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To Our Readers

Indian Journal of Science Communication invites readers' views and critical comments on any of the aspects of the journal. Suggestions for further improvement in presentation of the journal and its contents are also welcome. Selected letters would be considered for publication under the column 'Letters to the the Editor'.

Energizing Coverage of Energy Issues in Mass Media

The coverage of science and technology in general and energy related issues in particular, does not find adequate space and time in print and broadcast media. Apart from various other reasons, there could be three specific reasons of this situation - i) lack of well researched articles or features, and ii) lack of presentation skills, and iii) lack of appreciation of the subject amongst media management.

Generally, we come across a lot of repetition of data and information with a dry and boring kind of presentations and writings in mass media. This situation needs to be corrected by way of making creative reports, articles, and features, etc., more interesting, lucid and simple, thereby comprehensible to the intended target audiences.

There is also another side of the coin. Generally, various columns on health, science, environment and agriculture are available in newspapers, magazines, but there is hardly any column available on energy issues, while energy is the root cause of any and every human activity, let alone development. Therefore, management of media organizations also needs to be sensitized and motivated by providing them appropriate inputs.

The Indian Renewable Energy Development Agency (IREDA) had started a scheme aimed at enhancing coverage of renewable energy and energy efficiency in mass media by way of making an innovative effort towards addressing the above mentioned specific issues. The scheme offers 4 media fellowships, 2 each in Hindi and English, 1 in senior and 1 in junior categories to attract media persons and science writers to contribute well researched articles and features in national media on these subjects.

The programme covers an assessment of present coverage of energy related subjects and issues by way of scanning national and regional newspapers and magazines and to identify gap areas. One of the strategies of the scheme is to fill these gap areas by enhancing coverage of these identified issues in the media as well as motivating and sensitizing media management.

Some important sites would be identified in the country, where significant work is going on in the area of renewal energy and energy efficiency. The fellows are expected to visit these sites for coverage and take on-the-spot interviews of the experts, workers, and users, etc. On the basis of the research and study of these organizations, and establishments, etc., features and reports would be prepared by the fellows. Such articles would then be published in newspapers and magazines. Even, some of them may appear as radio or TV reports as well.

It is important to understand the effectiveness of media coverage of energy issues with a science perspective or a policy perspective and people's response towards it would be decisive. It is also critical to realize the efficacy of presentation of such issues for public comprehension in print, folk, broadcast or interactive media and find the best medium of communication for a particular locality or community.

It is expected that the media persons can be more pragmatic and strategic to cover energy issues so that they not only educate and motivate the target audiences for sustainable and safe use of energy but also help policy makers to formulate appropriate policies for a balanced approach.

The progress of a country is also measured by the quantum of energy consumed by that country. As a matter of fact, India comes almost at the bottom of the energy consumption graph as compared to various developed and developing countries just above Bangladesh and Sri Lanka, etc. Although, India has all kinds of energy resources, be it fossil, wind, sun, nuclear, or bio-energy, but there is tremendous loss of energy in every sector, due to lack of public awareness and a well structured energy policy.

Therefore, it is a welcome effort to encourage coverage of renewable energy issues in mass media. Such efforts are highly relevant towards making people aware of different aspects of energy consumption and energy saving and thus contributing towards developing an appropriate policy to cater to the energy needs of the people. It would also help draw a realistic picture of energy scene of the country in mass media, leading to enhanced coverage of energy related subjects and issues in mass media and thus educating and motivating people at large with enhanced awareness of energy issues.

- Manoj Patairiya

Science and technology dissemination through Tamil newspapers: A study

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Abstract

A variety of mass media can play an important role in enhancing the knowledge level and quality lives of the common people. Especially the scientific knowledge provided by the mass media can help create a secular, equal and economically prosperous knowledge society, besides eliminating various kinds of social evils and biases. Science and Technology (S&T) information published by mass media could be an agent to social change. In India, both print and electronic media's contribution to the S&T is crucial. A general perception says that regional languages' media give no or minimal space for S&T news. The present study is an attempt to find out the facts and reasons in this regard. Four popular Tamil newspapers for the year 2008 were thoroughly analyzed and surprising facts found. They published only 3.5% of S&T news and they are mostly getting S&T stories from news agencies. They do not have enough dedicated, trained S&T reporters and writers. By and large, researchers and scientists are not media savvy. Absence of a clear policy to monitor S&T journalism also adds to the problem. The study suggests new ways to improve the situation so that S&T news get more importance in mass media.

Keywords: Science journalism, Tamil newspapers, S&T communication

Introduction

What is Science and Technology news? Any news, information, current events, discussions about S&T which is relayed by print, broadcast, Internet to a mass audience is called S&T news. According to Shortland and Gregory (1991) science and technology communication is an important feed for people's daily lives. Public should at least have access to reliable information. Science journalism in other words "what is existent, what is happening and what is important" (Weingart, 2002). At present, India has undertaken a large number of science communication initiatives through mass media. Over 55 thousand print media forms are published in India (including dailies and periodicals), but there is an insignificant constitute of S&T content in terms of number of newspaper and journals and space allotted to them.

Present scenario

Nelkin (1995) says that there is a widespread trend of scientists to condemn the media, with specific emphasis on the lack of quality, inaccurate, sensational and twisted reporting and encourage a negative public perception of science. In opposition, a common complaint is that scientists are so intellectual and immersed in their own field that they can't communicate with media. The tone of science reporting also reflects the scientific development. A study of S&T in the British newspapers in the post-war period provides valuable insight into some of the developments in the field of science communication during the 20th century. During the post-war period an average of 5-6% of editorial space was devoted to S&T. There has been a general increase in the amount of feature articles on science topics in the post-war period

(Bauer et. al., 1995).

In a study, Nelkin (1995) found that readers mostly read stories about natural disasters, followed by energy and conservation. Articles on health, human psychology, nature, space and exploration, in order of preference are next preferred stories. In another survey, environmental and medical news tended to appear throughout newspapers. Erkki Kauhanen and Elina Noppari (2007) said, “continuous research, criticism, discussion will increase the S&T temper and publications in the media. As the amount of S&T material in newspapers is generally considered relatively small in Finland media. Motivation of the S&T and innovation journalism discussions have been to increase the coverage of S&T news. This kind of attempt surprisingly increased the number of S&T stories in the Finland print media”.

In a study Carine van Rooyen (2007) found that the South African press published a small percentage of S&T articles. There is a lack of S&T news coverage. The local press is too dependent on foreign publications and news agencies in the provision of science stories. The positive evaluative tone of coverage and the discourse of benefits point towards a positive relationship between science and the South African press.

The House of Lords of Select Committee on Science and Technology (2000), newspaper coverage of the genetically modified (GM) food issue was of prime importance in shaping a debate in Britain. The committee concluded that one of the main problems was the handling of science aspects of news stories by journalists who are not specialist science correspondents. The committee identified two ways of meeting this challenge. One is, changing the behavior of scientists in dealing with the media, towards open and positive communication. And another is changing the way the media deal with scientists. An Indian study (Arulchelvan 2008) finds, “S&T coverage in the Tamil print media does not get much importance. Lack of trained, educated, dedicated S&T journalist is another issue”. The Indian language print media, especially Tamil media has been regularly accused of giving almost no or minimal space for S&T coverage. However, so far no research study was available to confirm or wipe out these accusations. The present study is an attempt to find the facts of the situation.

Methodology

This research study was a quantitative and qualitative content analysis and an attempt to identify the S&T

news publishing pattern in the Tamil newspapers. Four popular Tamil language newspapers *Dinathanthi*, *Dinamalar*, *Dinakaran*, *Dinamani* were selected for the study. The papers were analyzed from 1st March 2008 to 30th May 2008. These newspapers were analyzed day to day basis; all the S&T contents were analyzed. News articles included were either directly or indirectly from an issue of S&T. Any report, feature, bit which had science as a main theme, focus or subject, was included. The articles were collected according to a well-defined sampling procedure through which a broad spectrum of science subjects was covered. The overall amount of coverage of S&T news was calculated by counting the overall amount of news space in the publications. Average values for S&T news were calculated by using the average number of articles. Various parameters like percentage of S&T news coverage, types, subjects, tone, formats, origin of news, space allotted for news, source and follow-up were analyzed for this study.

Results and analysis

The Tamil newspapers are regularly covering the S&T News. But the S&T news articles are varied from newspaper to newspaper and English and Tamil language in various parameters like percentage of S&T news coverage, types, subjects, tone, formats, origin of news, space allotted for news, source and follow-up, etc. The data obtained analyzes the S&T news coverage.

1. Number of S&T news

Newspapers and S&T news coverage is correlated significantly. Each newspaper differs vastly in their policy and S&T news publication. Availability of reporters, news, space, sources, importance of the news, target audience, interest and need of readers, etc., are different amongst the newspapers. The data shows that (Table 1) Tamil newspapers published 30813 news articles (an average 7703.25 articles/newspaper) during the 3 month research period (April to June 2008). Out of them only 1078 news articles (an average 269.5/newspaper) that is 3.5 percent, deals with S&T area. Remaining 96.5% of news content covers politics, government, crime, legislature, entertainment and education, etc. It was revealed from the Chi-square analysis that *Dinamalar* has published highest number of S&T news followed by *Daily Thanthi*.

2. Types of S&T news

Tamil newspapers publish various categories of S&T news content (Table 2). Amongst them, 32.75% describes technology of products, 36.27% expresses science (scientific facts of different things), 13.64% covers technology (new technology developments) and 18.27% of news is covering research (discussing about research findings on different discipline). Regarding the category of news, each newspaper gives priority to at least one of the categories. For example, the products' technology news is more common in *Dinamalar*. Research based news find more place in *Daily Thanthi*.

3. Subjects of S&T news

The Tamil newspapers published S&T news on different subjects like agriculture, medical, Space, computer, mechanical, geography, nano-technology, chemistry, engineering, physics, and biology. Data from the table 3 shows that, among them medical subject

leads the S&T news items. The medical subjects covered were 31.35%, followed by agriculture 22.26%, and computer related news 21.52%. Other subjects published were very minimal and the range varied from 1.5% to 4%. Tamil newspapers and the subjects of the S&T news are significantly associated. *Daily Thanthi* carried more number of =agriculture news; *Dinamalar* published more number of medical, nano-technology and biology news; and geology, chemistry, engineering news were highest in number in *Dinamani*, while physics and space subjects were published in *Dinamalar* and *Dinamani* in almost equal quantity.

4. Tone of S&T news

The positive tone and approach of S&T news coverage was observed with a positive relationship between science and Tamil newspapers. Most of the news articles are giving positive tone. 60.95% of news is

Table – 1. Number of S&T News and Tamil Newspapers

Newspapers	S&T news	Percentage	Total No. of news	Chi-square value	P value
Dinamani	230	2.83	8137	31.683	0.000**
Dinamalar	334	3.87	8622		
Dailythanthi	317	4.24	7473		
Dinakaran	197	2.99	6581		
Total News	1078	3.50	30813		

Note:

1. ** Denotes significance at 1% level.
2. * Denotes significance at 5% level.

Since P value is less than 0.01 there is association between independent and dependent variables.

treated positively, 31.45% of the news gives neutral and only 7.79% of the news gives negative tone (table 4). Tone is the important parameter for the publication of S&T news. Tamil newspapers published S&T news with more neutrality. Among the Tamil newspapers, *Dinamani* shows more neutrality tone to the S&T news. *Dinamalar* published the S&T news with too positive tone.

5. Format of S&T news

The Tamil newspapers published S&T news content in various formats. Table 5 reveals that a major part of the news content 52.23 % published in news format; 38.22% of news content in short bit format; and 9.74% only in feature format. The newspapers seemingly have a significant presentation of different formats of news.

