UNIT-1 : BASICS AND HISTORY OF SCIENCE COMMUNICATION

UNIT STRUCTURE

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1.1 LEARNING OBJECTIVES

After thoroughly going through this unit, you shall be able to ---

- understand the emergence of modern science
- analyse the development of science journalism at international and national levels
- discuss the present-day trends in this direction
- explain the significance and need of science journalism in the modern day context

1.2 INTRODUCTION

In simple terms Science is the study of various aspects of the world and the universe in a scientific, rational and logical way where nothing is left to assumption. Rather, everything is established only after a series of thorough experiments and investigations applying established norms and standards. These scientific findings are applied for improvement of standard of living of people in all walks of life by utilizing them through improvised devices or systems for development of humanity. Hence, science is an integrally-important part of our life. These days, since the times of the emergence of modern educational system, there are so many institutions of academic and research-orientation. They are engaged in scientific studies being carried out into different innovative and futuristic areas of human beings. And, subsequently a very big storehouse of knowledge in all these and also many frontier areas have been accumulated over the decades. This would also remain so in the near as well as distant future. Now, unless these research findings are taken out of the laboratories and applied in real life for betterment of our life they would not have any proper value. Herein

lies the significance of science communication of which science journalism is a major component. That is because, for reaching out to the mass people at every level of the society across the world, it is one of the topmost convenient and reliable media. Thus, science journalism needs to be studied and practised in details for the cause of making the people aware of various developments in the field of science, thereby inculcating a sense of rational and logical lifestyle to the optimum possible extent. This is such an important activity that even the UNESCO has instituted the Kalinga Prize for Popularization of Science in 1952. The National Council for Science and Technology Communication (NCSTC), Government of India also awards several prizes in a few areas of science communication every year. The primary objective is to encourage people to adopt it and strive for converting maximum people oriented towards this aspect.

1.3 EMERGENCE OF MODERN SCIENCE

An article by a prominent researcher in this field in the British Journal of History of Science (BJHS) says that there has been divergent views about it. One school opines that it began in the high middle ages (1277 to be precise) or with 'via moderna' in the 14th century. Also, a more widespread view is that with the Italian Renaissance, it was the 're-birth' of the sciences. (Oxford University Press, January 5, 2009). Further, generally Copernicus is considered as the great science revolutionary and the scientific revolution is supposed to have taken place in the period of Copernicus to Newton. Another view is that science revolution took place in the 7th century from Galileo to Newton. You shall have to study various documents available in different sources in this regard to realize the significance of this revolution and emergence of modern day scientific knowledge base.

A very important and relevant point here is that this revolution has opened the ways people started looking at the various issues of life including the belief of the sun rotating around the earth, centrifugal force, healthy way of life based on a hygienic system etc. So, peoples' attitude also changed to a big extent. Industrial revolution, better health awareness, education, availability of knowledge in the form of books after invention of printing press, modern means of travel including aeroplanes, communication means like radio, TV and of late internet etc. have brought in a major ease in the living of life in the society.

However, even in today's time, a certain section of the global population live in 'not so hygienic' way, having biased viewpoints about basic truths of life etc. Hence, communicating the proper knowledge systems to this particular target audience is quite important. And here science journalism is the most important means of getting those messages to the right kind of people without major wastage of time and resources. Most of you have already experienced yourself how the country had to undertake the Swachchata Abhiyan a few years ago to inculcate the very basic aspect of cleanliness in our life.

Many dedicated people including scientists, researchers, health professionals have been engaged in furthering this cause since a long time now.

CHECK YOUR PROGRESS

Q.1 : Why does science need to be communicated ?

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Q.2 : Is there any connection between science and improvement of our living standard at all ? How ?

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Q.3 : How simple is it to find out the period of emergence of modern science ? Why ?

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Q.4 : What is science revolution ?

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Q.5 : What is the relation of Copernicus with science ?

