. TV**

Just as radio depends on sounds, television depends on pictures. But here's a surprise that Peggy has pointed out: It also depends on anecdote. Science on television generally falls into two categories: the short news- style piece, one and a half to three minutes in length, or the documentary, usually 30 to 60 minutes long.

The short newsy piece is often pegged to scientific journal reports, government announcements, or disease outbreaks. These pieces run on local or network nightly news programs or cable news weekly programs

First, summary by anchor person of the news, introduces reporter. Next, reporter (that is, you) in voice-over of a picture. And the picture? Almost always it is a patient. After all, this is a story, and you want to engage a viewer who has a remote control at the ready and can change the channel in a fraction of a second. It would be impossible to start with the study results—people need a context of what the treatment does. It would be dull, and possibly confusing, to start with a picture of a blood vessel and start talking about the study results. So you have to find a patient to illustrate the point. Usually, that's done by contacting a local hospital or the doctors involved in the study.

#### **4. Writing for the Web**

Web stories have to be shorter and snappier than stories in print. That's certainly a challenge for science writers, since the details of a scientific discovery can be so important. But there are ways to make even a complicated story more palatable for click-happy Web users:

##### **a) Be Direct**

Wire-service leads tend to work better than the indirect, magazine-style lead. That's doesn't rule out adding a little drama to the start of your story.

##### **b) Chunkify**

At the website, stories can run as long as 1,200 words before the editors squawk. In those cases, however, we try to organize the story into modules or "chunks" of 300 to 600 words, separated by subheadings. That improves readability on the Web, because the story doesn't look so daunting, and readers can skim past modules if they want to. It's also good discipline for writers. So sharpen your outlining skills and break that story into smaller chunks.

##### **c) Accessorize**

It's a short hop from the modular approach to an approach in which the supporting elements of a story become clickable boxes and sidebars within a story. Flash-based graphics, blogs, forums, chats, and other "accessories" could even be used as the primary media for telling the story.

##### **d) Hyper linkify**

Unlike a magazine, newspaper, or broadcast network, online stories can provide hyperlinks to resources elsewhere on the Web.

##### **e) A Toy Maker's Toolbox**

Over the years, Web journalists have developed a standard set of techniques for going beyond static text, pictures, audio, and video of older media. Here are some of the frequently used tools and toys of the trade.

##### **f) Galleries**

A slideshow is a series of pictures and captions you click through, one by one. The captions can be enhanced by audio or video. A video gallery is a variation on the theme, where you can click on a series of video highlights.

##### **g) Pop-Ups**

Self-contained, Flash-based graphic presentations can be created to provide a virtual tour, explain how something works, or tell a story.

##### **h) Surveys**

Our "Live Vote" asks users what they think about a controversial subject:

##### **i) Quizzes**

These are multiple-choice quizzes that are scored by the computer when you hit a button. You can use them for brainteasers or for more serious purpose

#### **j) In-Story Primers**

Large masses of facts—ranging from glossaries to timelines to profiles of key players—can be handled in a scrollable or clickable space embedded within the text.

#### **k) Forums**

Web-based discussion boards are probably the most interactive features you can offer. They let users talk about the news with each other as well as with experts who are monitoring the discussions.

#### **l) Blogs**

These Arrays of time-stamped Web postings can serve as a reporter's journal, a briefs column, a means of stimulating and organizing feedback to stories.

### **16.5 THE USUAL SUSPECTS**

There are some questions that are good to use in interviews almost no matter what the topic. By the time you are through with these, you are bound to have thought of other questions.

So, filed under

What to ask when you have zero seconds to prepare:

What is new about this?

What is not new?

What is the significance of this, and why?

Who will disagree with this?

What is the evidence this is based on?

Who funded this research?

What will be done next?

Who else should I talk to?

What is your connection to this, and why did you get interested?

How can I reach you later, including in the evening?

#### **1. The essay is a genre-buster.**

Nonfiction genres—article, book review, memoir, news report—form a kind of taxonomy, like that a biologist imposes on the animal kingdom, or an astronomer on celestial objects. Yet the essay is a genre that subverts the idea of genre. It's not news. It bears a personal stamp, demanding something of the writer's insights, experiences, or idiosyncratic take. But once past these slim criteria, to call it "essay" says precious little about it.

The book review is an essay whose subject is a book. The op-ed is an essay of about 800 words appearing opposite the editorial page in a newspaper. The introduction to a book is an essay framing the history, reportage, or hard science in the book's body. So, at the other end, is its conclusion.

#### **2. Advantages/Challenges**

One of the great advantages of being a science writer for a science-oriented government agency is working with scientists who are dedicated to (in the case of NIH) understanding and curing disease and relieving suffering in the world. One of the greatest challenges for government public information officers is that scientists sometimes don't appreciate the importance of making their findings available to the general public. They often

are at odds with the news media. Reporters often are looking for the breaking story. But science doesn't usually break forth. It takes baby steps, over the course of years or generations. Some scientists fear that their findings will be contorted by the news media into something they're not, to make them more newsworthy. The professional communicator is the mediator between these two viewpoints. We can work with journalists to assure that the story is both significant and accurate. And good experience with the media can convince scientists that there is value in increasing the public understands of science.

### **3. Corporate Public Relations**

Public Relations is not just sending out a press release or invitations to an event. It is the profession of managing communications between an organization and its audiences. As public relations professional, you develop and execute communications programs that consider and support such corporate goals as reputation, the selling of products or services, recruitment of employees, or encouragement of investments. You can do this as an in-house professional at the company or as a client service if you work in an agency.

If you want to apply your science journalism skills to corporate public relations, they will be highly prized by pharmaceutical, biotechnology, medical device, technology, and related companies. You not only comprehend the facts about environmental, physical, or life sciences, you can make them understandable to others. You can accurately and efficiently translate the function and value of a product or service to audiences as varied as customers, stock- holders, regulators, and journalists, all of whom have different levels of scientific understanding.

To manage corporate public relations, you need a program, which is the blueprint that captures the vision and the means to obtain it. Programs are very structured and have goals, objectives, strategies, and measurable tactics to achieve them. This structure allows planning of staffing, budgets, and timing. The program also must determine and measure expected outcomes, that is, "what success looks like," because public relations must be accountable. Many journalists move into public relations as free-lances or staffers who write or produce corporate press releases, media alerts, video news releases, speeches, question and answer documents, annual reports, op-eds, or articles for in-house outlets.

## **16.6 POPULARIZATION OF SCIENCE AMONG CHILDREN**

1. It is hard to come by science news in the pages of news papers
2. In the circumstances it is still more difficult to come across any science news specially targeting the children
3. News is its own definition
4. Similarly it is a moot question as to what 'science news' is
5. Simply reporting about new discovery, inventions, satellites in the space, space crafts, and the like essentially is not science news.
6. Students never grasped the meaning, the spirit of science. Science never became a part of their mental outlook and living style.
7. Science and technology did influence the living moods, but it failed to touch the spirit. In fact the essential thing is to make our outlook scientific.

## **16.7 TIPS OF SCIENCE WRITING FOR THE CHILDREN**

1. Take the children as fiends and address them as such get rid of your superiority complex.
2. Keep in consideration the different back grounds of the children. If there is much diversity, focus on an average level.
3. Keep in view a certain base line knowledge level of the children. Don't treat them as altogether blank.
4. Make minimum use of technical Jargon. Let the language be simple.
5. Don't encourage them repeat and copy. Let there be something new every time.
6. Science does not present the ultimate truth; science is the ceaseless quest after truth.

## **16.8 DUTIES AND CODE OF CONDUCT OF SCIENCE JOURNALIST**

1. Work spiritedly. Don't be arrogant.
2. Stagnation or inaction in a Journalist is his professional death. Propagating stale material, falling in a groove amounts to intellectual death.
3. Don't miss an opportunity to grab news. Don't fail is being innovative.
4. In the field of Journalism, and offensive should be countered with offensive.
5. Adopt new ideas, and views, but don't be fickle be broad minded.
6. Extend the area of friends.
7. Authenticity of information and facts is crucial in science writing. In case of any doubts, check and confirm your facts.
8. Ensure conformity with the IPR, (Intellectual Property Rights) copy right act, patent laws, nuclear energy information regulations, and all other acts and laws which relevant to press.
9. If some disclosure has been made to you on the condition of anonymity respect the confident.
10. Attend promptly to the views and complaints of the readers and the audience. Make all possible amends.
11. In virtue of his professional work, a science Journalist is likely come in contact of high placed and influential persons. But these contacts should not be explored for selfish and personal gains.
12. Independent thoughts/ views self-respect, impartiality, and faculty of discrimination, are the essential qualities for a science Journalist.
13. A science Journalist should own up the responsibility for the scientific news are information published, or exhibited, disseminated. He should also respect.
14. A science Journalist should always be ready to disseminate new information which may advance the public good.
15. Indigenous science Journalism, especially in Hindi or vernacular, is still in its infancy. In the interest of its rapid development it is necessary make new and bold experiment.
16. A science Journalist has a duty in public interest to collect and disseminate complete and correct information in case of any technology disaster or and epidemic this is besides his duty to communicate commonly useful information concerning everyday life.
17. A science Journalist should present, besides high profile and elitist science information, knowledge of interest to a man in the street or in the fields.
18. The negative and destructive aspects of science should not be sensationalized.
19. The science writers already established in the field should take it as their duty to guide, encourage and promote the upcoming writers.