6. Origin of S&T news

The S&T news is originated from different parts of the

Table – 2. Types of S&T News and Tamil Newspapers

Newspapers	Tec. of product	%	Science	%	Technology	%	Research	%	Total No. of news	Chi-square value	P value
Dinamani	58	25.22	80	34.78	48	20.87	44	19.13	230	53.126	0.000**
Dinamalar	130	38.92	98	29.34	57	17.07	49	14.67	334		
Daily thanthi	97	30.60	119	37.54	37	11.67	64	20.19	317		
Dinakaran	68	34.52	94	47.72	5	2.54	30	15.22	197		
Total S&T in Tamil News	353	32.75	391	36.27	147	13.64	187	17.34	1078		

world. Major part of news (52.13%) is from foreign countries; 33% from Tamil Nadu; and 17.44% comes from rest of India (Table 6). *Daily Thanthi* published more number of S&T news originated from Tamil Nadu, and *Dinamalar* published highest number of news originated from rest of India and foreign countries.

7. Space allocation for S&T news

Giving importance to publish the S&T content is not enough. But the place allotted in a newspaper to particular news is the more important. Tamil newspapers did not offer much importance with regard to space for the news. About one third of content (33.86%) placed in the newspaper supplements. Rarely (3.62%) they give main or first page for the S&T news. Some 24.30% S&T contents were placed on district pages; 22.63% place on the world pages; and 15.77% of S&T news was placed in the state capital Chennai pages (Table 7). There is a significant association between Tamil newspapers and space allotted for S&T news. *Dinamalar* allotted more space in the main,

district and Chennai pages. *Daily Thanthi* provided more space for S&T news on the supplementary and world pages.

8. Source of S&T news

The major news source for the Tamil newspapers is various news agencies. About 70% of the S&T news was supplied by news agencies. Only 30% of S&T news is provided by their reporters and correspondents (Table 8). Regarding follow up of the S&T news, Tamil newspapers are also very poor. About 3% of S&T news only published with a follow up. *Dinamalar* has its own reporter for S&T news. At the same time it is also more dependent on the agency sources. In terms of follow-up, *Dinamalar* is the only newspaper that gives importance to follow-up as compared to other Tamil newspapers.

Findings and conclusions

This study pointed out that Tamil print media is very poor in S&T coverage (3.5%). They mainly publish

Table – 3. Subjects of S&T News and Tamil Newspapers

Newspapers	Agr	Med	Spa	Com	Mec	Geo	Nan	Che	Eng	Phy	Bio	Total No. of news	Chi-square value	P Value
Dinamani	47	51	19	31	14	8	5	13	15	12	15	230	81.270	0.000**
Dinamalar	60	113	19	68	12	5	6	12	10	12	17	334		
Dailythanthi	95	93	14	78	2	6	1	8	6	8	6	317		
Dinakaran	38	81	8	41	2	3	3	5	7	4	5	197		
Total S&T in Tamil News	240	338	60	218	30	22	15	38	38	36	43	1078		

Table – 4. Tone of S&T News and Tamil Newspapers

Newspapers	Neutral	%	Positive	%	Negative	%	Total No. of news	Chi-square value	P value
Dinamani	165	71.74	18	7.83	47	20.43	230	366.04	0.000**
Dinamalar	52	15.57	264	79.04	18	5.39	334		
Dailythanthi	88	27.76	219	69.09	10	3.15	317		
Dinakaran	34	17.26	156	79.19	7	3.55	197		
Total S&T in Tamil News	339	31.45	657	60.95	82	7.60	1078		

S&T articles related to technology of new products; science and research find low attention. As compared to other subjects, Tamil newspapers publish more agriculture news. The study shows that Tamil newspapers are very positive in tone in publishing of S&T news irrespective of the language. They mostly utilize the news format (52.23%) to publish the S&T contents, followed by bits and feature formats. Each Tamil newspaper is different in the format of presentation of S&T content.

Tamil newspapers have published more S&T news which were originated from Tamil Nadu. It reflects that, regional media gives more importance to the local S&T subjects closer to the society. Each Tamil newspaper differs on the place of origin of S&T news. As far as the space allotted for the S&T content is concerned, they tend not to give more space in the front page. Tamil newspapers mostly depend on news agencies (70%) for S&T stories. Very minimum numbers of stories are

provided by their own correspondents.

As obvious, most researchers, academicians, and scientists are not newspaper friendly. Sometime even they do not speak out to the press. It adversely affects coverage of scientific news, innovation, discoveries, etc. It is also suggested that there is a need for dedicated and trained science reporters and writers for more science coverage in Tamil newspapers.

The present scenario can be changed by application of new ideas, methodologies and strategies to coverage of S&T news in Tamil newspapers. Recruiting trained S&T journalist, using modern communication technologies and effective networking are some of the possible solutions. Providing training, conducting short term and refresher courses to the existing journalists is also important. Academic exchange programme could be an effective alternative. Developing a clear policy by newspaper groups for coverage of S&T news would be an advantage.

Table – 5. Format of S&T News and Tamil Newspapers

Newspapers	News	%	Feature	%	Bits	%	Total No. of News	Chi-square value	P value
Dinamani	159	69.13	22	9.57	49	21.30	230	39.124	0.000**
Dinamalar	167	50.00	37	11.08	130	38.92	334		
Dailythanthi	144	45.43	29	9.15	144	45.43	317		
Dinakaran	93	47.21	17	8.63	87	44.16	197		
Total S&T in Tamil News	563	52.23	105	9.74	410	38.03	1078		

Table – 6. Origin Place of S&T News and Tamil Newspapers

Newspapers	TN	%	India	%	Foreign	%	Total No. of news	Chi-square value	P value
Dinamani	66	28.70	38	16.52	126	54.78	230	19.016	0.004**
Dinamalar	85	25.45	65	19.46	184	55.09	334		
Dailythanthi	116	36.59	52	16.40	149	47.01	317		
Dinakaran	89	45.18	33	16.75	75	38.07	197		
Total S&T in Tamil News	356	33.02	188	17.44	534	49.54	1078		

Table – 7. Space allocation for S&T News and Tamil Newspapers

Newspapers	Main	%	District	%	Chennai	%	Supplementary	%	World	%	Total No. of news	Chi-square value	P value
Dinamani	6	2.61	54	23.48	28	12.17	78	33.91	64	27.83	230	24.505	.01735**
Dinamalar	19	5.69	87	26.05	61	18.26	98	29.34	69	20.66	334		
Dailythanthi	6	1.89	82	25.87	49	15.46	107	33.75	73	23.03	317		
Dinakaran	8	4.06	39	19.80	32	16.24	82	41.62	36	18.27	197		
Total S&T in Tamil News	39	3.62	262	24.30	170	15.77	365	33.86	242	22.45	1078		

Table – 8. Sources of S&T News and Tamil Newspapers

Newspapers/ Source	Reporter	%	Agency	%	Follow-up	%	Total No. of news	Chi-square value	P value
Dinamani	65	28.26	157	68.26	8	3.48	230	28.790	0.000**
Dinamalar	111	33.23	204	61.08	19	5.69	334		
Dailythanthi	107	33.75	209	65.93	1	0.32	317		
Dinakaran	42	21.32	152	77.16	3	1.52	197		
Total S&T in Tamil News	325	30.15	722	66.97	31	2.88	1078		

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Role of scientists in science communication

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Abstract

The paper reviews the science coverage in the Indian media. Scientists and non-scientists are compared in role of communicators. It also reports the analysis of a survey of 72 persons, with and without science background, on whether scientists communicate for the public and whether they should. The 16 questions explored several other aspects of science coverage in the media and opinion emerged that the coverage is inadequate. A good fraction of the surveyed scientists have involved in science communication at some stage or the other. The near total consensus cutting across backgrounds sees an important role for scientists in science communication. It is suggested that apart from communicating themselves, scientists can assume several other roles, such as of knowledge bank, for promoting science coverage. More people with science background in the media may also help in enhancing authentic science coverage.

Keywords: Science communicator, Indian media, non-scientist, Scientists' perception

Introduction

The ever increasing role of science and technology in myriad aspects of common life has given birth to a wholly new field of 'Science Communication'. Science communication is a specialized communication and is understood to be the act of communicating science to a non-expert through any medium. Teaching science, i.e. classroom lectures, and research communication for research journals/ researchers of the field are excluded from this exercise.

DH Lawrence's grumble of knowledge having "killed the Sun, making it a ball of gas with spots..." is by no means a lone cry. Many share this view. However, a befitting rebuttal came from Richard Feynman, who said, "poets say science takes away from the beauty of the stars—mere blobs of gas atoms. Nothing is 'mere' . . . It doesn't do harm to the mystery to know a little about it. Far more marvelous is the truth than any artists of the past imagined! Why do the poets of the present not speak of it?"

However, what Lawrence wrote is not completely

isolated from the reality, as, for many, there is a basic difference between the perception of a common man and that of a scientist about science. Mathematician Poincare said, "The scientist doesn't study nature because it's useful; he studies it because he delights in it and because it is beautiful". Poincare meant 'profound beauty which comes from the harmonious order of the parts and which a pure intelligence can grasp'.

Role of a science communicator

A science communicator has to convey the complex concepts of scientific and technological world to those whose knowledge of science may be abysmal. There is no shying away from this as science and technology have become an integral part of the lifestyle today. The developments in science and technology also mean that the task of a communicator has become more difficult as the information to be communicated is more complex. A common man, who has no formal education in science, is inundated with umpteen number of jargon

from radio, TV and print media, day in and day out. To be with the contemporary, to be in tune with the changing environment, one has to keep updating one's information base. This is one aspect of the evolution of the society.

An average reader expects an interesting, informative/ useful and easy-to-understand material. The material may be attractive to him for different reasons. Sometimes, it may be because it helps him save money such as by using energy-efficient methods, or because it helps him take care of health and thus prevent diseases and so on. At some other time, it may be because it helps satisfy the curiosity. For instance, it may help him understand the night-glow he noticed last night or understand the reason for the recurrent landslides! But explanation for the common man has to be simple and in a terminology that he understands. This means drawing out similes or metaphors from the daily life. This also means leaving out intricate details. Here comes the crucial point. How much dilution of scientific information is allowed?

Dilution is allowed only as long as it doesn't introduce distortion. It is not uncommon to come across articles or talks where the reader or listener is put off right at the outset by the heavy and jargon-filled content, which fail to convey anything at all at the end. On the contrary, there are cases where one gets no substantial scientific information from the write-up or the programme because the author, in an effort to make it interesting, left out even salient features! A successful communicator is one who can strike a right balance. There cannot be any set rules for this. The variation is naturally depending upon the subject and the target group. A popular science article for scientific community, even with a wide range of specialties, will be written very differently from that in students' column in a newspaper or in a children's magazine.

Communicating science is an art because with so many people with background in science, only a few excel in communicating. It may be debated whether communicators can be made with training but their skill can definitely be improved with proper guidance and training.

Scientist vis-a-vis non-scientist as a communicator

So the question is: who is to take up science communication? There is no doubt that science (especially news-) journalism will be done by the journalists; it's their job. Research in science will be done by the scientists; it's their job! But apart from the newspaper journalism, there is a whole range of science

communication activities where there is an overlap. Many of the renowned scientists are known to have enjoyed talking science to common people or writing for them. Prof. Ruchi Ram Sahni, father of Prof. Birbal Sahni, was known for giving public lectures on science even in those days. He was a chemist and had worked in Prof. Rutherford's laboratory (1).