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1.4 HISTORY OF SCIENCE JOURNALISM (GLOBAL CONTEXT)

An article in 'Nature' in June, 2009 says that science journalism began around 120 years ago. It started when in the absence of any proper science journalist, the famous science fiction writer HG Wells started the good work of writing newspaper articles on different aspects of science. Wells initiated writing several important science fiction contents like 'Time Machine'. He had launched a lot of efforts to develop "translation of scientists' jargons and use writing techniques to engage non-specialists (common people)." The same article also informs that in 1904 The New York Times appointed Carr Von Anda as a science journalist and he did a meticulous and commendable job during his tenure. In the 1930s and 40s, several science journalists supported by scientist-researchers made efforts for convincing the people in general that adoption of a scientific way of life would bring about a lot good for the society. It was in 1934 that the National Association of Science Writers (NASW) was formed in the USA. George W Gray of Time in 1937 opined that science journalism needed to inculcate awareness about making scientific methods an integral part of popular education and through it a universal element of civilized thinking" (Rensberger, 2009).

With such humble beginnings, the discipline started evolving properly to arrive at a matured status of late. Today, a good number of journals (like the Indian Journal of Science Communication), TV and Radio programmes, blogs are produced all over the world on various aspects of this discipline.

1.5 HISTORY OF SCIENCE JOURNALISM IN INDIA

India has a rich tradition of communicating scientific findings and aspects to the people in different ways since ancient times. The Vedas, samhitas and many other epic-like books can be termed as attempts to communicate various basics of knowledge to the mass people down the emerging ages. It is also true that many of these efforts need to be re-examined in terms of their relevance at the present day era. Yet during those times when they were conceived and prepared, they can be fine examples of communicating scientific principles to the masses. Cutting back to the modern times, it was Digdarshan, the first monthly magazine in Hindi, Bengali and English to have regular news items on science. Hence, this can be cited as the first modern science journalism initiative in our country. Similarly, the first newspaper in Assamese and the present North-Eastern Region of India – Orunodoi (launched in 1846), also a monthly, carried science news. Even though it declared itself as a newspaper dedicated for spreading of Christianity, it had contained science-related news items often.

Against this background, the current scenario of science journalism is not a very encouraging one. That is, there are quite a few proper science journals which are not aimed at the general public. But popular newspapers or magazines dedicated fully to this theme are very rare. It is a hard fact that for most of the newspapers and magazines, coverage of science-related issues is not exactly a priority. But, despite this, *The Hindu* dedicates a full page every week for coverage of some specific aspects of science and technology. Similarly, its sister publication *The Frontline* also publishes short items on latest development in this field in every issue of the fortnightly magazine.

At the same time, in spite of a not-so-encouraging scenario of science journalism in the country, several noteworthy efforts have been taken up continuously for promoting this aspect. For example, there is the Indian Science Communication Society (ISCOS), based at Lucknow since 1978. It has been organizing a training course in science journalism and science writing for interested people in this field. It has also been publishing a popular science magazine termed Indian Journal of Science Communication for about two decades. This journal has been disseminating various aspects of science to the people in a language that is simple and understandable to a large extent. Besides, many state-level voluntary associations of science have also been publishing journals and magazines in this direction. Science Reporter from VP is another example. Similarly, Bijnan Jeuti from Assam Science Society is one long-serving journal in this regard.

CHECK YOUR PROGRESS

Q.6 : When did science journalism emerge in the world and also in India ?

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Q.7 : Who was George W Gray ?

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Q.8 : Does any newspaper / magazine in our country have science communication contents on a regular basis ?

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Q.9 : Which organization in the voluntary sector provides science journalism course ?

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1.6 NEED AND SIGNIFICANCE OF SCIENCE COMMUNICATION

From the above discussions and from other sources, it can be concluded that science is the basis of life and also the primary requirement for maintaining a rational and logical standard of life in this world. Each and every step and walk of life needs a scientific basis for progressing towards a positive development. Hence, science is so important for our life. This includes both basic or physical sciences and social sciences and humanities. Here the basic question is – how would the people – the target audience of the communication receive the messages which are supposed to be empowering for their life. In other words who would act as the mediator between the sources of the science knowledge base and the masses.

So we need science journalism or communication for fulfilling this purpose.