20. It is essential for a science Journalist to be an avid reader. He should have studied the basic literature. But at the same time it is very important for him to read international science journals, proceedings and reports. Not only has that he committed all the information to his memory. He should make notes for further reference.

## 16.9 CASE STUDY

A voluntary organization in Madhya Pradesh ‘*Eklavya*’ during its operations has found that in the educational programs being implemented by it in the whole of Hoshangabad district and in some schools of other 13 districts, that by the time a student passes out of 8th class, he must develop a scientific outlook which he could use in his tackling situation in his future life.

During the implementation of this educational program, the organization felt the need for some formal literature besides the curriculum, which could help develop scientific outlook among the children. It was also found that whatever child literature or magazines were available; they also missed this focus and interest. It was to make this deficiency that the magazine *Chak Mak* was born. As a matter of fact ‘*Chak Mak*’ is not a common place science magazine for children, but it is a complete science magazine for children. It is making almost every effort to inculcate scientific outlook among children.

The magazine *Chak Mak* published by the MP NGO *Eklavya* has two very interesting features. One is a column, ‘*Kyon – Kyon*’ (Why...Why), meant to examine the commonly held belief or notions. The other is, ‘*Sawali Ram*’, the latter deals with queries sent by the child readers.

## 16.10 SUMMARY

Science does move forward, often in unexpected ways. Unlike other areas of government where policy and regulation can be the sole determining factors in career direction, in a science-oriented agency it is the novel and unpredictable events of science that can set the course of your career. In the 1970s no one could have predicted the impact AIDS would have on the nation or the careers of science writers. In the future, biodefense and the related issues of smallpox, anthrax, and ricin may take our careers in a new direction. Or new and emerging infections, such as SARS or monkey pox, COVID 19 may occupy our time. It is the unpredictability of science that makes careers in science agencies both challenging and satisfying.

## 16.11 TECHNICAL TERMS

**P L o S:** Public Library of Science

### a) Be Direct

Wire-service leads tend to work better than the indirect, magazine-style lead. That doesn't rule out adding a little drama to the start of your story.

### b) Chunkify

At the website, stories can run as long as 1,200 words before the editors squawk. In those cases, however, we try to organize the story into modules or “chunks” of 300 to 600 words, separated by subheadings.

### c) Accessorize

It's a short hop from the modular approach to an approach in which the supporting elements of a story become clickable boxes and sidebars within a story.



**d) Hyper linkify**

Unlike a magazine, newspaper, or broadcast network, online stories can provide hyperlinks to resources elsewhere on the Web.

**e) A Toy Maker's Toolbox**

Over the years, Web journalists have developed a standard set of techniques for going beyond static text, pictures, audio, and video of older media.

**f) Galleries**

A slideshow is a series of pictures and captions you click through, one by one. The captions can be enhanced by audio or video.

**g) Pop-Ups**

Self-contained, Flash-based graphic presentations can be created to provide a virtual tour, explain how something works, or tell a story.

**h) Surveys**

Our "Live Vote" asks users what they think about a controversial subject:

**i) Quizzes**

These are multiple-choice quizzes that are scored by the computer when you hit a button. You can use them for brainteasers or for more serious purpose

**j) In-Story Primers**

Large masses of facts—ranging from glossaries to timelines to profiles of key players—can be handled in a scrollable or clickable space embedded within the text.

**k) Forums**

Web-based discussion boards are probably the most interactive features you can offer. They let users talk about the news with each other as well as with experts who are monitoring the discussions.

**l) Blogs**

These Arrays of time-stamped Web postings can serve as a reporter's journal, a briefs column, a means of stimulating and organizing feedback to stories.

**16.12 SELF-ASSESSMENT QUESTIONS**

1. Explain the tips for science writing?
2. How to popularize of science among children?
3. Elucidate the Duties and code of Conduct of Science Journalist?

**16.13 SUGGESTED READINGS**

1. Marzia Mazzonetto (2005) Science communication in India: current situation, history and future developments, Journal of Science Communication JCOM 4 (1), March 2005
2. Vilanilam JV, Science Communication and Development, 1993, Sage Publications, New Delhi.
3. Patariya Manoj, EUSJA News, Spring 2002, Strasbourg, France. Patariya Manoj, Origin and Evolution of Science Communication in India, Ph.D. Thesis, 1998 (Under publication).

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## LESSON 17

# SCIENTIFIC TEMPERAMENT

### Objectives

- To define the concept of scientific temperament and critical evaluation of information;
- To comprehend the key aspects of scientific temperament;
- To understand the overview of scientific temperament;
- To know the significance of scientific temperament for the researchers and media professionals;
- To know the importance of science conventions and the origin and development of science conventions/conferences;
- To comprehend the famous phrase “three Principles of usefulness”;

### Structure

- 17.1. **Introduction**
- 17.2. **Historical background of scientific temperament**
- 17.3. **Key aspects of scientific temperament**
- 17.4. **Why is scientific temperament so important?**
- 17.5. **Science Conventions**
- 17.6. **Purpose of the scientific community**
- 17.7. **Three Principles of Usefulness**
- 17.8. **Summary**
- 17.9. **Technical Terms**
- 17.10. **Self-Assessment Questions**
- 17.11. **Suggested Reading**

### 17.1 INTRODUCTION

Scientific temperament refers to a set of qualities, attitudes, and approaches that are essential for engaging with the world in a rational, evidence-based, and objective manner. It involves a mind-set and a way of thinking that is conducive to scientific inquiry and critical evaluation of information.

All the characteristics and attitudes those are essential for approaching the world in a rational, empirical, and objective manner. It involves a mind-set and approach to inquiry that is based on evidence, critical thinking, and open-mindedness. Cultivating a scientific temperament is essential for advancing knowledge, making informed decisions, and solving complex problems in a rigorous and reliable manner. It underpins the progress and integrity of scientific endeavours across various disciplines. You will understand some key aspects of scientific temperament.

A Jesuit scholar Thomas Aloysius Hughes gave a short definition in 1893, saying, "A scientific temper means a scrupulous and rigid exactness. Which is the outcome of exact science. Bertrand Russell in 1922 used the example of Albert Einstein to explain the meaning of scientific temper. He said that we have had in recent years a brilliant example of the

scientific temper of mind in the theory of relativity. His theory upsets the whole theoretical framework of traditional physics. It is almost as damaging to orthodox dynamics as Darwin was to Genesis. Yet physicists everywhere have shown complete readiness to accept his theory as soon as it appeared that the evidence was in its favor. He has not built a monument of infallible dogma to stand for all time. There are difficulties he cannot solve; his doctrines will have to be modified in their turn as they have modified Newton's. This critical dogmatic receptiveness is the true attitude of scientific temperament.

The first Prime Minister of India, Jawaharlal Nehru used and popularized the phrase "scientific temper" in his book *The Discovery of India*. He points out that the scientific temper is the temper of a free man. He observed that we live in a scientific age, so we are told, but there is little evidence of this temper in the people anywhere or even their leaders. Nehru believed that we need the scientific approach, not merely for the application of science but for life itself and the solution of its many problems. What is necessary is critical temper of science, the search for truth and new knowledge, the refusal to accept anything without testing and trial, the capacity to change previous conclusions in the face of new evidence, the reliance on observed fact and not on pre-conceived theory, and the hard discipline of the mind. Nehru contended that the scientific temper is the opposite of the method of religion, which relies on emotion and intuition and is (mis)applied "to everything in life, even to those things which are capable of intellectual inquiry and observation."

## 17.2 HISTORICAL BACKGROUND OF SCIENTIFIC TEMPERAMENT

The concept of scientific temperament has evolved over time and is closely linked to the development of the scientific method and the broader cultural and philosophical shifts that accompanied it. Here is a brief overview of the history of scientific temperament.

In ancient civilizations like Greece and India, there were individuals who demonstrated early forms of scientific inquiry. Thinkers like Aristotle in Greece and Charaka in India emphasized systematic observation and classification of natural phenomena.

During the medieval period in Europe, there was a dominance of religious and philosophical explanations for natural phenomena. However, some scholars like Roger Bacon advocated for empirical observation and experimentation.

The Renaissance period (14th to 17th centuries) witnessed a resurgence of interest in classical knowledge and a revival of scientific inquiry. This era saw the emergence of figures like Leonardo da Vinci, who emphasized the importance of direct observation and empirical investigation.

The Scientific Revolution (16th to 18th centuries) marked a significant shift in how science was approached. Scientists like Galileo Galilei, Johannes Kepler, and Isaac Newton made ground breaking contributions to physics and astronomy, often through rigorous experimentation and mathematical analysis.

The Enlightenment era (18th century) emphasized reason, empirical observation, and the scientific method as the primary means of acquiring knowledge. Thinkers like Francis Bacon and René Descartes laid the philosophical groundwork for this approach.