Prof. C V Raman is known to have been an inspiring speaker whose energy showed. The 'Science for School Children' sessions during the Science Congress and lecture-cum-interactions of leading scientists during programmes like National Children's Science Congress have been quite popular. Direct interactive sessions by Prof. Yash Pal with children have been tremendous hits as were his programmes on TV channel. His column on science in print enthralled many and the selected material with additions and modifications later came out as a book too (2).

Prof. Narlikar's science fiction also became popular. Dr. D Balasubramanian and several others regularly write for newspapers and magazines in easily understandable language. The documentation of lectures given by Prof. C N R Rao, Dr. R A Mashelkar and Prof. M Vijayan at University of Lucknow also became quite popular (3).

The lectures may have different purposes: to educate, to inform, to inspire or simply to bring science in lime light to ensure inrush of funds. While some senior scientists lecture on the matters related to science policies and like, there is need for more scientists to come forward and bring to common man the charm, joy and ecstasy of science and discovering. The value of such lectures should not be undervalued. The Friday lectures at Royal Institution in London can certainly take some credit for discovering Faraday through Davy's lecture (4).

These lectures were always well attended and seemingly popular though it is difficult to say how many attended for interest in science alone. The drawing power ('star-value') is not in just content or style, also the aura associated with a scientist that draws people to their lecture. The rush to the lecture of Stephen Hawking is an example. Nobel Laureates always have it, even when they are not outstanding as speakers.

An ideal situation for science communication would be a good scientist with good communication skill talking about it. This would ensure that distortion is avoided as he knows the subject best. His statement carries authority also. The added advantage is that the young ones see a role model. It cannot be sheer chance that the last four Indian Kalinga award winner Indians

had had a long training in scientific research. Besides, every scientist brings in his own tinge to the subject while speaking or writing on it. Peter Medawar termed scientists as ‘people of very dissimilar temperaments doing different things in very different ways.’ He said, ‘Among scientists are collectors, classifiers, and compulsive tidiers-up; many are detectives by temperament and many are explorers; some are artists and others artisans. There are poet-scientists and philosopher-scientists and even a few mystics’ (5).

The variation in different scientists’ approaches and presentations is natural. Paul Davies put it succinctly when he wrote, ‘There is a popular misconception that science is an impersonal, dispassionate, and thoroughly objective enterprise. Whereas most other human activities are dominated by fashions, fads, and personalities, science is supposed to be constrained by agreed rules of procedure and rigorous tests. It is the results that count, not the people who produce them. This is of course manifest nonsense. Science is a people-driven activity like all human-driven endeavour, and just as subject to fashion and whim. In this case fashion is set not so much by the choice of subject matter, but by the way scientists think about the world’ (6). So, the scientists communicating science will not necessarily be a colourless, drab affair; instead each will have its unique flavour.

However, the fact remains that scientist as science communicator is not common place. The reason why that does not happen is understandable. While scientists may be good at developing concepts which may also prove to be extremely useful to the society, they are usually not good at communicating them and their significance to the common man. There is a genuine reason for this: Scientists are evaluated based on their research publications and not communications targeted at public.

Besides, they are used to writing in research journals for the peers, for the experts, who understand the symbols and the jargon, and also appreciate a scientist’s concise and precise ways. A scientist would prefer to use one word while a common man may require a long explanation to get the meaning. A common man can neither afford those expensive journals nor can comprehend the technical language used therein. Also, the scientists work to solve the riddles of nature using rigorous methods and techniques and deal in abstract concepts which demand considerable energy, time and perception. As a result, to a scientist, the methods and techniques are as dear as the results while a common person has little interest in the process. Scientist’s bias for the methods also shows up in the communication

proportionally.

Now as for the common man, he is usually not interested in the intricacy of the approach. His interest is usually limited to the result, to the product and, more importantly, to how it affects his life or how it can be useful to him. But, at the same time, scientist is the person who understands the full implication of the work. This is where role of a communicator comes in picture. He acts as link between the scientist and the layman. Besides, very often, the scientists may take too much for granted for the reader while the reader is probably un-initiated in the field.

Scientists as communicator

Scientists talking for common man is not a new thing. It may surprise many that first street to be made one way in London was Albemarle and the reason was the observed rush on the Friday Lecture evenings at Royal Institution! Those who lectured there included likes of Humphrey Davy, Dalton, Lawrence Bragg and Michel Faraday. In fact, Faraday gave 126 lectures in 37 years. The Christmas lectures were a rage with children. Later, these lectures were televised beginning 1966. Faraday also wrote up one of his lectures (Chemical History of a Candle), also reprinted by Vigyan Prasar. Robert Feynman and Peter Medawar also had exceptional ability to write and also speak impressively but not all great scientists are great speakers.

However, those who write well can also be effective in speaking for the sheer beauty of the style and material even if they are not gifted speakers. In his article ‘The Art of Talking about Science’, Bragg stated, ‘I feel so strongly about the wrongness of reading a lecture that my language may seem immoderate.... (But) There are people who so refine and weigh every word and sentence that their beautiful prose becomes almost poetry’.

Being usually in government- or industry-supported jobs, scientists are also constrained by service rules, have to toe the official line, or worry about guarding commercial information. In James Lovelock’s words, they have exchanged their freedom for regular salary, post retirement benefits etc. In general, scientists are hesitant of talking to press; possible distortion being the greatest deterrent. In addition, the incremental nature of advancement means that a scientist is careful that he talks about his contribution alone, but unless put in the broad picture, it seems meaningless or unimpressive. The scientist’s effort to focus on the narrow part of the spectrum, rather than giving the whole picture, often makes it look too abstract or even

esoteric and also incomprehensible for the layman. They also give too many details for which only the specialists care. This is what Nobel Laureate Lawrence Bragg meant when he said, 'As in a picture, so in a lecture, the force of impression depends upon the ruthless sacrifice of unnecessary details' (7).

Non-scientist as a communicator

The other alternative of a non-scientist communicating science is also not a completely safe choice and is fraught with problems. If the writer is not clear about the details, it is not possible for him to convey a simplified and clear picture; he would not know which details to mention and which ones to ignore. There is nothing like a clear picture of a hazy object. One quite often comes across articles where there is little science or there is distortion. Exemplifying done by 'popular' science writers has its own risk because, at times, the reader is not clear as to in which respect similarity is suggested. For instance, comparing some object to 'doughnut' may allude to similarity in one or more respects out of the shape, taste and colour. Very often the similes from foreign context are not intelligible to Indian audience/ readership. Using a simile from local context requires a clear understanding of the concept by the author.

An often-asked question is if science education is essential for a journalist. For a specialist writer, it is essential. But a journalist writes on varied topics. He cannot master many subjects. But a science journalist does not cover one field alone. In my opinion, background in science certainly helps but given the diversity of fields, it is the curiosity, interest, intelligence, persistence, logical approach and ability to pose the right question that are at least as great assets as knowledge of that science. For newspaper-journalism, especially, nose for news can also be termed an important asset. At the same time, training in science, especially in scientific research, is also a definite asset though not sufficient. Apart from the information part, this means an advantage because of his developed capability to comprehend abstract concepts of science, choosing a right question, and working in an organized manner, having an understanding of the method of science and an already built-up network.

The biggest problem with a non-scientist communicating science is sometimes ending up trivializing the arduous process in an effort to glamourize it, to make it interesting or, at times, simply due to unawareness. Even a simple looking solution may be the end product of a long process of trials

carried out intelligently. To make it look sheer chance can do more harm than good. It does not auger well for an aspirant in research who may imbibe a completely wrong, simplistic and fantasy view of research.

A traditional medicine may be known to everyone, but to establish it as a drug needs a very long process of analyses and trials. Even serendipity is not sheer 'luck' as some would have us believe. It requires a tremendous mental flexibility and caliber to comprehend and interpret an unexpected scenario. Chance does play a role, but 'discovery meets a prepared mind', would be a better way to project it. Making a good observation has an element of chance too, but interpretation requires a clear, logical and knowledgeable mind. One comes across instances where the writer or presenter makes some discovery look very simple, almost conveying that it was silly of others to have missed it.

The press-coverage of science programmes is usually event-based, focusing more on the perfunctory affairs. A look at most of the other news items related to science events shows that very often they are either too general or too technical. At times the news item reads like 'Dr. X gave an interesting and illuminating lecture on (a very broad subject such as Space Science, Earth, Astronomy, Climatology or Plant Life), which was very much appreciated by the audience. He explained in depth many new discoveries in (space science or...) and the advancement India is making'.

In other words, little is conveyed except association of a few names. On the other extreme would be a release-based coverage where, after the opening line, the technical jargon-filled passage is lifted verbatim from the text of the speech which is understandable to no one except the speaker and probably a few of the organizers. The reports on interactive sessions are not generally accurate, usually suffering from factual and other errors evincing lack of understanding. They most often confuse the reader and embarrass the speaker.

Scientists' perception of scientists in communicator's role: The survey and the respondents

A limited survey through e-mail and circulation of questionnaires was conducted to gauge how the scientists, the communicators and the others feel about scientists' role in science communication. Here opinion of scientists is discussed.

Methodology

The methodology followed for the survey, in brief, was as follows. About 100 persons were e-mailed the questionnaire that included scientists, science administrators, science communicators/ journalists and others. There is a definite possibility that those not mailed individually had the e-mails landing in bulk/spam folders and hence ignored it. Fifty-two persons responded. Twenty-three persons were given the printed forms, 20 of whom returned. Some were not very comfortable with the language so were explained in Hindi. Some people responded in more than one capacity. The incomplete forms were ignored.

Questionnaire

In all there were 16 questions for each category of people viz. scientists, science communicators/ journalists and general public. In addition to four questions related to age, domicile/ language, education., there were also another four questions regarding some individual background and habits (question numbers 5, 6, 7 and 9), aimed at helping in analyzing habits across different backgrounds with respect to subject studied and professions. The question number 5 was not directly relevant but shows variation of faiths in the sample. The question numbers 8 and 10 were also posed to all to know their opinion about scientist's role in science communication and science coverage in media.

The last six questions (11-16) were presented as three sets: A for scientists, B for journalists/ communicators and C for the general people (no direct connection with science or science communication) though two questions (15 and 16) were common to all three sets. The respondents were allowed to fill up more than one set depending upon their judgment regarding their role.

However, here, responses of scientists to those questions are discussed that are closely linked to scientists' role in science communication. The results for other questions and detailed discussion on them will be presented in a more detailed paper elsewhere.

In addition, the four questions in the set for scientists were aimed at learning about scientists' interaction with the media and the media men and, also, how they felt about their own communication abilities, i.e. if they required any training.

Response

This survey response has a limited base—only 80 responses (from 72 persons, 7 of whom responded in 2

or more capacities). Only one opinion was counted from one person. Of these 52% respondents had doctoral degrees in science. Hard copy responses were distributed only locally in Lucknow and Malihabad. The responses are dominated by those from nine Indian states and Union Territories though single responses came from Iran, Israel, Russia, Singapore and USA also. Responses came from various language groups and were from people with 12 different languages being spoken at home though majority of the respondents spoke Hindi at home. The other languages spoken at homes of the respondents were Bangla, English, Gujarati, Malayalam, Marathi, Panjabi, Persian, Russian, Tamil, Telugu and Urdu.

Numerically, the response from scientists was highest (72%). Of these 62% engage in communicating science to public. This category includes people who are using their knowledge of science in their profession, whether in research or otherwise. Interestingly, very few of the full time science communicators responded, including those whose fulltime job is based on science communication/ science journalism. A good fraction of the scientists who responded are those who engage in communicating science to public in different degrees; 21 doing it five times or more in a year.