A journalist or professional communicator interested in this field would need to go ahead with the following process for discharging his or her duties ---

- First of all they need to look for potential sources for news on science and related areas – new discoveries, their possible applications for uplift of human life or furthering knowledge,
- Develop a working relationship with the sources so that the latter can inform the former about these new developments
- Then prepare those findings or innovations in a language which is easily understandable to the common people
- Many a times when a crisis situation may arise in the society like the COVID19 pandemic, spread of 'false and mis – information', relevant sources in those areas would have to be contacted and request them to offer their voice or views and dispel the 'lack of truth' in that direction so that people can be empowered

These are the basic steps needed to be observed for communicating scientific news and information for the greater interests of the people.

Let us discuss a few examples which shall make the scenario a bit clearer. There is a provision of extension officers at Block Development Office level of the country for both agriculture and veterinary departments. The primary job of these officials is to reach out to the farmers at grassroots level. The idea is to make them aware of the latest development in these fields so that these can be adopted for better yield. Yet, how much of these efforts are actually happening in reality ? Similarly, if a Civil engineering department of an established educational institution has developed a new mechanism or technique for construction of a better building or house, that needs to be communicated to the people. As a result they can be adopted to develop a better construction for future.

Even in case of the COVID 19 situation there was a scope to make people aware of a solution of preparing sanitizers in a do-it-yourself manner at their homes only. That would have been highly helpful for people. Here also, science journalism can do a lot.

We can see that a good portion of people of the society usually do not like to adopt a new system or technology when it is introduced in the initial period. But it has also been found that this particular system or technique is productive and supportive of human efforts in that specific area. So, disseminating news and information and scientific developments of the world is indeed a primary job. But there is an urgent need also for picking up and publishing success stories in those areas. This is to ensure that those people who would not like to use or adopt them are encouraged to adopt the same and thereby make their life better.

At this point, the communicator also needs to keep in mind the language to be used for this purpose. This is because this language has to be understood by anyone and everyone as far as possible.

The issue is further made difficult by the fact that many a times or more often than not, an innovator or scientist or researcher is usually not a good communicator. Thus, the science journalist has to first

understand the basic principles or working system of the new findings or developments and then write in a common man's language for publication.

In this direction, preferably TV and Radio score better than print medium as the first two can show a demonstration of the new developments in a 'live' situation. This obviously can be more attractive as well as effective for human beings.

Besides, the following points need to be observed without fail while discharging their duties as a science journalist ---

* Facts and figures must be accurate and to-the-point. Otherwise this shall be equivalent to providing misleading information that may prove harmful at times

* Attribution or quoting of sources must be correct or a chaotic situation shall arise

* By developing a strong sense of observation and analytical power, a science journalist must be able to link different phenomena happening around the same time to something basic in the field of science and technology thereby making people aware about the root cause of this problem

Where to locate sources

A certain amount of home work is definitely necessary in this field in the initial period. That is – looking for recent science findings in different laboratories in and around the society or somewhere else. In this regard, the journalist concerned needs to keep one's eyes and ears open for any such possible news item in any media or source. Following that, one must try to access the websites of those organizations for further confirmation. This is a very positive development. That is, nowadays, any decent organization, whether engaged in academic research or stand-alone research activities must have a reasonably good website for showcasing many of their findings and areas of research. Even those engaged with Defence-related issues also do have websites by disclosing things to the extent possible for not compromising on their secret mandates. So, a proper study of the websites of such institutions and organizations would allow further details on many of those news items. Of course, the question of copyright and patent would also matter.

Thus, after getting a hint from a brief news item or a casual talk or conversation with scientists or other sources, the science journalist must decide whether it would be interesting or not. And more than interesting, whether it would be beneficial for the people in the short and long run. Your journalistic instinct or 'nose for news' capacity would also be highly helpful in this direction. Following this, there are mainly two choices. A science journalist can write a print medium news story or feature. Alternatively, prepare a TV / Radio news item from the already available facts and figures in those websites depending on the targeted audience. On the other hand, many a times these additional information may not be openly

available or accessible. In those cases, one can approach the officials of those institutions and request for a briefing from the right person – an authority in that particular area for an interview and scope for a broader news item.

It needs to be mentioned here that nowadays, the governments – both at the Centre (Delhi) and states are highly media savvy. Also, because of a popular dictate they want the public-funded organizations and institutions to publicise and open up their knowledge base for public viewing. The idea is to enable people to access them properly and take their due advantage whenever and whichever ways they can visualise.