The 19th century saw the consolidation and institutionalization of the scientific method across various disciplines. Scientific societies, universities, and research institutions began to take shape, providing organized settings for scientific inquiry.

The 20th century brought about significant advancements in various scientific fields, including physics, chemistry, biology, and medicine. The development of quantum mechanics, relativity theory, and the emergence of molecular biology were some of the key milestones.

The 20th century also saw a growing emphasis on interdisciplinary research and the application of scientific knowledge to address societal challenges.

Throughout history, there have been key figures and movements that have championed the principles of scientific temperament. They advocated for the systematic and empirical investigation of the natural world, the rejection of dogma and superstition, and the pursuit of knowledge for its own sake and for the betterment of humanity.

Today, scientific temperament remains a fundamental aspect of modern scientific practice, guiding researchers in their pursuit of knowledge and innovation across a wide range of disciplines. It continues to evolve alongside advances in technology, changes in societal values, and new philosophical and ethical considerations.

### 17.3 KEY ASPECTS OF SCIENTIFIC TEMPERAMENT

- 1. Empirical Observation:** A scientific temperament emphasizes the importance of gathering data through direct observation or experimentation. This means relying on evidence that can be observed, measured, or tested.
- 2. Open-mindedness:** It involves being receptive to new ideas and willing to consider alternative explanations or viewpoints. A scientific temperament encourages a willingness to revise one's beliefs in the face of compelling evidence.
- 3. Scepticism:** Scientists maintain a healthy level of skepticism, which means not accepting claims or conclusions without evidence to support them. This helps guard against pseudoscience or unfounded beliefs.
- 4. Objectivity:** Scientific inquiry aims to be as unbiased and impartial as possible. This involves minimizing personal biases and preconceived notions when conducting research or evaluating evidence.
- 5. Critical Thinking:** Scientists are trained to think critically, which means analyzing information, evaluating the strength of evidence, and making decisions based on rational and logical reasoning.
- 6. Systematic Approach:** A scientific temperament involves following a structured and systematic approach to investigation. This includes formulating hypotheses, designing experiments or studies, collecting data, and analyzing results.
- 7. Hypothesis Testing:** Scientists formulate hypotheses (testable explanations or predictions) based on existing knowledge and then conduct experiments or studies to test these hypotheses.
- 8. Ethical Conduct:** Scientific temperament also includes a commitment to ethical conduct in research. This involves honesty, integrity, and transparency in reporting methods, results, and potential conflicts of interest.

**9. Continual Learning:** Scientists have a lifelong commitment to learning and updating their knowledge based on new discoveries and advancements in their field.

**10. Peer Review:** A scientific temperament acknowledges the importance of subjecting research findings to peer review. This process involves having other experts in the field evaluate and critique the work before it is accepted for publication.

**11. Communication Skills:** Scientists should be able to effectively communicate their findings to other researchers as well as the wider public. This includes clear and accurate writing, presentation skills, and the ability to convey complex ideas in a comprehensible manner.

**12. Humility:** Scientists understand that knowledge is always evolving, and no single study or individual has all the answers. They are willing to acknowledge uncertainties and limitations in their research.

Cultivating a scientific temperament is crucial for advancing knowledge, making informed decisions, and solving complex problems in a rigorous and reliable manner. It underpins the progress and integrity of scientific endeavours across various disciplines.

#### 17.4 WHY IS SCIENTIFIC TEMPERAMENT SO IMPORTANT?

**Objective Inquiry:** Scientific temperament emphasizes the importance of approaching problems and questions with an open mind and without preconceived notions or biases. It encourages the use of empirical evidence and systematic methods for investigation.

**Critical Thinking:** It involves the ability to critically analyse information, evaluate evidence, and make decisions based on rational and logical reasoning. Scientists are trained to question assumptions and seek validation through experimentation and observation.

**Scepticism:** Scientists maintain a healthy scepticism towards new ideas and claims, subjecting them to rigorous scrutiny before accepting them as valid. This helps in avoiding pseudoscience or unfounded claims.

**Continuous Learning:** A scientific temperament promotes a lifelong commitment to learning and updating knowledge based on new discoveries and advancements in the field.

#### 17.5 SCIENCE CONVENTIONS

Science conventions, also known as scientific conferences or symposiums, are organized events where scientists, researchers, academics, and experts in a particular field come together to present and discuss their latest research findings, share knowledge, and engage in intellectual exchange. The structure of conventions became more formalized, with sessions organized around specific topics or disciplines. This allowed for more focused discussions and presentations.

Science conventions continue to play a pivotal role in advancing knowledge, fostering collaboration, and facilitating the exchange of ideas within the scientific community. They have become a cornerstone of scientific progress and serve as a testament to the importance of open dialogue and shared learning in the pursuit of understanding the natural world.

An overview of the historical background of science conventions: The Royal Society of London, founded in 1660, is often considered one of the earliest scientific societies. It

played a crucial role in promoting scientific inquiry and organizing meetings for scientists to present their research. The Academe des Sciences in France, established in 1666, was another influential institution that brought together leading scientists of the time.

The American Philosophical Society, founded by Benjamin Franklin and others in 1743, provided a forum for scientific exchange in the American colonies. The proliferation of scientific societies and academies continued throughout Europe and North America, reflecting the growing importance of scientific inquiry in various fields.

The 20th century saw a significant expansion in the number and scope of scientific conventions. Advances in transportation and communication made it easier for scientists from around the world to attend such events.

The post-war period witnessed a rapid increase in scientific research and international collaboration. Conventions became a crucial platform for scientists from different countries to come together and share their findings.

**Advances in Technology and Interdisciplinary:** With the advent of modern communication technologies, virtual and online conferences have become increasingly common, allowing for participation from researchers worldwide without the need for physical travel. Many conventions now also emphasize interdisciplinary collaboration, recognizing the interconnectedness of different scientific fields.

**Diversity and Inclusion:** In recent decades, there has been a growing awareness of the importance of diversity and inclusion in scientific conferences. Efforts are being made to ensure representation from underrepresented groups and to create inclusive environments for all participants. Today, science conventions cover a wide range of disciplines, from physics and chemistry to biology, medicine, social sciences, and beyond. They serve as a platform for researchers to exchange ideas, present their work, and form collaborations on a global scale.

## 17.6 PURPOSE OF THE SCIENTIFIC COMMUNITY

These gatherings serve several important purposes in the scientific community such as:

**Knowledge Dissemination:** Conventions provide a platform for scientists to present their research findings to a wider audience. This helps in disseminating new knowledge and insights within the scientific community.

**Peer Review and Feedback:** Scientists present their work to their peers, who evaluate the quality, methodology, and significance of the research. This process helps ensure the rigor and validity of scientific work.

**Collaboration and Networking:** Conventions offer opportunities for scientists to meet and interact with colleagues from around the world. This networking can lead to collaborations on future research projects.

**Exposure to Diverse Perspectives:** Attending a convention exposes scientists to a diverse range of ideas, approaches, and methodologies within their field. This can lead to fresh insights and innovative thinking.

**Keeping Up with Advances:** Conventions showcase the latest advancements and breakthroughs in a specific field. Staying up-to-date with these developments is crucial for researchers to remain at the forefront of their respective disciplines.

**Professional Development:** Scientists can attend workshops, seminars, and panel discussions on topics related to research methodologies, grant writing, career development, and other relevant skills.

**Access to Resources and Technologies:** Conventions often feature exhibitions or showcases where companies and organizations display the latest technologies, equipment, and resources relevant to the field.

**Publication Opportunities:** Some conventions may have associated journals or proceedings where selected research papers are published, providing an additional avenue for disseminating research.

**Inspiration and Motivation:** Being surrounded by fellow scientists and hearing about their work can be inspiring and motivating for researchers. It can reignite passion and enthusiasm for their own projects.

**Promotion of Interdisciplinary Research:** Conventions often bring together experts from various sub-disciplines within a broader field, fostering opportunities for interdisciplinary collaboration and innovation.

**Public Engagement:** Some conventions include sessions or events that aim to communicate scientific knowledge to the general public, helping to bridge the gap between scientists and the wider community.

**Recognition and Awards:** Conventions may include award ceremonies to recognize outstanding contributions to the field, which can be a significant honor for researchers.

**Networking:** Conventions offer opportunities for networking and building professional relationships. This can lead to future collaborations, joint research projects, and access to resources and expertise.

Overall, science conventions play a crucial role in advancing knowledge, promoting collaboration, and facilitating the exchange of ideas within the scientific community. They contribute to the growth and development of various scientific disciplines.