It is clear that the respondents cannot be termed representative sample of the society. They represent the opinion of the scientists, with 75% of the respondents having science education at masters or doctoral level. However, we have considered only scientists' opinion in this paper. Most of them are net users (survey was through net and printed questionnaire). Almost all of those surveyed understood English language. A few were, however, explained in Hindi too. Of the 52 respondents from sciences, 33% were in the age bracket above 50 years. Majority of the respondents was not particular about keeping the identity undisclosed.

Result and discussion

In this paper, not all of the questions answered by 52 scientists are being taken up. The discussion is limited to those related to the theme of the paper, viz. role of scientists in science communication. Opinion on some issues was near unanimous. There were two questions that were expected to elicit only one answer (question numbers 8 and 15) but it still sprung up some surprise! Almost all respondents (70 out of 72, 97%) believe that scientists should involve themselves in science communication. Interestingly, for non-scientists, the percentage is 100% who believe that scientists should

engage in science communication. Forty-six out of 52 scientists (88%) feel that everyone in society needs a minimum level of knowledge in science.

But half (10) out of 20 non-scientists, feel that a minimum level of science is not required for all. Less than 20% scientists opined that science coverage in media is adequate. When asked, as a follow up, a science graduate (who believed, it was adequate) said that considering Discovery, National Geographic and Animal Planet TV channels, the sum of print and audio-visual coverage can be termed adequate. Among others, a higher percentage (20%) found it adequate among those who responded. In the planned follow-up study, these people with uncommon opinions will be contacted for elaborating on their views.

Twenty of the scientists (38%) said that they seldom involved themselves in science communication for public while 32 (62%) said they did it occasionally/often or frequently. Of the 52 scientist respondents, 11 (21%) had experience of having been misrepresented. However, it is not clear whether this was because of problem with their expression or understanding of the reporter. Interestingly, 38 (73%) scientists feel that training in science communication would help them.

This finding should be of interest to agencies involved in science communication training. It may also be mentioned that some of those who answered in affirmative to undergo training, are very well established even in communicating science. Some of them politely added that learning is always welcome. All the scientists read science news beyond their field. While 10 respondents (19%) said they did it occasionally, 17 (33%) said they did it often and 25 (48%) said they did it very regularly. An overwhelming majority of 88% (46 out of 52) feels that it matters whether the editor of the publication has a background in science, meaning that the editor with science background would mean higher coverage for science. This should also be useful to those involved in planning the science journalism courses. Among the non-scientists, the opinion was equally divided with half saying 'yes', and half 'no'.

The scientists can play a great role in science communication even without getting directly involved in communicating themselves. Some journalists might drop a story if they are unable to fully understand it. A scientist can help them read the fine print, explain the difficult concepts and help them put a report in perspective. There are scientists who e-mail or post popular level articles appearing in their known magazines or journals to journalists providing an information-bank, or are regularly contacted by media

people not just for opinion but also to clarify concepts or elicit information. So there are several roles open to the scientists such as:

- A knowledge bank/ resource person for media
- A communicator to public as well as media personnel
- A mentor to students of science communication as well as to media people in matters related to S&T.

Conclusions

Given this situation, the scientist must involve themselves with science communication in one or more of the many possible roles. It is their duty to society and it should be encouraged by the authorities by modifying rules if they stipulate otherwise. Despite the progress in science and technology, attitudes are not progressing at the same rate in being scientific. The decline in good students' inclination for research and science has been noticed and demands a better exposure of students to good science lectures as has been tried by several departments like Department of Science and Technology (DST) and Council of Scientific and Industrial Research (CSIR) of late. Enhancement in science communication will not only promote dissemination of scientific knowledge, but also promote a scientific temperament. Equally importantly, it will help to sustain curiosity in the society.

Given the limited statistics of the survey, it would be difficult to attach too much significance to the results if opinion were evenly divided, but on most issues near unanimous opinion is revealed and perception emerges that science coverage is inadequate in media and it will help to improve science coverage if editorial groups have people with science background. Scientists should engage in science communication and training for scientists in communication would be of help and is desired by scientists themselves.

The thinning of wall between the scientist and journalist is also a must. More frequent dialogue, development of faith and overcoming the hesitation in approaching a scientist are essential.

Annexure-1

The results will be put in a general way but still please indicate in case you would like your identity not to be disclosed. Add any other info/ comments that you would like to add.

Questionnaire

1. Name	
2. Country of birth/ language at home:	
3. Country of present residence:	
4. Age (a). upto 25 (b). 25+ to 35 (c). 35+ to 50 (d). 50+ to 60 (e). 60+	
5. Do you follow religious rituals (a). Sincerely (b). For social/ sentimental reasons (c). Never	
6 Years of education in science? (a). Class I to X (b). Up to XII (c). Ist degree (d). Masters (e). Doctorate	
7. Nature of work: (a). Scientific research (b). Science- journalist/ Science Communicator (please mention medium) (c). Both (d). Science-teaching (e). Any other (please specify) Please mention work experience in research/ science journalism/ otherwise. Please mention in which of the 3 catagories.	
8. Do you think scientists should involve themselves in science communication for public? (a). Yes (b). No	
9. Do you like (a). Reading science fiction (b). Watching science fiction movies?	
10. Do you think Sci and Tech coverage in media is adequate? (a). Yes (b). No	
A. If a scientist:	
11. Do you communicate science to public through any medium? (a). Seldom (b). Occasionally (twice a year) (c). Often (5 times a year) (d). Frequently (once every month or more)	
12. While talking to press, have you ever been mis-reported? (a). No (b). Yes (how many times so far?)	
13. Do you think some training in communication would be helpful to you? (a). Yes (b). No	
14. Do you read science news, which is outside your field, in papers? (a). Seldom (b). Occasionally (c). Often (d). Almost always	
15. Do you think everyone must know some science? (a). Yes (b). No.	
16. Do you think editor's background being science influences science content of the publication positively? (a). Yes (b). No	
B. If a science journalist/ science communicator:	
11. Based on the scientists you may have come across, how would you rate the scientists as science communicator, on average, on a scale of 1 to 10?	
12. If you talked to scientists and reported, how many, if at all, complained of having been mis-reported by you ? (exclude printer's devil)	
13. Do you think more exposure in science would have helped you in science journalism more? (a). Yes (b). No (c). Not sure (d). My exposure is adequate	
14. Do you like to read science articles or listen to/ watch/ attend science programmes/ lectures? Can you remember any particular article or lecture you liked?	
15. Do you think everyone must know some minimum science? (a). No (b). Yes	
16. Do you think editor's background being science influences science content of the publication positively? (a). Yes (b). No	
C. If other than scientist (A) or scientist journalist (B)	
11. From your experience, do you believe that scientists are more organized/ systematic in approach? (a). No (b). Yes	
12. In your experience, how are scientists as communicators? (a). Like others (b). Better (c). Worse? Can you recall any exceptional communicator(s)?	
13. As a student, did you like science? (a). Yes (b). No (c). Liked but found difficult	
14. Do you read or skip science items in news papers/ magazines? (a). Seldom (b). Occasionally (c). Often (d). Almost always	
15. Do you believe every one must know some science? (a). Yes (b). No	
16. Do you think editor's background being science influences science content of the publication positively? (a). Yes (b). No	

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Seri - Information Kiosks: Science communication and beyond

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In this information technology age, most of the people in the developed countries and a substantial section of the population in the developing countries like India, access the internet to seek information on various subjects, thanks to information communication technologies (ICT). But, in many developing and under developed countries, there are still a substantial number of people who have no access to such technologies as a result of which they are disadvantaged in their access to information. This is specifically true in case of farming community; and sericulture and silk industry are no exception to it!

The phenomenal growth in silk production of the country during last two decades was largely due to the series of research breakthroughs made by various research organizations of the Central Silk Board like, evolution of productive bivoltine silkworm breeds/ mulberry varieties, appropriate rearing technologies for bivoltine and cross-breeds, package of practices, etc.

Though, Central Silk Board and state Departments of Sericulture of different states are actively involved in taking such technologies and recent findings to the stakeholders through their extension networks effectively, yet in order to strengthen the extension network through IT initiatives Central Silk Board developed Seri- information Kiosks in English and regional languages. These touch screen kiosks have helped sericulturists to access sericulture and silk related technologies and information actually on finger tips! It is in this backdrop, an effort was made by CSB to address the needs of the stakeholders through IT initiatives. And one of such effort was introduction of Sericulture Information Kiosks.

They mainly provide information on new mulberry varieties; silkworm races; packages of practices; diseases/ pests and their control measures; seasonal forewarning; reeling; wet processing; weaving; training programmes; projects/ schemes; market information; details of manufacturers/ dealers of sericulture appliances/ chemicals, etc. The market information on

cocoon and silk at designated markets is updated on day to day basis. These Kiosks have been already working in few selected sericultural states successfully.

The farmers have been utilizing these touch screen kiosks for their requirement. Still efforts are on by the CSB to bring in these units under on-line connectivity for updating the market rates of cocoons and silk on hourly basis. Now, efforts are being made to put these kiosks on interactive mode, connecting the stakeholders with the research institutes of the CSB and Departments of Sericulture.

Sericulture is an important economic activity becoming increasingly popular in several parts of the country. It suits not only for marginal and small farmers but also large scale farmers as it offers assured periodical income with little investment and creates family employment round the year besides being a foreign exchange earner. The development of latest sericulture technologies has not only reduced the production risks but also increased considerably the productivity and quality of cocoon- the raw material for silk industry.

The phenomenal growth in silk production the country could achieve during last two decades was largely due to the series of the research breakthroughs made by various research organizations of the Central Silk Board in general and the Central Sericultural Research and Training Institute (CSRTI), Mysore in particular, through popularization of agronomical practices for mulberry cultivation, evolution of productive mulberry varieties/ bivoltine silkworm breed, appropriate rearing technologies for bivoltine and cross-breeds, etc. In totality the tropical bivoltine technology package developed by the CSRTI, in fact has revolutionized the Indian sericulture industry.

Sericulture information: Touch Screen Kiosks

These Kiosks are interactive touch screen driven with icons displaying focused information/ data supported

by photographs, videos, graphics, etc. They have simple and clear navigational paths. The hardware is insulated from the users. It is compatible with other applications - stores the entire information, and displays with voice over in English and regional languages like Hindi, Kannada, Telugu, Tamil, Malayalam, Kashmiri, Marathi and Bengali, etc. There is a facility for taking out print outs also.

Working successfully across eight states for easy facilitation of sericulture information and online rates of silk, these Kiosks have been installed in various cocoon markets and silk exchanges where farmers gather *en mass* for transactions.

These kiosks play voice with background music. IT tools including computerized database and communication tools have been integrated herewith photographs, videos, etc., to realize the concept of Information Kiosk. It is a best example where IT provides an opportunity to the rural communities to use tools that support them in decision making related to sericulture by providing required information.

The farmers are already utilizing these touch screen kiosks for their requirement. Still efforts are on by the CSB to bring in these units under on-line connectivity for updating the market rates on hourly basis. The model, for the first time in sericulture, builds a strong communication bridge between sericulturists and researchers. Different queries are answered in FAQ section.

A serious thought is being given to put these kiosks on interactive mode, connecting the stakeholders with the Research Institutes of the CSB and state Departments of Sericulture.

The increasing popularity of these kiosks has made CSB to deploy these machines in different states *i.e.* Karnataka, Tamil Nadu, Kerala, Andhra Pradesh, Maharashtra, Jammu & Kashmir and West Bengal.

Need for Seri-information Kiosk.

The Central Silk Board has developed these Information Kiosks mainly to propagate sericulture in different parts of the country which will ease the work of extension workers.