Let us see these examples for such a purpose---

- The Indian Institute of Wildlife, Dehradun brings out a highly professional and exhaustive State of the Indian Forests Report every two years. This report is the ultimate authority in these matters and contains many useful information including increase and decrease in different types of forests cover in the country
- The websites of Bureau of Police Research and Development (BPRD) and National Crime Records Bureau (NCRB)provide some interesting records of crime and newer developments in the system of policing in the country. These can be used for making awareness among the people

These are just minuscule examples of institutions and organizations involved in science-related areas keeping their findings in the public domain for popular benefit.

It is not that the websites are the only good sources of any science news. These can also come under any source across institutions including academic ones like universities, colleges etc. which may not always be found on the website. Similarly, annual reports of these organizations, institutions are also other potential sources of science news.

1.7 **ITS IMPORTANCE IN PRESENT DAY CONTEXT**

The importance of science journalism for the society shall remain high for the foreseeable future. We can see that despite so much of advances in each and every area of science and technology, a good portion of the society all over the world still remains poorly aware of many of the developments in this field. But these aspects have the potential for safeguarding their lives and also improving their standard of living if some of these developments are adopted on a day-to-day basis.

The COVID19 pandemic has amply shown us one important aspect- the ground-level awareness of many of the people in the world is still at a lower level. Thus, they would not like to adopt any preventive measures like wearing of masks, maintaining social distance in public, taking vaccine etc.

At this point, science journalism is among one of the topmost effective methods or ways for informing people of the downside of those habits. This is because the goal and final responsibility of journalism and for that

matter any communication system or method does not end simply by delivering or disseminating information from all fields to the people. It is also the responsibility of those communication initiatives to influence the target audience. And as far as possible convert them to such an active awareness level that the people are compelled or driven to practice whatever is being disseminated to.

In other words, every communication effort, whether it is journalism, audio-visual programmes, blogs, podcasts, there should be only one end objective. That is - to empower the receivers of those information in such a way that they become empowered to practically utilize that portion of knowledge.

While trying to achieve this goal, the effort needs to follow the 7 C's of communication –

Clear – There should not any double-meaning aspect in it with only one simple meaning disseminated .

Concise- Not too long or too short, just enough to elicit interest, receive and be inculcated.

Concrete – Only the right point, nothing else.

Correct – Facts and figures must be correct and to the point. Otherwise it would be like misleading the audience.

Coherent – Whatever is being expressed or communicated must be in a proper flow without any gap or jump in the smooth development of the expressions

Complete – All the relevant information, facts and figures must be given effectively without any omission at all. Else, this shall lead to confusion.

Courteous – Messages must be in adequately-refined languages understandable to the people at all levels,

1.8 LET US SUM UP

- While it is difficult to exactly say when the phenomenon of modern science emerged, there are more than one views about it
- One prominent view is that it was initiated in the high middle ages (1277 to be precise) or with 'via moderna' in the 14th century. Another view is that it was the re-birth of science with the Italian Renaissance
- Normally Copernicus is considered as the great science revolutionary
- The scientific revolution is supposed to have taken place in the period of Copernicus to Newton
- Another view is that science revolution took place in the 7th century from Galileo to Newton
- The earliest trace of Science journalism can be traced back to around 120 years to prominent science fiction writer HG Wells
- Carr Von Anda was a prominent and prolific science journalist with The New York Times since 1904 for many productive years
- The National Association of Science Writers (NASW) was formed in 1934 the USA

- George W Gray of Time in 1937 opined that science journalism needed to inculcate awareness about making scientific methods an integral part of popular education
- Digdarshan (1818, Hindi, Bengali and English) was the first ever magazine carrying science news in a prominent way in our country
- The first newspaper in Assamese and the present North-Eastern Region of India – Orunodoi (launched in 1846) carried science news also.
- The Hindu dedicates a full page every week for coverage of some specific aspects of science and technology.