### 17.7 THREE PRINCIPLES OF USEFULNESS

The "Three Principles of Usefulness" is a phrase that could refer to various contexts, depending on the specific field or topic it is applied to. The "Three Principles of Usefulness" was introduced by the Indian scientist and philosopher C. V. Raman, who was awarded the Nobel Prize in Physics in 1930 for his work on the scattering of light and the discovery of the Raman Effect. These principles reflect Raman's perspective on the role and purpose of scientific research. Raman, a renowned Indian physicist, was deeply committed to the idea that scientific research should be driven by a sense of social responsibility and ethical consideration. He believed that science should not only seek knowledge for its own sake but also contribute to the betterment of humanity and the preservation of the natural world. Without a specific context, there isn't a universally recognized set of "Three Principles of Usefulness" in a broad, general sense. Here are the three principles:

1. **The Principle of Universality/Relevance:** This principle asserts that scientific knowledge should be universally applicable and relevant. It means that scientific discoveries and advancements should have broad implications and benefits for humanity, rather than being limited to a specific context or application. Scientific research should address questions or problems that are of practical significance or have real-world applications. This principle ensures that resources and efforts are directed towards issues that matter to society.

1. 2.The Principle of Non-destructiveness/ Applicability: According to this principle, scientific research and innovation should not cause harm or destruction to the environment, society, or other fields of knowledge. It emphasizes the need for ethical and responsible conduct in scientific endeavors. Research should generate knowledge that can be applied to improve existing technologies, processes, or practices. This principle emphasizes the importance of practical outcomes from scientific endeavors.
2. 3.The Principle of Non-injury/Validity and Reliability: This principle emphasizes that scientific research should not cause harm to living beings. It encourages the pursuit of knowledge and innovation in a way that respects and safeguards the well-being of all forms of life. The research findings should be based on sound methodologies and produce results that are reproducible and reliable. This ensures that the knowledge generated is trustworthy and can be used with confidence.
3. Background and Significance: Raman's Three Principles of Usefulness reflect his vision for a scientifically informed and ethically conscious society. They advocate for the application of scientific knowledge for the greater good, while also emphasizing the importance of conducting research in a manner that is respectful of life and the environment. These principles continue to serve as an important ethical framework for scientists and researchers, reminding them of their responsibility to conduct research that benefits humanity without causing harm or destruction. They highlight the broader societal implications and responsibilities associated with scientific discovery and innovation. These principles collectively contribute to the effectiveness and impact of scientific endeavors, guiding researchers in their pursuit of knowledge and innovation for the betterment of society.

## 17.8 SUMMARY

The society that maintains traditional values desperately need scientific temperament. Two research works; Daniel Lerner's *The Passing of traditional Society* (1958), Wilbur Schramm's *Mass media and National Development* (1964) were influential for scientific thought and modernization of the traditional society. According to Lerner, transforming traditional societies into modern ones is essential for the overall development. Mass media becomes very important while communicating ideas and intends to change behavior of people right from developing awareness to adopt an innovation and scientific temperament. Mass media exposure is one of the four indicators Daniel Lerner has suggested for modernization apart from urbanization, literacy and political participation.

Jawaharlal Nehru believed that scientific temper would play a crucial role in the nation's socio-economic development. India is the first and only country to explicitly adopt scientific temper in its constitution. In the 42nd Amendment in 1976, Article 51 A(h) was added under the Fundamental Duties that states: It shall be the duty of every citizen of India to develop scientific temper, humanism and the spirit of inquiry and reform. In order to fulfil this fundamental duty, mass media could be very much useful for spreading practical science knowledge amongst people in their mother tongue. By this, we can also preserve the traditional values as well as local dialect.

## 17.9 TECHNICAL TERMS

**Scientific temperament:** It refers to a set of qualities, attitudes, and approaches that are essential for engaging with the world in a rational, evidence-based, and objective manner.



**Aspects of scientific temperament:** There are 12 important aspects of scientific temperament such as: Empirical Observation, Open-mindedness, Skepticism, Objectivity, Critical Thinking, Systematic Approach, Hypothesis Testing, Ethical Conduct, Continual Learning, Peer Review, Communication Skills and Humility.

**Science Conventions:** Science conventions are scientific conferences or symposiums or organized events where scientists, researchers, academics, and experts in a particular field come together to present and discuss their latest research findings, share knowledge, and engage in intellectual exchange.

**Three Principles of Usefulness:** It is a phrase that was introduced by the Indian scientist and philosopher C. V. Raman. The three principles of usefulness are: The principle of universality/ relevance, the principle of non-destructiveness/applicability and the principle of non-injury/ validity and reliability. It could refer to various contexts, depending on the specific field or topic it is applied to.

### 17.10 SELF-ASSESSMENT QUESTIONS

- 1) Define the concept of scientific temperament.
- 2) Who demonstrated early forms of scientific inquiry?
- 3) What are the key aspects of scientific temperament?
- 4) Why is scientific temperament so important?

### 17.11 SUGGESTED READINGS

1. Nehru, Jawaharlal (1946). *The Discovery of India*. Calcutta, India: The Signet Press. p. 453.
2. Hughes, Thomas (1893). "Anthropology: A historical Sketch". *The American Catholic Quarterly Review*. Vol. 18. Philadelphia: Hardy and Mahony. p. 627.
3. Russell, Bertrand. (n.d). *Free Thought and official propaganda*. [www.gutenberg.org](http://www.gutenberg.org).
4. Srinivasan, Venkataraghavan (2020, May 27). *Scientific temper: A Nehruvian thought that is much relevant today*. *The Federal*.
5. Bharti, Sunanda (2020, April 11). *Spirit of inquiry and the reform in the era of fake news*. *Times of India*. Retrieved 6 June 2021.

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## LESSON 18

# PRINCIPLES OF SCIENCE REPORTING

### OBJECTIVES

- To understand the concept of science reporting and need of creating awareness on science through different media outlets;
- To comprehend the essential tips and guidelines to be followed by the journalists in reporting science related content;
- To know the principles and key points for journalist to follow in reporting science for newspapers and magazines;
- To comprehend the essential principles of reporting science for radio;
- To know the principles of science reporting for audio video medium of television;

### Structure

- 18.1 Introduction**
- 18.2 Guidelines for science reporting**
- 18.3 Science Reporting for Newspaper and Magazine**
- 18.4 Principles of Science Reporting for Newspapers and Magazine**
- 18.5 Science Reporting for Radio**
- 18.6 Principles of Science Reporting for Radio**
- 18.7 Science Reporting for Television**
- 18.8 Principles Science Reporting for Television**
- 18.9 Summary**
- 18.10 Technical Terms**
- 18.11 Self-Assessment Questions**
- 18.12 Suggested Reading**

### 18.1 Introduction

Reporting, in a general sense, refers to the act of gathering and presenting information on a particular subject or event. It involves collecting facts, summarizing details, and conveying them to an audience through various media channels. Reporting is not limited to any specific field of knowledge or expertise but it covers a wide range of topics, including news and events of politics, economics, entertainment, sports, and more.

**Science journalism:** Science journalism is a specialized form of journalism predominantly covering issues such as science, medicine, and technology. The field typically involves interactions between science reporters, scientists and common people. Science journalist conveys reporting the scientific information to the people. Science reporting is a specialized form of reporting that focuses specifically on communicating scientific information, discoveries, and research findings to the public. It involves translating complex scientific concepts into accessible and understandable language. Science reporting is centred on topics related to scientific research, advancements, discoveries, and issues in various scientific disciplines, such as biology, physics, chemistry, medicine, environmental science, and more. The audience for science reporting includes both the general public and individuals

with an interest in science, but it often targets those who may not have a background in science. It aims to make scientific knowledge more accessible to a broader audience.

Science reporting can be found in various media outlets, including science-focused magazines, sections or special pages of newspapers, science television programs, science radio programs, science podcasts, science blogs, and online science news platforms. The primary objective of science reporting is to convey accurate and reliable scientific information in a clear, engaging, and informative manner. It helps bridge the gap between the scientific community and the general public, promoting scientific literacy and understanding. The practice of reporting on scientific discoveries and advancements has a long history, evolving alongside the growth of scientific knowledge and the development of mass media. It was professionalized in the second half of the 20th Century. In India, *Digdarshan* (means showing the direction), an educational monthly magazine that started publication in 1818 from Srirampur, Bengal carried articles on different aspects of science, such as plants, steam boat, etc. It was available in Bengali, Hindi and English languages.

World Editors Forum (2021) has suggested ten tips for journalists and media professionals for reporting science.

## **18.2 GUIDELINES FOR SCIENCE REPORTING**

1. Take all the time you can: Undertaking scientific journalism can be a difficult task – whether it be distilling a mountainous amount of research into a comprehensible piece of work for non-experts or simply wrestling with scientific terms and processes in order to develop an understanding of the study at hand. Hastily launching yourself into an article without observing due diligence risks the production of an error-ridden article, ripe for contradiction and rebuttal. It is vital that time and care be exercised when collating information and then, crucially, in the subsequent transposition of the data into the article. Producing quality articles and reports is the objective, therefore, rushing a story for the simple reason of beating a competitor to the punch is highly ill-advised.
2. Assure reasonable balance in the use of evidence: Acknowledging contradicting evidence and research is critical in order to avoid the pitfalls of presenting a biased article. You should weigh the merits of the science behind both sides of an issue before delving into the writing phase. This does not mean you need to give air to misinformation or junk science, but you should invest time comparing your research to the dominant scientific consensus and then make a considered judgement on how/if you will present the information.
3. Interrogate the credibility and quality of science: Given the disparity that exists in the quality of scientific research across different fields, it is imperative when sourcing scientific studies for use in your article that you factor in the credibility and quality of the work in question. Renowned scientists develop notoriety in their field through the mastery of processes, methodologies and the presentation of sound conclusions. It is advisable to avoid the use of studies that haven't been peer-reviewed so as to avoid the potential inclusion of specious scientific studies.
4. Cross-check facts: It is equally as important to ascertain that the facts used in your article correspond with the data presented in the studies which you have consulted. Develop relationships with scientists, who you can call upon to help you verify and fact-check information.