Seri-information Kiosks also provide:

- Easy & Effective information
- Latest R&D information
- Forewarning about Diseases
- Latest Market Trends from across the country

- One touch access for farmers contacting sericulture experts
- Connection to R & D units to actual field for effective research compilations and outputs
- Systemic outlays of projected plans and also
- Collect data on day-to-day activity for effective compilation and implementation of needful steps
- For mulberry, silkworm & Silk production

To propagate sericulture in masses

Silk being a *niche* commodity, its production also involves numerous steps/ stages. A common man or a silk enthusiast actually understands a basic terminology that cocoons give out silk fibre. But, in reality, the complex technology involved in producing a single strand of silk needs to be emphasized in a simple and effective way. Seri-information Kiosk is one of the most effective medium to achieve such objective. It not only provides seri- information to farmers but also other sericulture enthusiasts like students of sericulture, entrepreneurs, and the like.

Easy and effective information hub

Complex data need complex system to explain, but sericulture being a traditional activity involving rural families in production of silk, an easy and yet effective medium is needed to explain the right relation between latest technology and sericultural activity in their mother tongue!

Educating Seri-culturists

Exploring the new heights of IT, Kiosks provide latest sericultural technologies to farmers. By doing so, a virtual training room is created to exchange ideas and share the latest techniques to embed a real depth into traditional practice of sericulture. Using the same media, various activities of promotion and propagation of sericulture are achieved.

Provide latest R&D information

A numerous technological advancements happening at the research institutes need to be passed on to the actual field where the core activity of sericulture happens. Using the Kiosk media latest advancements in moriculture, silkworm races, post cocoon technology, etc., can be passed on to the end users *i.e.*, farmers, reelers, weavers, etc. The results of such activities with their

complex data can be analyzed to further improve the technologies.

Forewarn Seri-culturists about diseases

Traditionally any forewarning system works on basis of information exchanged between the end user and experts. But the lacuna of such system is that, it will not suffice to any individual in need or cannot be customized to forewarn a particular sect or any individual spread across the Seri-zone. With the advancements in IT in tandem with remote deployed Kiosk, customized forewarning systems can be made to warn Seri-culturists in advance about any natural calamity, pest/ disease attack to either mulberry. At the moment, seasonal forewarning is being given based on the data base and up to date field reports.

Provide latest market trends from across the country

At present market prices of cocoon and silk are given day to day basis. However, with *VSAT* connectivity, cocoon/ silk prices across the country can be accessed and even sericulture commodities can be traded online

from remote locations using Seri-information Kiosks. A serious thinking is being given by CSB on these lines.

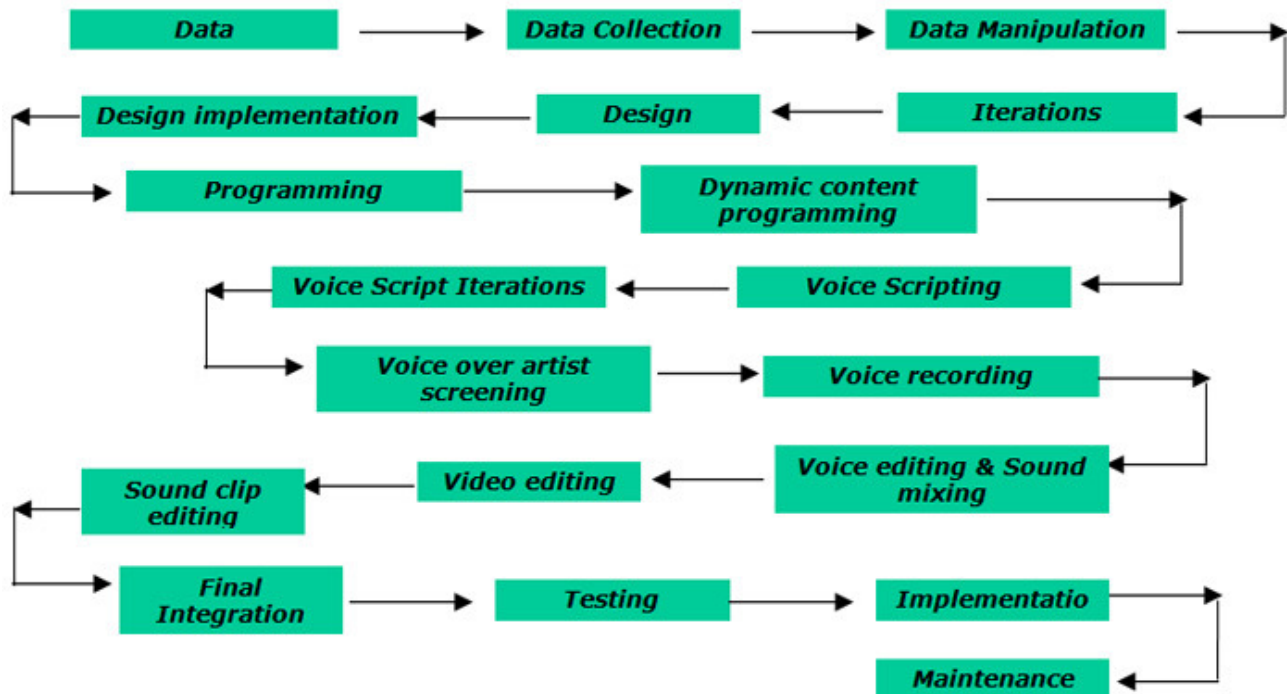
One touch access for farmers contacting sericulture experts

Hurdle with any advanced system is the co-ordination or interaction between experts and the users, once this barrier is over come, 90% of field problems are solved. Kiosk being a viable medium, its vast utilities can be used as an interactive media to connect field personals, farmers, reelers, and weavers with sericultural experts. The same is achieved by means of real time data, audio and video streaming or to be precise a smaller version of videoconference utility. CSB is with its IVRS has substantially achieved this. However, role of Kiosks is due in this regard

Collect data on day-to-day activity

Sericulture involves various activities at stages to get a finished product, as data of such activity on a real time basis will help experts to evolve new techniques or even develop a high end computing system that can provide instantaneous solutions for many problems. To

Seri-Information Kiosk development flow and actual development flow adopted for developing Seri-information Kiosks



come out with such system, data collection from various end users at stages is needed; Seri-information kiosk can be the neural hub for such exchange of data and also provide complex computing analysis reports to the needy.

The following are the main steps in the evolution of Seri-information Kiosk:

- Data Identification
- Data Collection
- Data Manipulation
- Iterations
- Design
- Design implementation
- Programming
- Dynamic content programming
- Voice Scripting
- Voice Script Iterations
- Voice over artist screening
- Voice recording
- Voice editing & Sound mixing

- Video editing
- Sound clip editing
- Final Integration
- Testing
- Implementation

Features of Seri-Information

Seri-Information Kiosk

- Touch screen enabled information outlet
- Bi-lingual (English with State languages)
- Topics covering almost all sectors of sericulture
- Effective bi-lingual voiceover presentation
- Video streaming for effective information dissipation
- In-depth photos to depict sericulture activities and products
- Real time sericulture market trends
- Forewarning System
- Sericulture related product Ad's
- FAQ's to provide in hand support to sericulturists
- Easy one touch contact ■

Commissioned Studies/ Papers

Indian Journal of Science Communication encourages potential scholars to undertake short term studies/research / surveys on specific area / topic / sector concerning S&T communication. It is expected that such studies will also lead to writing of a paper / article and can subsequently be published in *IJSC*, if found suitable. A committee of experts will evaluate and recommend carrying out of such studies. A nominal amount towards honorarium may be granted for undertaking such studies.

Proposals, including information pertaining to title of the study, scope and objectives, methodology, expected outcome, budget estimates and time schedule, etc., may be sent to the Editor, *IJSC*.

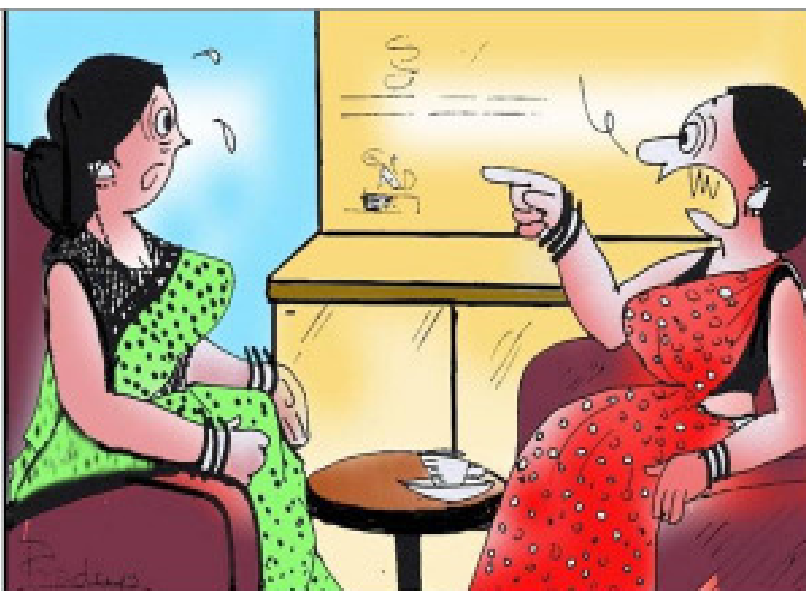
Scientoon

Insect identification is an increasingly common hobby, with butterflies and dragonflies being the most popular.



“So what if I had not studied Entomology? Now I know which butterfly you are identifying.”

If you live any of the **metropolitan city of India**, the smoke you inhale due to air pollution, is equivalent to smoking 10-20 cigarettes a day which may be hazardous for your health.



“You cheated me! My daughter will never marry your son. It's Ok that he doesn't drink, smoke or take any drugs, but why did you hide this fact that he lives in Delhi?”

Science popularization in Urdu

Dr. Asad Faisal Farooqui

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In India, Urdu journalism started in 1822 when India's first weekly Urdu newspaper "*Jam-e-Jahan Numa*" published from Calcutta (now Kolkata). Since its inception, Urdu journalism has witnessed many ups and downs. Since the first war of independence in 1857 up to India's freedom in 1947, Urdu journalism espoused for the cause of freedom and national integrity. From the very beginning, Urdu journalism took pains in popularizing science, health, and technological advancements issues. Not only did the first Urdu newspaper "*Jam-e-Jahan Numa*" published scientific and development news in an interesting way, but also it did use pictures for better understanding of readers. One such developmental news with heading "*Dhuayn ka Jahaz*" means steam ship which was published in the *Jame-Jahan-Numa*. (issue No. 131 of December 28, 1825) and another such news with heading "*Dakhani gari*" steam car or motor, published with a picture in the issue of July 22, 1828.

This is true that in India, scientific and developmental journalism in vernacular languages started in 1818 when "*Digdarshan*" a magazine published some scientific and developmental articles also in Bengali and Hindi besides English languages, and some of the translated scientific books were also published in the second and third decade of the nineteenth century. In Urdu, work of science and developmental journalism can be divided into four stages:

- 1 Stage First: 1822-1857
- 2 Stage Second: 1857-1900
- 3 Stage Third: 1900-1947
- 4 Stage Fourth: 1947-till now

1. Stage First: 1822-1857

By going through the history of journalism, old magazines and early printed works available in the

oriental libraries, we found that the "*Khair- Khwahe-Hind*", published from Mirzapur in 1837 covered the science news and published the scientific and technological articles. Some files of this magazine are preserved in the India Office library, London. The main purpose of this magazine was to promote Christian religious dogma but it also published scientific and developmental articles.