1.9 FURTHER READING

1. The British Journal for the History of Science | Cambridge Core

2. Science journalism: Too close for comfort, retrieved from Science journalism: Too close for comfort | Nature

3. Patairiya, M. Science journalism in India, retrieved from file:///C:/Users/admin/Downloads/2182-Article%20Text-8437-1-10-20160714.pdf

4. What Is Science Journalism? Retrieved from https://www.gcu.edu/blog/engineering-technology/what-science-journalism

5. Science journalism through the thicket of science retrieved from https://www.thehindu.com/opinion/op-ed/science-journalism-through-the-thicket-of-science/article66369346.ece

6. Science Journalism Initiative, retrieved from https://erc.europa.eu/apply-grant/science-journalism-initiative

7. Indian Science Communication Society, www.iscos.org

1.10 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1 : Science needs to be communicated because it is the basis of life. Also a proper usage of its developments and findings determine the level of standard of living of any society across the world. The research findings in the laboratories have to be applied to human conditions so that we can live a better scientific, logical and rational life.

Ans to Q No 2 : Yes, there definitely is a strong connection. If we are knowledgeable about what harm can be afflicted by bacteria and how to prevent it, it shall be helpful to avoid such a situation. Similarly, if we know the proper use of masks we can wear it effectively to prevent diseases which can be spread by air. Thus, science can help us in prevention of many health-related issues and also avoiding superstitious activities.

Ans to Q No 3 : It is not very simple to find out the exact period or time when modern science has emerged. There are several established opinions about it with each having its justification. However, rather than focussing more on this aspect, the right attitude should be to look for every feasible means of communicating

the important findings of Science & Technology to the right target audience for greater cause and benefit. Also, the struggle and great sacrifices of those pioneers in this field made in the early days of emergence of modern science need to be studied properly.

Ans to Q No 4 : Science revolution refers to the age and the happening of coming up of quite a few highly important inventions and discoveries in this field which had revolutionized the world in various fields. For example, Galileo Galilei, Copernicus, Archimedes, Newton and several other scientists who are pioneers in this direction have established many scientific facts and developments which are universally accepted. So, like a revolution, a major body of various scientific developments took place during this period which is termed as a science revolution.

Ans to Q No 5 : Nicolaus Copernicus, a European (Polish) scientist is known as the father of modern astronomy. He had established the fact that the earth and other bodies moved around the sun. Though his theory was not accepted by the society at that point of time, it has changed the way the learned community looked at the solar system later on.

Ans to Q No 6 : Science journalism can be said to have emerged around 120 years ago. That was when the already-established science fiction writer HG Wells felt the need for writing some science and technology developments in popular language for peoples' understanding. So, he can also be called as the pioneer in this field.

In the Indian context, Digdarshan published in 1818 is said to be first ever journal / newspaper which published news of science in its issues. It is interesting to note that this magazine was published in Hindi, English and Bengali. It may be noted that the first ever Assamese newspaper Orunodoi also published some amount of science news in its issues.

Ans to Q No 7 : He was a prominent science communicator of Time in 1937. He famously declared that science journalism needed to inculcate awareness about making scientific methods an integral part of popular education and through it a universal element of civilized thinking". This has gone a long way since then to advance as well as forward the direction of science journalism to new heights at present.

Ans to Q No 8 : Yes. Many newspaper and magazines of the country and the world regularly publish science news in their issues. This is done at two levels. First, many of them like The Hindu and The Frontline have dedicated pages for science and technology-related news items always. The magazine carries in each of its issues while The Hindu have one page in a week for this purpose. Secondly, newspapers and magazines also publish science news on different aspects as and when they emerge depending upon the importance and relevance of the issue.

Ans to Q No 9 : The Indian Science Communication Society (ISCOS) based at Lucknow has been providing training in science journalism to interested people for so many years now. This is in addition to many other science communication activities they undertake from time-to-time. These include publication of a quarterly journal named Indian Journal of Science Communication which is in its second decade of existence.

1.11 POSSIBLE QUESTIONS

A. Short Questions (Answer each question in about 150 words)

Q.1 : Briefly discuss science journalism in India and the world.

Q.2 : What are the aspects which needs to be observed while practicing science journalism ?

Q.3 : Identify a few areas which, according to your opinion needs more focus in the media of the state or the country. How would you write a news/ feature on one or two of such issues ?

B. Long Questions (Answer each question in about 300-500 words)

Q.1 : Discuss the emergence of modern science in this world.

Q.2 : Explain your understanding of the term - Science Revolution.

Q.3 : What is the importance of science communication / journalism in today's era ?