5. Don't overstate the outcome of the research: While producing widely-viewed, well-received articles is an objective for all journalists, this should not come at the cost of the reader. All efforts should be made to mitigate the temptation to overstate or overexaggerate findings from a study in order to sell a story. Ensure you understand what terms like "statistical significance" actually mean. Overstating conclusions or outcomes from a scientific study in your work risks misleading the public on what could be a serious topic, polarising an emerging/existing debate on a public health issue etc.
6. Don't mislead with statistics: Numerical figures are often the most accessible, eye-grabbing and quickest way for people reading articles to grasp a sense of just how grave, or on the contrary, meagre a reported issue may be. It is necessary that caution is taken when introducing percentages so as not to inflate the significance of the figure in the context of the story. Accurately report risk by explaining it in relative rather than total terms and be cautious of p-hacking. P hacking is a set of statistical decisions and methodology choices during research that artificially produces statistically significant results.
7. Confer with experts in the field: In the event that you are yet to earn a PhD in Molecular Biology, it is highly advisable that you confer with experts in the field about their findings, studies that you have consulted, and in a wider sense, the state of play in the relative field. Renowned experts are capable of providing useful insights and commentary on research papers, to which you may otherwise never have been exposed. Therefore, seeking expert advice on a particular paper will ultimately serve to strengthen your foundations and understanding of a particular issue, which allow you to rigorously, and more importantly, critically engage with the issue.
8. Share original research: While you may provide a comprehensive picture for the reader about a reported issue, it is advisable that you divulge a link to the full study, in order for interested individuals to gain further insight into the reported topic.
9. Clarity is key: For the most part, it is to be expected that members of the public are not as informed about the intricacies of different sciences. It is your job to communicate pressing issues of public interest as clearly as possible. It therefore advisable that you do not excessively indulge in the use of scientific terminology and concepts in your piece.
10. Add life to the article: It is imperative that you captivate the reader by providing an accessible, thought-provoking piece without compromising your article. Accordingly, it is incumbent upon you to communicate the key message of the research, in such a way, that simultaneously allows the reader to enjoy the experience of engaging with the article.

### **18.3 SCIENCE REPORTING FOR NEWSPAPER AND MAGAZINE**

Science reporting for newspapers and magazines involves the process of gathering, synthesizing, and presenting scientific information, discoveries and development in a format suitable for print publications. It requires translating complex scientific concepts into accessible and understandable language, accompanied by informative visuals and engaging storytelling techniques.

**Emergence of Print Media:** The dissemination of scientific knowledge to the public began with the advent of print media, particularly newspapers and magazines, in the 17th and

18th centuries. Early publications included scientific articles and essays have created a scientific temperament among the people.

**Popular Science Journals:** In the 19th century, the popularity of science grew, leading to the emergence of dedicated popular science journals and magazines. These publications aimed to make scientific content more accessible to a wider audience.

**Role of Science Journalists:** The profession of science journalism became more established in the 20th century. Science journalists are individuals with a background in both science and journalism, tasked with translating complex scientific information from English and original languages to local and regional languages for the general public.

**Technological Advancements:** The development of radio and television in the early to mid-20th century provided new platforms for science reporting, allowing for audiovisual presentations of scientific content. Technological advancements, such as improved printing techniques and the widespread availability of newspapers and magazines, facilitated the dissemination of scientific knowledge to a broader audience.

**Illustrations and Visuals:** Newspapers and magazines have utilized illustrations, photographs, diagrams, and charts to accompany science reports, providing visual aids to enhance reader comprehension.

**Diverse Range of Topics:** Science reporting in newspapers and magazines covers a wide range of scientific disciplines, including physics, chemistry, biology, medicine, environmental science, space exploration, and more.

**Digital Age and Online Reporting:** The rise of the internet and digital media in the late 20th and early 21st centuries revolutionized science reporting. Online platforms, including websites, blogs, and social media, provided immediate and global access to scientific information. While digital media has become increasingly prominent, newspapers and magazines continue to be important platforms for science reporting. Many publications have also transitioned to online formats to reach wider audiences.

**Diversity of Platforms:** Today, science reporting encompasses a wide range of media, including traditional print publications, television programs, radio broadcasts, podcasts, online articles, videos, and social media posts.

**Challenges and Opportunities:** Science reporting faces challenges such as ensuring accuracy, avoiding sensationalism, and addressing public trust in science. However, it also offers opportunities to engage the public in discussions about scientific issues and inspire interest in the natural world.

**Interdisciplinary Reporting:** As scientific knowledge becomes increasingly specialized and interdisciplinary. Science reporting plays a crucial role in synthesizing information from multiple fields to provide a comprehensive understanding of complex topics.

**Audience Engagement:** Effective science reporting in print media aims to engage the reader through clear, concise writing, compelling headlines, and relevant content that addresses the interests and concerns of the audience.

**Educational Value:** Science reporting in newspapers and magazines serves an educational purpose, helping readers stay informed about scientific advancements, breakthroughs, and the impact of science on society.

**Ethical Considerations:** Ethical considerations in science reporting include the responsibility to accurately represent scientific findings, provide proper attribution to researchers, and avoid conflicts of interest or biases.

Science reporting plays a vital role in bridging the gap between the scientific community and the general public. It serves as a conduit for sharing knowledge, fostering scientific literacy, and promoting informed discussions about important scientific issues. Overall, science reporting in newspapers and magazines plays a crucial role in disseminating scientific knowledge, fostering scientific literacy, and promoting informed discussions about important scientific issues within the broader public sphere. Here are some tips and considerations for effective science reporting in newspapers and magazines:

#### **18.4. PRINCIPLES OF SCIENCE REPORTING FOR NEWSPAPERS AND MAGAZINE**

- a) **Clear and Concise Language:** Use plain language and avoid technical jargon as much as possible. Explain complex concepts in a way that is easily understood by a common readers/general audience.
- b) **Start with a Strong Headline:** Craft a compelling headline that succinctly conveys the main point or significance of the scientific topic. It should grab the reader's attention and entice them to read further.
- c) **Provide Context:** Offer background information to help readers understand the relevance and importance of the scientific topic. Explain why it matters and how it may impact their lives or society.
- d) **Focus on the Main Message:** Clearly communicate the key takeaway or main finding of the scientific research. Avoid unnecessary technical details that may overwhelm or confuse readers.
- e) **Use Quotes and Expert Opinions:** Include quotes from scientists, researchers, or experts in the field to provide authoritative perspectives and insights. These quotes add credibility to the report.
- f) **Incorporate Visuals:** Include images, diagrams, charts, and info graphics to illustrate key points and make the information more visually appealing and understandable.
- g) **Provide Credible Sources:** Clearly cite the sources of information, including the names of researchers, institutions, and the publication where the original research was published.
- h) **Avoid Sensationalism:** Present the scientific information objectively and accurately. Avoid exaggeration or sensationalism, and stick to the facts.
- i) **Explain the Methodology:** Briefly describe the research methods used in the study to give readers an understanding of how the conclusions were reached.
- j) **Address Potential Implications:** Discuss any potential implications or applications of the scientific findings. This could include how the research may impact industry, healthcare, or public policy.

k) **Include Human Interest Elements:** Incorporate personal stories or anecdotes of individuals affected by the scientific topic to humanize the content and make it relatable.

l) **Proofread and Fact-check:** Ensure that the information presented is accurate and free of errors. Fact-checking is crucial in maintaining credibility.

m) **Use Subheadings and Sections:** Organize the report with clear subheadings or sections to help readers navigate through the information and find specific details of interest.

n) **Offer Additional Resources:** Provide references or links for readers who want to explore the topic further. This could include links to the original research paper or additional readings.

o) **Engage the Reader:** Encourage reader engagement by posing questions, inviting comments, or suggesting further lines of inquiry related to the scientific topic.

By following these guidelines, science reporting for newspapers and magazines can effectively communicate complex scientific information to a broad readership, promoting scientific literacy and understanding.

## 18.5 SCIENCE REPORTING FOR RADIO

Radio even in digital era is enjoying a renaissance due to the take up of digital radio, and most broadcasters include science in their programmes and general news. Radio can bring together science and society. Radio is more instantaneous than print, more ubiquitous than the web and more intimate and interactive than television. Huge amount of debates and the discourse between scientists and the public is played out in radio.

Science reporting for radio involves the effective communication and scientific information in an engaging and understandable manner for a radio audience. For this, we can use certain methods such as coverage of science conferences, new ways of using the web to make audio material available and to interact with the audience, the use of phone-ins, the use of games and quiz to increase the public's participation, etc. Apart from regional and national science issues, promoting a more international approach to science programmes is important. In multi-lingual nations like India, the language barrier is the main reason for less coverage of science content on radio. Translation would necessarily be used for science programmes.