Old Delhi College, its principal Mr. Springer, and one of its ex-students named Master Ramchander (later teacher of European science in same college) made tremendous efforts in promoting and popularizing science and developmental activities. They did outstanding work to promote science journalism in Urdu and developed Urdu as active and practical language. Mr. Springer started a scientific and educational magazine namely "*Qiran us sadain*" in January 1846 which promoted and developed the scientific approach in the teachers and student community of the college. He also established an organization in the college campus known as "*Anjuman Majmae Fawaied ul Alam*". Under this organization, many scientific and technological books were translated from English into Urdu and scientific terms in Urdu were also coined. Master Ramchander also took part in such activities. He also launched two scientific and developmental journals namely "*Fawaied Nazireen*" a weekly newspaper on March 22, 1845 and "*Muhibbe Hind*", a monthly magazine in October, 1847. The main purpose of these publications was to promote scientific outlook among the educated community of Delhi.

The trend of science publications started with "*Khair Khwahe Hind*" continued with vigour and till 1857. These days there were 10-15 magazines and weekly newspapers which covered science and technological development related stories and published the science as well as health science articles. A list of magazines and newspapers that devoted a good

percentage of space to science is given below:

- 1 **Sadar ul Akhbaar** : published by Professor C. Finik from Agra on March 6, 1846.
- 2 **Tohfatul Hadaiq**: published from Delhi College in 1848.
- 3 **Miraat ul Uloom**: published by Harbans Laal from Benaras in August 1848.
- 4 **Akhbaar Noorul Absaar**: Published by Munshi Sada Sukh Lal from Agra in 1851.
- 5 **Aftab Hind**: Published by Babu Kashi Daas Mitr from Benaras on January 1, 1852.
- 6 **Risala Tababat**: published by Dr. George Smith from Hyderabad on November 4, 1855. (Purely Allopathic and Modern Health Science Magazine)
- 7 **Khursheed Punjab**: published by Munshi Har Sukh Rai from Lahore in January 1856.

The main purpose of these magazines and weeklies was to popularize the knowledge of science among the educated people so that they think and work scientifically; hence superstition and blind faith from the society can be eradicated.

However, these early publications of Urdu, before Sir Syed Ahmad Khan's "**Scientific Society**" and "**Aligarh Movement**" played an instrumental role in the development of the society by promoting and popularizing science. These early informative journals helped in the development of Urdu language and new scientific words, terminologies were coined and used, but unfortunately these activities of popularizing science through publications got a set back and slowed down just after the first struggle of independence in 1857. Firstly, after 1857 hatred and anger against English people was prevalent among Indian masses which made them reluctant to accept these scientific publications. Secondly, English policies towards Urdu were also not favourable as Urdu was the main mode of communication in the revolt of 1857.

Nevertheless these early publications paved the way for future Urdu science and development journalism and today these publications are considered as milestones.

2. Stage Second: 1857-1900

After the first war of independence English policies towards India changed drastically and they used more power against the Indian masses and press. On the other hand, Indian masses especially Muslims expressed their anger against the European people and modern education (science and technology). This narrow

approach of Indian Muslims towards English and Modern education annoyed Sir Syed a lot. In 1863, circumstances compelled Sir Syed to come forward for the promotion of modern scientific education in Urdu. Thus he founded "**Scientific Society**" at Ghazipur. This society played an influential role in the popularization of science by scientific debate, science writings and scientific experiments. Not only this, the society also translated many scientific books into Urdu so that common people got benefited from these books. To popularize science education and to attract the people towards the modern education, Sir Syed published a weekly "**Akhbar Scientific Society**." This newspaper had tremendous influence on the society, journalism and politics of that time and changed the views and thinking of the public at large toward modern and scientific education.

In 1879 Sir Syed launched another magazine "**Tehzibul Akhlaq**" that used to publish three times in a month; it was designed to eradicate prevailing superfluous customs and ill practices found in Muslim masses all over country at that time.

Sir Syed's scientific society had made great impact on all sections of the society. After Sir Syed this endeavor many other educational and scientific societies were established in various parts of India to promote scientific thinking. Besides this, scientific societies also published their scientific and educational journal from various cities of India. Some of these important scientific journals and magazines which were part of science popularization and promotion are given below:

- 1 **Mazhar Ul Uloom**: pure science popular magazine published from Shajahanpur under the patron ship of Barrister R.F. Saunders in August 1868.
- 2 **Ganjina-e-Uloom**: pure science popular magazine published from Muradabad by Qazi Ehteshamuddin and Ganga Prasad in December 1868.
- 3 **Khadang Nazar**: literary and Scientific magazine published from Lucknow by Naubat Rai Nazar in September 1896. MaulanAzad wrote many articles related to science.
- 4 **Adeeb**: informative and Scientific magazine published from Ferozabad by Syed Akbar Ali Akbarabadi in January 1899.

3. Stage Third: 1900-1947

The beginning of 20th century saw a visible surge in the science journalism as this century unfolded a new

era of science and technological development. From the very beginning of 20th century new inventions, discoveries and innovations in the field of science started, scientific lectures, science exhibition and scientific debates were also held. Besides this, scientific and developmental magazines and journals were published. These activities popularized the rational and scientific thinking among the masses and made the world aware of scientific development. But in India the pace of these scientific activities was very sluggish including steps to enhance the promotion of science in Indian society.

Later on, initiatives taken by Maulana Abul Kalam Azad to popularize science through Urdu language fixed the imagination of Urdu knowing people. His scientific articles published in the early decade of 20th century in different informative magazines. They played a vital role in the popularization and promotion of science in the Urdu society. He had started science writing in 1901 through “*Al-Misbah*”, a weekly newspaper. He also wrote many science articles for “*Khadang Nazar*”, a monthly magazine published from Lucknow. He started his own informative monthly magazine “*Lisan-u-sidq*”, in which along with other purposes science popularization was also included. To popularize science among the masses, he published many science articles of eminent personalities in his magazines “*Al-Hilal*” and “*Al-Balagh*”. Maulana Azad, who began his science writing through “*Kadang Nazar*” had successfully carried out his work in “*Lisan-us-Sidq*”, “*Al-Nadawa*”, “*Al-Hilal*” and “*Al-Balagh*”. Maulana Azad was willing to continue this task meanwhile Indian scenario suddenly changed and freedom struggle got momentum. At this point, Maulana failed to control his emotions and jumped into freedom struggle with all the energies and sacrificed journalism for the sake of country.

The efforts and contribution of “*Jamia Usmania*”, one of the great seats of learning in the early 20th century (1917-1947) to popularize science through Urdu language could not be ignored. At the instance of Nizam-e-Hyderabad, under the patronage of Maulvi Abdul Haq, a “*Dar-ul-Tarjuma*” (Translation House) was set up at “*Jamia Usmania*”, Hyderabad. Under the umbrella of “*Dar-ul-Tarjuma*”, eminent personalities of science, literature, and linguistic gathered to coin the new scientific terminologies and to translate the books of different branches of science Viz. Chemistry, Physics, Botany, Zoology, Astronomy, Mathematics, Trigonometry, Geology, Geography and Engineering. First time in the history of India science education from 8th standard up to Ph.D. through Urdu

medium was initiated.

To promote and popularize science, to develop the scientific temperament among public, and also to make Urdu as a scientific and practical language, Maulvi Abdul Haq had played an important role. He published a tri-monthly (quarterly) magazine namely “*Science*” in Urdu under the umbrella of “*Anjuman Taraqqi Urdu, Hind*” in January 1928. This magazine later changed into a monthly and shifted its base to Delhi in 1938. The size of magazine was 22x7 sq cm, having 100 pages, its price was Rs. 8/- yearly and it was printed at Anjuman Urdu Press, Aurangabad.

“*Science*” was the first magazine of its own kind that requested a large number of distinguished and eminent European scientists for writing on science. Most of them took great interest of and appreciated the work and sent their articles, some of the eminent scientists who made their contribution for this important cause were: Dr. H. Frandish (Berlin University), Prof. Sir William Bragg (Royal Institute, London), Prof. E Adam Stroang (London) and Prof. Stean (Cambridge University).

“*Science*” not only published science articles but also carried science news, reviews of science books and also allotted a column for newly coined scientific terminologies. It also provided the pictures and graphs for the related articles. Unfortunately this magazine had to stop in the year 1947 due to the partition of India after accomplishing 20 years of great success. This magazine played a vital role in uplifting the society and disseminating scientific thinking.

Under the Stewardship of Maulvi Abdul Haq “*Anjuman Taraqqi Urdu, Hind*” did great job for the promotion of science in the first half of 20th century, a glossary of scientific terms for the first time in Urdu compiled by eminent personalities which was later published by “*Anjuman*”. “*Anjuman*” also compiled “*Istilahat-Ilmia*” scientific terminologies of Physics, Chemistry, Botany, Zoology, Geography, and Astronomy. Many scientific books were written and translated and later published in Urdu.

4. Stage Fourth: 1947-till now

After independence India’s first Prime Minister Pundit Jawaharlal Nehru and First Education Minister Maulana Abul Kalam Azad took great interest in research as well as promotion of science for the development of the newly independent India. They explored new avenues, provided bases for science research and presented a new spirit to science and technology. Pillars of today’s development in the field

of science, technology, information communication technology are erected upon the foundation which was laid by them for the building of Nation. Digital and broadcast media opened the new doors for promotion of science literacy in Urdu as well.

Contrary to this, after independence, science and technology communication and journalism did not progress in a desired manner especially in Urdu language; today the condition of Urdu journalism is not up to mark but the trends are changing in a progressive way. In last 63 years, we witnessed many popular science magazines in English and Hindi, there were only two popular science magazines and one newspaper viz. "*Science ke Dunia*" (Quarterly science magazine published by the Council of Scientific & Industrial Research, CSIR since 1975 from New Delhi) "*Science Urdu Monthly*", published Under "*Anjuman Faroghe Science*" by Dr. Aslam Parvez from Delhi since 1994. Another monthly popular science newspaper namely "*Science Aur Kainat*" is being publishing from Aligarh under the editorship of Asad Faisal Farooqui (the author of this work) since April 2005.

After 1990, many Urdu newspapers changed their get up, and allotted a page weekly for science, health and environment related articles and news. Newspapers which have been devoting a page for science are: "*Rashtriya Sahara*" (New Delhi), "*Inquilab*" (Mumbai), "*Siasat*" (Hyderabad), "*Etimaad*" (Hyderabad), "*Aag*" (Lucknow) and "*Qaumi Tanzeem*" (Patna). "*Qaumi Aawaz*" (New Delhi) was one of the mainstream and oldest national daily founded by Pundit Jawaharlal Nehru, devoted considerable portion of their space for science and technology popularization, has suspended its publication recently.

The literary and developmental magazines which have been regularly devoting a portion of it to science, health and environment related articles are: "*Urdu Dunia*" (New Delhi), "*Yojna*" (New Delhi), "*Tehzib-ul-Akhlaq*" (Aligarh), and "*Faisal-e-Hind*" (New Delhi). Besides these, many pure health science related magazines are also published regularly. They are: "*Al-Shifa*" (New Delhi), "*Fikr-o-Sehat*" (Rampur), "*Medical Zone*" (Bangalore), "*Nawai-tib-o-Sehat*" (Allahabad), "*Tarjuman Islahi*" (Mumbai), and "*Ahmad Times*" (Hyderabad). They promote and popularize health related issues in Urdu speaking society.

"*Nai Shanakt*", a computer and informational technology magazine is being published from New Delhi for last 8 years or so. For promoting small scale industries, to eradicate the unemployment and to

develop the society, an industrial and business related monthly magazine "*Rahber – Sanat-o-Tijarat*" is being published from Kolkata for some 37 years.

Today many government and non-government institutions and organizations have come forward for promotion of science in Urdu language. "National Council for Promotion of Urdu Language" (NCPUL) under Ministry of Human Resource Development, Govt. of India is one of the organizations that have compiled and translated many science and technology books. "NCPUL" also prepared "*Jamae Urdu Encyclopaedia*", under the chief editorship of Prof. Fazalurrahman, which was published in 2004. The 4, 6, and 7 Volumes of this encyclopaedia are devoted to different branches of science. Another organization which contributed prominently for promotion of science is "Centre for Promotion of Science", Aligarh Muslim University. This Centre also contributed a lot through writing, translating and publishing science books for Madarsa students. The Centre also organized workshops, seminars and popular lectures for Urdu knowing people.

"The National Council for Science & Technology Communication" (NCSTC), Department of Science & Technology, Govt. of India has already taken initiatives to promote science and technology communication in Urdu language, which included a project on "Origin & Evolution of Science Communication & Science Journalism in Urdu", as part of its countrywide programme on "History and Development of Science Communication and Science Journalism in Indian Languages", as well as organization of training courses on science communication and science popularization through Urdu, and has conducted a number of training workshops on science writing and science journalism in Urdu in different parts of the country. These efforts have encouraged and created a favourable environment for development of the cause of science communication through Urdu in the country.

Although, some positive steps have been taken for promoting and popularizing science, which greatly contributed to scientific development of the Urdu society but many more are still to be taken to reach the standard achieved by other language in the field of science and technology journalism and writing.

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International Hands-on Science Conference Calls for Innovation and Excellence

The 6th International conference on ‘Hands-on-Science’ (HSCI-2009) got off to a grand start at Gujarat Science City in presence of huge gathering comprising of eminent scientists and science communicators from India and board. The inaugural function started with lighting of lamp by the chief guest Padma Vibhushan Dr. Saroj Ghose, former Director General of National Council of Science Museum and architect of science museums and science cities in India. The function began with a welcome song by a dance group of students. Dr. Manoj Patariya on behalf of the organizing committee welcomed all the guests, delegates and participants. Dr. Patariya underlined the importance of Hands-on Science and said “Knowledge is important but more important is the best use of it”.

Guest of honor Dr. Sasa Divjak from International Hands-on Science Association discussed main goals of HSCI to develop scientific and technological skills through hands-on activities. Prof. Bruce Lewenstein, Director, Science & Technology Studies, Cornell University, USA shared his views and thoughts and opined that science is already a part of culture, but not an integral part of understanding. The conference newsletter “*Sci-Fun*” was released on this occasion. Dr. Saroj Ghose elaborated the concept of science and said “Science should aim for mental function and perception”. He highlighted various modes, like “Spark Theater”, Planetarium, and question-answer session, etc., for communicating science.

Prof. Ren Fujun, Director General, China



The inaugural session in progress

Research Institute for Science Popularization emphasized on science writing and poster competition as a means of expanding scientific paradigm. Prof. Roger Ferlet, France shared his ideas of promotion of scientific temperament as a duty of human being and there should be some



The grand beginning with the National Anthem

excitement through hands-on science activities rather than traditional lectures. Richard Pinner, a science dramatist from the UK expressed his concern for students who are running away from science streams. He stressed the importance of drama as an interactive tool of exploring scientific issues. Prof. L. Bachmann, University of Sao Paulo, Brazil highlighted the importance of seminars, conferences, etc., to popularize science. Mr. Raj Kumar, Secretary, Department of Science and Technology, Gujarat delivered his presidential address and stressed the need of hands-on science activities in imparting education and also elaborated utility of science city and science centre.

The scientific session-I entitled “Science, Innovation and Hands-on Science” was chaired by Prof. Shi Shunke and rapporteur was Dr. P.K. Singh. The session was conducted by Dr. M.A. Ansari. Prof. Shunke expressed his views on the theme of session and stressed the need that conference be performed at regular basis. He congratulated the Indian youth for their inquisitiveness towards science. Ms. Iryna Berezovska (Ukraine) presented her paper “Access to consumer health information: changes under influences of IT progress”. She explained about problem of cyberchondria among U.S. net surfers.

Mr. G. Rao emphasized the role and involvement of students in creating awareness about environment and presented a paper on “Next generation of environmental leaders”. Mr. Gabriel Luminea (Romania) presented a paper on “Plane potential fields: theoretical notions and experimental modeling”. He stressed over geometrical and magnetic field. Mr. Roger Ferlet, France presented his paper on the topic “Hands-on Universe” and described how science can be used as interactive astronomy. Mr. Tahid Ahmead, Bhopal presented a paper on “Hands-on science: in and out- a case study”. He presented his case study on Aero-modeling.



Dr. Saroj Ghose receives the hands-on science memento

In a parallel session, chaired by Dr. S.N. Ghosh, Mojca Sasek Divjak gave a presentation on Experimental models of urban sustainability based in indicators. Ms. G. Shankar in her paper explained how scientific and technological temper can be promoted by more exposure to practical.

The scientific session II entitled “Science communication through hands-on activities” chaired by Dr. P. Iyamperumal, and co-chaired by Prof. Sung Kyum Cho. The paper entitled “Earthquake resistant building” was presented by Mr. Soheb M. Salim (Qatar). He suggested the use of rubber base isolator might help in absorbing shock vibration of earthquake. Mr. Nihar Parmar presented his paper on “Evaluation of the Science Express”. Mr. D.K. Singh emphasized on the use

of visual science communication.

In a parallel session chaired by Dr. P.C. Vyas, and co-chaired by Dr. Maria Ines, Dr. Sanjeeta Gupta presented her paper on “Wood science research and education in India” and informed various utilities of the woods in society. Dr. Pallav Mukharjee showed various experiments while presenting his paper on “Developing Scientific concepts on hydraulic using waste materials”. Mr. L.D. Kala, IIT Delhi discussed how hands-on science can help towards the total knowledge transfer for S&T communication. Dr. Kathan Kothari explained various useful aspects of astronomy with special emphasis on Camel cart.



A serious discourse

In the session III on “Experience in science fun learning” chaired by Dr. M.N. Humbarde, and co-chaired by six papers were presented by young researchers. In a parallel session chaired by Dr. A.P. Kulshreshtha, Dr. L. Carvalho, Ms. B. Rangachar, Ms. Shivangi Pandey, Dr. Sudesh Ghoderao, Mr. B. Upadhaya, Mr. Amit Soni and Mr. Irfan Human made their presentations. The session concluded with a thought provoking evening talk by Prof. B.V. Lewenstein on “Learning science in informal environment”.

Some 30 posters were demonstrated as part of a hands-on exhibition, covering varied issues, i.e. science communication, sono-chemical aldol, multipurpose stove, rain water harvesting, robotics, and visual illusion, etc. A young scientist Mariyar Darmi came up with an idea for protecting ozone layer by using a small apparatus which can absorb fumes of incense sticks within seconds. Science communication through theater arts was presented

by Ms. Pooja Virmani. An initiative made by Mohit K. Jolly, a student of IIT Kanpur, to bring out a science magazine. Ms. Shikha Pandey attempted to educate masses about various aspects of food adulteration along with safety measures.



Science with culture

A hands-on science exhibition presented a range of activities to educate the audience, including a complete package of scientific models, tools and toys, etc., based on scientific themes. Participants from India and abroad took active part with zeal and enthusiasm. Other attractions were: hydroponics, robotics, joy of chemistry, organic architecture, explaining miracles and exposing superstitions, hands-on mind-on.



Poster session

Mr. Ramesh Parmar astonished everybody by his amazing calculation skills of Vedic

mathematics. Mr. Raman Bhai presented his concept of using traditional toys for communication of scientific topics, like sound, light, etc. An interesting display of science communication using puzzle game (hands-on mind-on) was done by Mr. H.R. Shishodia. A science shop was available for delegates to provide books, toys, telescopes, instruments, games and puzzles, etc. A solar-rickshaw was an added attraction for the participants.



I'll try this!

In addition, there were split group discussions in 5 different groups on the themes emerged out of different technical and thematic sessions, i.e. i) How Hands-on Science can form Part of School Science Curriculum; ii) Hands-on Science for Developing World; iii) Practicing Scientific Temper and Technological Temper; iv) Confluence of Hands-on Science with other similar efforts; and v) Hands-on Science: The Way Forward.

Five days long HSCI-2009 ended with a call to the scientific community to take science to people and “Hands on Science” could be a viable approach to make science people friendly at large. Prof. Bruce Lewenstein appreciated the joint effort of the entire young and senior scientists for the cause of science communication. Prof. Cho from South Korea expressed his joy and thankfulness for participating in this international scientific

convention. Dr. Madhu Pant expressed her satisfaction over the proceedings of this conference for being more innovative and creative to target the society and especially children. She stressed that



The inventor Dr. Sinha with his solar-rickshaw

science communication needs no equipments, it can be done by the synchronizing 3H (Head, Heart and Hands). Dr. V.B. Kamble, Vigyan Prasara



It works!

appreciated the interaction of young scientists with senior ones and this innovative effort. Dr. R. Sreedhar, Director, Commonwealth Educational Media Centre for Asia said “I am extremely happy

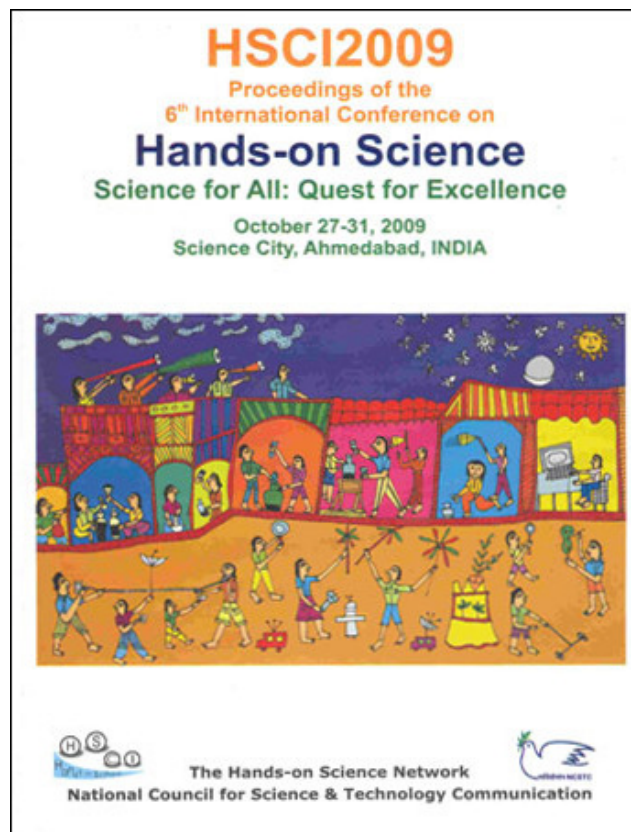
to note the enthusiastic response from youth of India in science communication. The dream expressed by Pt. Jawaharlal Nehru and nurtured by a countable number of science communicators is coming true. I think the starting of science communication courses by NCSTC in various universities has done the magic”.



HSCI Chair Prof Costa at valedictory function

UNESCO-Kaling prize winner for science popularization and noted geneticist Dr. D. Balasubramaniyan, Director (Research), L.V. Prasad Eye Institute, Hyderabad, was the chief guest at the valedictory function. He gave an illuminating talk on “History of genetics - Past and present” and lucidly explained the history, and mystery of genetics as how human beings are genetically common to variety of animals like bacteria (40%), dogs (60%), horses (80%), monkeys (90%), baboons (98%) and chimpanzees (98.5%). He thus reiterated that despite being so much diversity among human beings the world over 99.9% DNA is same in all the human races.

Prof. Balasubramaniyan also released the proceedings and DVD carrying papers of HSCI-2009. “magic”.