Many programs, in particular documentaries and detailed reportages, often need the sounds of science to give colour and impact to what they are communicating. An archive of these sounds would be an interesting and useful tool. Research institutes should be encouraged to provide radio journalists with audio files, in the same way as photographic material, which press offices or researchers regularly provide for the media.

Here are some tips and considerations for science reporting on radio.

## 18.6 PRINCIPLES OF SCIENCE REPORTING FOR RADIO

a) **Know Your Audience:** Understand the demographics and interests of your radio audience. Tailor your content to match their level of scientific knowledge and curiosity.

b) **Clear and Concise Language:** Use plain language and avoid jargon. Explain complex concepts in simple terms to ensure that your audience can follow along.

c) **Engaging Storytelling:** Use storytelling techniques to make scientific topics relatable and captivating. Create a narrative that draws listeners in and helps them connect with the subject matter.

- d) **Start with a Hook:** Begin your report with an intriguing fact, a thought-provoking question, or a compelling anecdote to grab the listener's attention.
- e) **Provide Context:** Explain why the scientific topic is relevant or important. Help listeners understand how it impacts their lives or the world around them.
- f) **Incorporate Sound Effects and Interviews:** Use sound effects, ambient noises, and actualities (recorded voices or sounds from relevant events) to add depth and realism to your report. Include interviews with scientists, experts, or people affected by the topic.
- g) **Visual Descriptions:** Paint a vivid picture with your words, especially when describing visual aspects of a scientific phenomenon or experiment.
- h) **Use Analogies:** Compare complex scientific concepts to familiar objects or experiences to help listeners grasp the idea. Analogies can make abstract ideas more concrete.
- i) **Provide Evidence and Sources:** Back up your information with credible sources and data. Mention the studies, research papers, or experts that support the information you're presenting.
- j) **Avoid Sensationalism:** Present information objectively and avoid exaggeration or sensationalism. Stick to the facts and provide balanced perspectives.
- k) **Interactive Elements:** Incorporate interactive elements like quizzes, polls, or listener questions to engage your audience and make them feel involved in the reporting process.
- l) **Follow Ethical Guidelines:** Ensure accuracy and honesty in your reporting. Fact-check your information and attribute sources appropriately.
- m) **Stay Updated:** Keep abreast of the latest scientific discoveries and developments. This allows you to report on timely and relevant topics.
- n) **Practice and Rehearse:** Practice your script and delivery to ensure a smooth and engaging presentation. Pay attention to pacing, tone, and emphasis.
- o) **Encourage Further Exploration:** Provide resources for listeners who want to learn more about the topic, such as recommended books, websites, or contact information for experts.
- By following these tips, you can create informative and engaging science reports for radio that effectively convey complex information to a broad audience.

## 18.7 SCIENCE REPORTING FOR TELEVISION

Science reporting for television refers to the process of creating and presenting televised content that communicates scientific information, discoveries, and developments to a wide audience. It involves the presentation of scientific information in a visual and engaging format suitable for a television audience. The history of science reporting for television is closely tied to the development of both science communication and television broadcasting. Here are some key points in the background of science reporting for television:

**Emergence of Television:** Television technology began to emerge in the early 20th century, but it gained widespread popularity and accessibility in the mid-20th century. This allowed for the transmission of visual content to a large audience.

**Educational Programs:** Early television programming include educational content, and some of the first science-related shows focused on conveying scientific knowledge to viewers. These programs often featured experts and demonstrations.

**Public Interest in Science:** The mid-20th century saw a surge in public interest in science, spurred by major scientific achievements such as the space race and discoveries in fields like biology and physics. Television played a crucial role in disseminating information about these developments.



**Science Documentaries and Series:** Television networks began producing science documentaries and series dedicated to exploring various scientific topics. These programs ranged from nature documentaries to shows about space exploration and medical advancements.

**Visual Effects and Technology:** Advances in television technology, such as color broadcasting and improved visual effects, enhanced the ability to present scientific content in an engaging and visually appealing manner.

**Educational Television Networks:** Educational television networks, such as PBS (Public Broadcasting Service) in the United States and Government controlled Doordarshan (now Prasarbharathi) in India played a significant role in producing and broadcasting science-related content. These networks continue to be important platforms for science reporting on television.

**Diversity of Formats:** Science reporting on television encompasses various formats, including documentaries, news segments, educational programs, talk shows, and even science fiction series that incorporate scientific themes.

**Digital Age and Online Streaming:** In recent decades, the rise of digital technology and online streaming platforms has expanded the reach and accessibility of science reporting. Viewers can now access science-related content on-demand through streaming services.

**Global Impact:** Science reporting on television has a global impact, with programs and documentaries being broadcast and shared internationally. This helps to disseminate scientific knowledge on a worldwide scale.

**Advances in Visual Effects and Graphics:** Modern television technology allows for sophisticated visual effects, animations, and computer-generated graphics, enabling even more engaging and informative presentations of scientific topics.

Science reporting for television continues to play a crucial role in promoting scientific literacy and understanding among the general public. It serves as a valuable platform for communicating complex scientific concepts, discoveries, and their broader implications. Here are the tips and guidelines for effective science reporting on television.

## **18.8 PRINCIPLES OF SCIENCE REPORTING FOR TELEVISION**

- a) **Visual Storytelling:** Use visuals, such as images, diagrams, animations, and video clips, to illustrate key concepts and enhance the audience's understanding of the scientific topic.
- b) **Engaging Introductions:** Start with a compelling hook or visual element to grab the viewer's attention and draw them into the story.
- c) **Clear and Concise Language:** Use simple, jargon-free language to explain complex scientific concepts. Avoid technical terms that may be unfamiliar to a general audience.
- d) **Narrative Structure:** Organize the report in a clear and logical sequence, with a beginning, middle, and end. Guide the viewer through the story, building up to the main point or conclusion.

- e) **Expert Interviews:** Include interviews with scientists, researchers, or experts in the field to provide authoritative perspectives and insights. Use their explanations to complement and reinforce the information presented.
- f) **Demonstrations and Experiments:** Conduct live demonstrations or show pre-recorded experiments to visually demonstrate scientific principles and engage the audience.
- g) **Visual Effects and Graphics:** Use on-screen graphics, overlays, and visual effects to highlight key points, data, and statistics. These elements can enhance the viewer's comprehension.
- h) **Engage the Senses:** Incorporate sound effects, ambient noise, and music where appropriate to create an immersive experience and evoke emotions related to the scientific topic.
- i) **Real-world Applications:** Show how scientific concepts have practical applications in everyday life or in solving real-world problems. Help viewers see the relevance and impact of the information.
- j) **Case Studies and Examples:** Provide specific examples or case studies to illustrate the broader implications of the scientific topic. Use relatable scenarios that the audience can connect with.
- k) **Human Interest Stories:** Include personal anecdotes, experiences, or stories of individuals affected by the scientific topic. Humanizing the content can make it more relatable and emotionally resonant.
- l) **Interactive Elements:** Incorporate elements like quizzes, polls, or visual aids that encourage viewer engagement and participation.
- m) **Ethical Considerations:** Address any ethical or societal implications of the scientific topic, and ensure that these aspects are presented in a balanced and thoughtful manner.
- n) **Summarize and Recap:** Provide a concise summary or recap at the end of the report to reinforce the key takeaways for the viewer.
- o) **Encourage Further Exploration:** Direct viewers to additional resources, websites, or experts for those who want to delve deeper into the scientific topic.

By combining compelling visuals, clear explanations, and engaging storytelling techniques, science reporting for television can effectively convey complex scientific information to a broad audience.

## 18.9 SUMMARY

The aim of a science journalist is to render very detailed, specific, and often jargon-laden information produced by scientists into a form that non-scientists or common person can understand and appreciate while still communicating the information accurately. News coverage on science by traditional media outlets, such as newspapers, magazines, radio and news broadcasts are being replaced by online sources. For instance, the New York Times was awarded two Pulitzer Prizes for content published by Politico and The Huffington Post (now HuffPost) both online sources in April 2012. It is a sign of the platform shift by the media outlet. In order to retain the significance of traditional media, Newspapers may publish science related news on particular page/s on daily basis so that readers could easily identify the science content. Similarly, Governments should take measures issuing guidelines to all Television, Radio and FM Radio channels, operated by private and public managements and make it mandatory to allot a time slot for broadcasting science programs regularly. Updating

the state media policy according to the scientific needs of the media consumers and also to promote scientific temperament among the people help to the development of nation.

### 18.10 TECHNICAL TERMS

**Science journalism:** It is a specialized form of journalism predominantly covering issues such as science, medicine, and technology. The field typically involves interactions between science reporters, scientists and common people.

**Science reporting:** Science reporting is a specialized form of reporting that focuses specifically on communicating scientific information, discoveries, and research findings to the public. It involves translating complex scientific concepts into accessible and understandable language. Science journalist conveys reporting the scientific information to the people.

**Science reporting for newspapers/Magazines:** Science reporting for newspapers and magazines involves the process of gathering, synthesizing, and presenting scientific information, discoveries and development in a format suitable for print publications.

**Science reporting for radio:** It involves the effective communication and scientific information in an engaging and understandable manner for a radio audience by using methods such as coverage of science conferences, new ways of using the web to make audio material available and to interact with the audience, the use of phone-ins, the use of games and quiz to increase the public's participation, etc.

**Science reporting for television:** It refers to the process of creating and presenting televised content that communicates scientific information, discoveries, and developments to a wide audience. It involves the presentation of scientific information in a visual and engaging format suitable for a television audience.

### 18.11 SELF-ASSESSMENT QUESTIONS

- 1) Define the concept of scientific reporting.
- 2) What are the key aspects of science reporting for newspapers and magazines?
- 3) Elucidate the principles of science reporting for newspapers/magazines?
- 4) What are the principles of science reporting for radio?
- 5) Explain the key aspects of science reporting for Television?
- 6) What are the principles of science reporting for Television?
- 7) What is the importance of science journalism in the age of 21st century?

### 18.12 SUGGESTED READINGS

1. ANU(n.d).ScienceReportWritingVideo[Online].Retrievedfrom<https://www.anu.edu.au/students/academic-skills/writing>
2. Burkett, D.W. (1973). Writing Science News for the Mass Media, Gulf Publishing Company, Redas, Texas, USA
3. CORDIS (2011, April 14). Science in radio broadcasting. Cordis.europa.eu European Commission research results [Online] Retrieved from <https://cordis.europa.eu/project>
4. World Editors Forum. (2021). Ten Tips for reporting Science. Science in the Newsroom. [Online] Retrieved from <https://scienceinthenewsroom.org/resources/10-tips-for-reporting-science>.

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## LESSON 19

# HEALTH COMMUNICATION AND MEDICINE

### Objectives

- To know the origin of health communication and how it had been progressing;
- To expose various issues, challenges and concerns in health communication;
- To train the students to design communication strategies for imparting information and health awareness among people.
- To strengthen the student to apply communication strategies for health communication after understanding the diversity of the region and its needs.
- To comprehend the essential tips of using medicine for day to day health problems.
- To know about the barriers of communication in health care related issues;
- To understand media advocacy and know about the health communication campaign;

### Structure

- 19.1 Introduction**
- 19.2 Origin of Health Communication**
- 19.3 Interpersonal health communication**
- 19.4 Health care communication**
- 19.5 Barriers of Health Care Communication**
- 19.6 Strategic Communication in Health**
- 19.7 Media Advocacy and Health Communication Campaign**
- 19.8 Summary**
- 19.9 Technical Terms**
- 19.10 Self-Assessment Questions**
- 19.11 Suggested Reading**

### 19.1 INTRODUCTION

Mass communication is used to change public opinion in general and to promote beneficial changes in behavior among members of populations. Studies have established that the communication processes are central to empowering communities through which individuals are able to arrive at their own understanding of the given issues, to consider and discuss ideas, to innovate, to negotiate and to engage in public debates at community and the national levels. The idea of health and the emphasis of health information is at the core of all of the communication processes.

Health communication has been a part of development communication for decades. The goal of health communication is to identify and provide better and more effective communication strategies that will improve the overall health of society. The area of health communication surrounds the development of effective messages about health, the dissemination of health-related information through various mass media outlets such as broadcast, print, electronic and internet supported online and social media. United Nations Development Programme (UNDP) set 17 Sustainable Development Goals (SDGs) for the world countries, targeting by 2030 and one of the goals is to achieve significant progress on global health, medicine and control diseases and pandemics.

**What is Health Communication?:** Renata Schiavo (2013), defined health communication as a multifaceted and multidisciplinary field of research, theory, and practice concerned with reaching different populations and groups to exchange health-related information, ideas, and methods in order to influence, engage, empower, and support individuals, communities, health-care professionals, patients, policymakers, organizations, special groups, and the public so that they will champion, introduce, adopt, or sustain a health or social behavior, practice, or policy that will ultimately improve individual, community, and public health outcomes.

## 19.2 ORIGIN OF HEALTH COMMUNICATION

The term Health Communications was used in 1961 when the National Health Council (NHC), a nonprofit association of health organizations in USA, organized a National Health Forum to discuss challenges faced in the communications of health information (Helen, 1962). The term was used again in a conference on health communication in 1962 when Surgeon General Luther Terry organized to discuss how various techniques can make health information available to the public. The term was adopted by members of an interest group at International Communication Association (ICA) in 1975.

In the past nearly four decades, health communication has evolved from Information, Education and Communication (IEC) to Behaviour Change Communication (BCC) to Social and Behavioural Change Communication (SBCC) and now, more recently, RCCE, that is, Risk Communication and Community Engagement. IEC, as it was usually practiced, focused on delivering information to a target, with an inherent assumption that subsequent to delivering accurate information, people would reduce their damaging or harmful behaviour's, and thus, adopt desired positive behaviours. Proponents of the BCC acknowledged that information is necessary but not sufficient in most cases. BCC uses context-specific formative research to determine the motivators, barriers and facilitators to behavioural change, and it responds with a variety of techniques designed to incite the individuals to change their behaviour.

## 19.3 INTERPERSONAL HEALTH COMMUNICATION

The interpersonal relationship in health communities plays a pivotal role predominantly in developing countries. Health communication relies on strong interpersonal communication in order to influence health decisions and behaviours. The most important of these relationships are the connection and interaction between an individual and their health care providers, such as physician, therapist, pharmacist and compounders. Interpersonal communication among an individual's social support system such as family members, relatives, friends and community members is crucial. These connections can positively influence the individual's decision to make healthy choices. Patients are more prone to listen when they feel invested emotionally into the situation. If they feel as if they understand what is being said, they are more prone to make objective decisions based on the information heard.

Two of the most prominent areas of study in interpersonal health communication are; The Patient-Centred Care and the Relationship-Centred Care Models. Patient-Centred Care is a practice model that emphasizes the needs and preferences of the patient to provide the best possible care. Associated with higher patient satisfaction, improved outcomes, and enhanced

communication. The Patient-Centred Care (PCC) model is a popular evidence-based approach to healthcare, no matter your modality or specialty. Relationship-Centred Care (RCC) model is a framework for conceptualizing health care which recognizes that the nature and quality of relationships in health care influence the process and outcomes of health care.

#### 19.4 HEALTH CARE COMMUNICATION

Communication in health and medicine is a critical aspect of patient care, research, education, and policy-making. Effective communication ensures that information is accurately conveyed, understood, and acted upon. Effective communication in health care can make a difference between saving life and escaping from death. Health administrators and other healthcare professionals can benefit from learning more about types of communication in health care, barriers to communication in health care and evidence-based strategies for effective communication in health care today.

Skillful communication is essential to health care. Clear, honest communication between patient and provider paves the way for accurate diagnoses and treatment decisions. Similarly, clear, confidential communication between members of a care team (which often includes patients and multiple providers) results in swiftly and ethically delivered care without breaching confidentiality. Providers can help patients feel heard, ease their fears, and encourage them to disclose relevant information. Every person deserves to understand the medical care they receive. That means that healthcare organizations may need to do better to train and hire interpreters so that patients can give their informed consent to treatment.

Healthcare leaders understand that effective communication in healthcare organizations starts with recognizing the importance of listening to one another. Collectively, medical professionals have a wealth of knowledge and expertise. That wellspring goes untapped when providers rush from one appointment to the next without allowing themselves time to listen and communicate effectively with patients, when patients feel unsafe, when care teams store medical information improperly, or when health organizations fail to employ interpreters for cross-cultural communications.

#### 19.5 BARRIERS TO HEALTH CARE COMMUNICATION

Though communication is foundational to the healthcare system, it's often problematic.

***Fake news in health communication:*** A major criticism of the use of mass media as a method of health communication is the unfortunate ability for false and misinformed messages to spread quickly through the mass media, before they have the chance to be disputed by professionals. This issue may generate unwarranted panic amongst those who receive the messages and be an issue as technology continues to advance. An example of this may be observed in the ongoing distrust of vaccinations due to the publication of numerous messages that wrongly link the childhood measles-mumps-rubella, vaccination with the development and onset of Autism. The speed with which this message spread due to new social networking technologies caused many parents to distrust vaccinations and therefore forgo having their children receive the vaccine. Although this panic is based on false information, many still harbor a lingering suspicion towards vaccinations and refuse them, which has caused a public health concern.

Professionals in this field can take steps to overcome many common barriers to effective communication in health care. For instance, patient distrust and discomfort. Patients may not feel comfortable disclosing sensitive information, such as substance misuse or sexual dysfunction, to their care providers. Patients withhold medical information for many reasons. Therefore, strategic communication may help in improving health.

## 19.6 STRATEGIC COMMUNICATION IN HEALTH

Communication, as a stream of academic study and practice, especially as it further evolved to 'strategic communication', is vital for human health and development. The central government largely invested in the health promotion and health awareness activities that were mono-linear and information-based models. Therefore, most countries were found tilting to perpetuate the top-down use of mass media and mid-media tools and did not adequately appreciate the potential of participatory and community-based media. However, through evolving communication research, it became clear that members of the public were not mere passive recipients of information, and that mass media alone could not change people's perceptions, mindsets and behavior's, especially so when the desired outcomes address core health and development practices, including the risk factors surrounding any given disease control or pandemic strategies.

**Strategies for Effective Health Communication:** To overcome the many barriers to effective health communication, following are the suggestions:

- **Be Humble:** Studies show that when a patient and their health provider are seated during office visits and hospital check-ins, the two parties can build trust more easily.
- **Ask open-ended questions:** Patients often feel uncomfortable voicing their concerns, even after a few minutes of empathetic conversation. Communication in health care gets easier when we all ask questions and prepare to listen. Doctors and other care providers should ask whether patients have more to say. Ask patients like "Is there something else you'd like to talk about the problem? The "BATHE" technique guides providers to ask patients questions that solicit more information and develop rapport. BATHE: Background - "What is going on in your life?", Affect - "How is it affecting you?", Trouble "What troubles you most about the situation?", Handling - "How have you been handling this so far?", Empathy - Show patients you are listening and saying about their feelings "That sounds frustrating/confusing/difficult/satisfying, etc."
- **Speak in Plain Language:** Patients often have difficulty communicating needs or symptoms when their provider does not speak their language or when the healthcare organization has not supplied an interpreter. Providers should avoid medical jargon, where possible, and instead rely on plain language to communicate with patients. Use clear and concise/plain language that is easy for patients and non-experts to understand.
- **Active Listening:** Give full attention to the person speaking, allowing them to express themselves fully. Ask clarifying questions to ensure you understand their concerns or information.
- **Empathy and Compassion:** Show empathy and compassion towards patients, acknowledging their feelings and concerns. Create a supportive and non-judgmental environment.
- **Non-Verbal Communication:** Pay attention to body language, facial expressions, and tone of voice. These can convey emotions and attitudes.

- **Cultural Sensitivity:** Recognize and respect cultural differences in communication styles, beliefs, and practices. Be aware of potential language barriers and provide appropriate resources or interpreters.
- **Informed Consent:** Clearly explain procedures, risks, and benefits to patients, and ensure they have the opportunity to ask questions. Document consent in a clear and understandable manner.
- **Health Literacy:** Assess and address the level of health literacy of the audience, tailoring communication accordingly. Provide educational materials in multiple formats (e.g., written, visual, audio).
- **Inter-professional Communication:** Collaborate effectively with other healthcare professionals, including physicians, nurses, pharmacists, and therapists. Share important patient information accurately and in a timely manner.
- **Digital Communication:** Utilize technology for telemedicine, electronic health records, and patient portals to facilitate communication. Ensure the privacy and security of electronic communications in compliance with healthcare regulations.
- **Patient Education:** Provide patients with clear instructions, educational materials, and resources to empower them in managing their own health. Encourage questions and address any misunderstandings.
- **Crisis Communication:** In times of crisis or emergencies, provide timely and accurate information to the public, patients, and healthcare providers. Use multiple channels (e.g., websites, social media, press releases) to disseminate information.
- **Ethical Communication:** Maintain patient confidentiality and adhere to ethical guidelines when discussing sensitive information. Respect patient autonomy and preferences in decision-making.
- **Feedback and Continuous Improvement:** Seek feedback from patients, colleagues, and team members to improve communication skills and practices. Stay updated on best practices in healthcare communication through professional development and training.

## 19.7 MEDIA ADVOCACY AND HEALTH COMMUNICATION CAMPAIGN

Media advocacy is the process of disseminating policy-related information through the communications media, especially where the aim is to effect action, a change of policy, or to alter the public's view of an issues. As technologies expands, the platforms for health communication through media advocacy certainly expanded as well. Media advocacy use strategic mass media tools combined with widespread organization in order to advocate for healthy public policies or lifestyles. This can include the use of print, audio and video, online and social media platforms to spread messages to promote health information to a wide-ranging audience.

Health communication campaigns tend to organize the message for a diverse audience. Campaigns are the effective method for spreading message of public health in endorsing prevention of disease like HIV/AIDS and in general health promotion and wellness like family planning. Scholars of health communication emphasize the importance of strategic planning throughout a campaign. This includes a variety of steps to ensure a well-developed message is being communicated:

1. Reviewing background information to define what the problem is and who is affected by the problem.
2. Setting communication objectives and proposing a plan to meet the wanted outcome.



3. Analyse the target audience by determining interests, attitudes, behaviours, benefits, and barriers.
4. Select channels and materials for communication in relation to what will most effectively reach audiences.
5. Develop and per test message concepts to determine understanding, acceptance, and reaction to the message
6. Implement communication with selected audience and monitor exposures and reactions to the message.
7. Ensure information is available in the language of intended audiences.
8. Assess the outcome and evaluate the effectiveness and impact of the campaign, noting if changes need to be made.

## 19.8 SUMMARY

Effective communication is a dynamic process that requires ongoing attention and effort. Skillful communication enables healthcare providers to establish rapport with their patients, solicit crucial health information, and work effectively with all members of a care team and the public. Tailoring the approach to the specific needs and circumstances of the individuals you are communicating with is essential for providing high-quality care in the field of health and medicine. Evidence-based strategies for communication in health care can keep communication streamlined. Even a few extra minutes of communication can result in more efficient healthcare delivery for all. Health care providers and administrators need to work hard to ensure that healthcare information stays confidential, accessible only to the necessary parties of a care team. Controlling how many individuals can access confidential patient information helps healthcare teams communicate accurately and clearly and limits misunderstandings or communication breakdowns.

## 19.9 TECHNICAL TERMS

**Health Communication:** A multifaceted and multidisciplinary field of research, theory, and practice concerned with reaching different populations and groups to exchange health-related information, ideas, and methods.

**Health care Communication:** Health care communication refers to effective communication in health care that can make a difference between saving life and escaping from death.

**Interpersonal health communication:** It refers to the relationships that are the connection and interaction between an individual and their health care providers, such as physician, therapist, pharmacist and compounders.

**Media advocacy:** It is the process of disseminating policy-related information through the communications media, especially where the aim is to effect action, a change of policy, or to alter the public's view of issues.

**Health communication campaigns:** Health campaigns are the effective method for spreading message of public health in endorsing prevention of diseases. It tends to organize the message for a diverse audience.

**19.10 SELF-ASSESSMENT QUESTIONS**

1. What does health communication mean?
2. Explain the origin of Health Communication.
3. How interpersonal health communication helps the people?
4. What is strategic communication and how it helps in resolving health related issues?
5. What do you know about health-care communication?
6. Define media advocacy and explain various steps for campaigning health communication.
7. What are the barriers to communication in health care?

**19.11 SUGGESTED READING**

1. Helen Neal (1962). better communications for better health. internet archive. the national health council.
2. Effective Communication for Health Professionals. (2019). Netherlands: Elsevier - Health Sciences Division.
3. Health Communication: A Multicultural Perspective. (2001). United Kingdom: SAGE Publications.
4. Kreps, G. L., Thornton, B. C. (1992). Health Communication: Theory & Practice. United States: Waveland Press.
5. Kreps, G. L., Thornton, B. C. (1992). Health Communication: Theory & Practice. United States: Waveland Press.
6. Narula, Uma (2019). Healthcare Communication in India: Contexts & Trends. Har-Anand Publication Private Limited
7. Parvanta, C., Harner, R., Nelson, D., Parvanta, S. (2010). Essentials of Public Health Communication. United Kingdom: Jones & Bartlett Learning.
8. Rice, R. E., & Atkin, C. K. (2000). Public communication campaigns (3rd ed.). Thousand Oaks, CA: Sage.
9. Schiavo, R. (2011). Health Communication: From Theory to Practice. Germany: Wiley.
10. Thornton, Barbara C., and Gary L. Kreps. (1992). Perspectives on health communication. Long Grove, IL: Waveland Press.
11. Thorson, D. E., Parker, D. J. C. (2009). Health Communication in the New Media Landscape. United Kingdom: Springer Publishing Company.

**Dr. K. John Babu**

**Model Question Paper**

**M.A. DEGREE EXAMINATION**

**Second Year**

**JOURNALISM AND MASS COMMUNICATION**

**Fourth Semester**

**Paper III - ENVIRONMENTAL AND SCIENCE COMMUNICATION**

**Time: Three hours  
marks**

**Maximum: 70**

**Answer ALL questions**

All questions carry equal marks. (5x14=70)

- 1 a. What are the main causes of Global Environmental issues?  
Or  
b. How globalization has impacted the environment human life and the living conditions of rural people in India.
2. a. What are the main causes of climate change?  
Or  
b . Explain the Purpose and Objectives of Public Participation in environmental Communication?
3. a. Analyse any two environmental issues in your area and its coverage of media?  
Or  
b. What the difference between Green marketing and corporate social responsibility .
4. a .Explain the history and present status of science communication in India .  
Or  
b . Elucidate the Duties and code of Conduct of Science Journalist?
5. a. ) Define the concept of scientific temperament.  
Or  
b Elucidate the principles of science reporting for newspapers/magazines.