HSCI 2009 proceedings

Prof. Manuel F. Costa, Chair, HSCI-Network gave his valedictory address appealing the scientists to bring science to all and enhance scientific temper in the society to enhance science education. A “Hands-on Science India Declaration 2009” was also adopted by all present on this occasion.

It presents strategies for S&T communication, new direction for science outreach activities, important collaborations, activities, and policies. Over 300 scientists, science centre experts, communicators, faculty members, students, and media persons from all over the country and 20 countries participated.

[Dr. A.K. Sharma, Director, Institute of Mass Communication in Science & Technology, Lucknow University, Lucknow; and Tarun K. Jain, Editor, Vaigyanik Drishtikon, Tagore International School, Mansarovar, Jaipur] ■

Northeast hosts the Indian Science Communication Congress for the first time

The 9th Indian Science Communication Congress (ISCC 2009) was organized for the first time in the entire northeastern region of India. The main aim of the ISCC 2009 was to focus on the meeting point of science and communication which will be for the benefit of the society. The Congress was organized by the National Council for Science & Technology Communication (NCSTC) under Ministry of Science and Technology, Govt. of India and Krishna Kanta Handique State Open University, Guwahati, Assam in collaboration with Indian Science Writer's Association (ISWA), New Delhi. The NCSTC, Govt. of India, has been organizing ISCC since the last eight years. The ISCC started from the year 2001. The meet has been organized in several cities, like Lucknow, Ranchi, Visakhapatnam, Gwalior, Varanasi, Ahmedabad, New Delhi and Chennai. The 9th Congress was organized at Guwahati.

The 9th Indian Science Communication Congress focusing on the theme "Science meets Communication" began on 20th December 2009 with an introductory evening session on popular talks on science communication at the auditorium of Don Bosco Institute, Kharghuli. The distinguished speakers for the session were Dr. Manoj K. Patariya, Director, NCSTC, Prof. Bijay Krishna Dev Sarma, Retd. Professor, NEHU, Shillong, Prof. P. Thirumal, Associate Professor, Hyderabad Central University and Sri Biswapati Mukherjee, *Science and Culture*, Kolkata. After the felicitation of the guests, the session began with the welcome address by Sri R.B. Mahanta, Registrar, K K Handique State Open University. This was followed by the address of Dr. Manoj K. Patariya, who stressed on the necessity of 'marriage' between science and communication for successful science communication.



Hon'ble Chief Minister of Assam Shri Tarun Gogoi inaugurates ISCC-2009; Prof. Srinath Baruah, Vice Chancellor; Dr. Ankuran Dutta, Academic Consultant; and Sri R.B. Mahanta, Registrar, K K Handique State Open University join the ceremony

In his speech Prof Vijay Krishna Dev Sarma said that science communication is not an easy task because general people have wrong notation about science. For effective communication of science it is very important to keep in mind the nature of the target group.

Prof. Biswapati Mukherjee who also delivered his lecturer spoke on the psychological approach of oral science communication. Dr. P. Thirumal spoke on issues relating to the institutionalizing of the scientific profession and legitimacy of the discipline. Dr. Madhab Ch. Sarma, Director, Centre for Internal Quality Assurance, KKHSOU also spoke on the occasion.

On 21st the inaugural session began with Saraswati Vandana. Professor Srinath Baruah, Vice Chancellor of KKHSOU delivered the welcome address which was followed by the ceremonial lightning of the lamp by hon'ble Chief Minister of Assam, Shri Tarun Gogoi. Shri Gogoi in his speech pointed out that the problems of unemployment, illiteracy and poverty can be redressed with the implication of technology.

Chief Guest, Prof B.P. Sanjay, Vice Chancellor of Tamil Nadu Central University spoke on the challenges of science education as a career. He commented that the challenge before the state open and central universities was how they could meet the prospects of coming up with new science based programmes.



*Dr. Manoj Patariya, Director, NCSTC/ DST
lighting the lamp*

Dr. Manoj Kumar Patariya, Director NCSTC termed the Indian Science Communication Congress as an opportunity to invite and involve the people of different strata of society for solving problems with the help of scientific temper. His idea is to bring scientist and communicators together for the purpose. On this occasion Prof. Vijay Krishna Dev Sarma and Prof. Dinesh Ch. Goswami both leading science communicators of the region were felicitated. The

session ended with the vote of thanks by Dr. Ankuran Dutta, organizing secretary of ISCC, 2009.

The technical session I was based on the sub theme: ***Bridging the gap: Scientist and the masses***. This session was chaired by Prof. Soneswar Sharma, renowned science communicator and professor of Gauhati University. Five papers were presented in this session. The first paper was entitled 'the religious places as a new concept to develop the scientific temper' by Abhijit Vinay Singh Rathore. Mr. K. Mohan presented a paper entitled science communicator's role in bridging the gap between science and masses. Mr. Bala Lakhendra's paper entitled community radio: an important tool for science communication and social development was well received, while Anamul Hoque Sadiyal presented his paper on impact of information and communication technology.



Hon'ble Chief Minister delivers inaugural address

After the session, there was a special talk on science journalism by Prof. B.P. Sanjay, Vice Chancellor, Tamil Nadu Central University. In his talk Prof. Sanjay deliberated on the scenario of journalism education in India and the challenges faced by journalist with regard to science communication.

The 2nd session was based on the theme: ***Science in media: Development communication and scientific awareness***. The session was chaired by Professor Biswapati Mukherjee, Indian Science News Association, Kolkata. The first paper was presented by Shri Bimal Krishna Sarma on role of media in creation of awareness about health and hygiene among urban poor with special reference to Guwahati city. Mangesh Karandikar's topic was vanishing in space and time why science gets lesser representation in the media. He pointed out that scientist are unable to communicate in a simpler language, reporters' lack of scientific knowledge, and training could be a solution.

Motilal Verma suggested *Vigyan Darshan* through live TV. Mass Media's edge over Tobacco Tyranny by C. Shree Prapanch enthused the delegates. This paper recommended coordinated ways to combat the ill effects and to create awareness across various sections of the society. The final paper was presented by Pumoni Kalita on communication for health awareness. The paper discussed the key issues of selecting the appropriate channels of communication for health communication.



Hon'ble Chief Minister honours distinguished experts

The 3rd session focused on the sub theme: ***Science and technology journalism to enlighten the society***. The session was chaired by Prof. Ram Mohan Pathak, professor of Madan Mohan Malavya Institute of Hindi Journalism, M.G. Kashi Vidyapeeth, Varanasi. Four papers were discussed in this session. Sanjay Verma spoke on media science and expanding frontiers and Ananya Bordoloi talked on journalism in the digital environment. Himangshu Goswami shared his views on coverage of science and technology: the case of present day Assamese dailies. The last paper of the session was presented by Bharati Bharali on science and technology communication in print media of Assam, a study of the English press since 1980.

The fourth session focused on the sub theme: ***Science illiteracy: Innovative approaches to address the issue***, and the fifth session on the sub theme: ***Science communication in regional languages***. The fourth and the fifth sessions were combined and chaired by Mr. V.P. Singh, Executive Secretary, Indian Science Communication Society, Lucknow and Prof. Partha Chatterjee, former Dean of Assam University, Silchar.

Some important papers presented in this session were- different approaches of science communication by Amit Kr. Jana, Role of print media in effective

communication for social development by Radhe Shyam Purohit, and communicating science through radio: a case study of All India Radio, Shillong by Mrs Krishna Dasgupta.



Prof. Srinath Baruah, Vice Chancellor, K K Handique State Open University honours Dr. D.C. Goswami, a noted science writer

The sixth technical session was under the sub theme: ***reaching the unreached: science through distance learning***. This session was chaired by Dr. H.P.S. Walia, Associate Professor of Punjabi University, Patiala and Dr. M.C. Sarma, Director, CIQA, KKHSOU. The first paper was presented by Mangesh Karandikar on behalf of Daivata Chavan Patil entitled participants' interactions structure in the virtual science community. A paper entitled science communication in distance mode application of ICT was presented by Dr. A.C. Bora. Queen Sarma on the role of ICT in delivery of science programs: KKHSOU perspective. Delivery support services in digital learning environment: prospects and challenges was the topic covered by Trisha Duarah Barua. Meghna Choudhury presented her paper on bridging the gap in science communication in context of middle and higher secondary schools in Guwahati.

The final technical session was on the sub theme: ***resistance to scientific temper***. This session was chaired by Prof. Sanjiv Bhanawat, Professor and Head, Dept. of Mass Communication, Rajasthan University, Jaipur. The first paper of the session was presented by Anjuman Borah on the theme gender implications of superstitions: Strategizing alternative media for persuasion. The presenter focused on Witch: Hunting as a social problem requiring alternative media interventions for persuasion. Role of media in undue publicizing superstitions: some case studies was the paper presented by Dr Subhas Debnath. A paper

explaining the scientific principles involved in miracles and eradicating myths and superstitions in rural area was presented by K. Tolendra. His magic performances explained the science behind so-called miracles.



A musical evening at ISCC-2009

In the evening there was a popular talk session on science communication. The speakers spoke on various issues of the focal theme: **Science meets communication**. Speakers amongst others included Prof. Arup Kr. Mishra of Assam Engineering College, Prof. Sanjeev Bhanavat of Rajasthan University and Prof. Partha Chatterjee, Kolkata.



Dance as a means of communication

One of the seven technical sessions, one session was fully dedicated to young researchers and students. On 23rd December around 20 young researchers delivered their presentation on different issues of science communication. The session was presided over by Prof. Robin Goswami, Senior Consultant, KKHSOU. In addition there was a vibrant round table discussion.

The valedictory functions of the ISCC 2009 was held on 23rd December 2009. The session was chaired by Prof. Srinath Baruah, Vice Chancellor, K K

Handique State Open University. Dr. V.K Srivastav, Vice President, ISWA, Mr. Tariq Badar, Secretary, ISWA, Sri R.B Mahanta, Registrar and Dr. M.C Sarma, Director CIQA and OSD (Academic), KK Handique State Open University were amongst the dignitaries at the function. Ms. Birubala Rabha, a crusader against witchcraft was felicitated for her courageous journey against witchcraft on the occasion.



Prof. Srinath Baruah and Dr. Manoj Patariya address the Press Conference

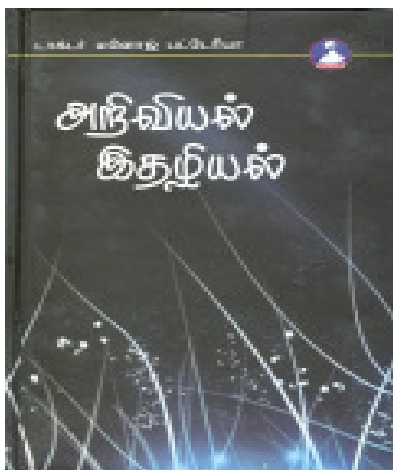
A variety of cultural evenings while presenting a rich cultural heritage of Assam have added colours to the conference to make it more memorable to the hosts and participants. Field visits were organized for the participants on 24th December 2009, one local visit to Guwahati and other to Shillong. Some 180 delegates actively participated in the congress from all over the country.



The grand finale of ISCC-2009

[Dr. Ankuran Dutta, Associate Professor, K.K. Handique State Open University, Dispure, Guwahati, Assam] ■

Ariviyal Ithazhiyal: A book on science journalism in Tamil



*Ariviyal Ithazhiyal by Dr. Manoj K. Patariya
(Tamil versioning by Prof. L.V.K. Sridharan)*

Science journalism will promote scientific temper and awareness, and eliminate superstitious beliefs, and enhance scientific knowledge, said Dr. T. Ramasami,

Secretary, Department of Science and Technology, Govt. of India at a book release function held on October 2, 2009 on the occasion of the birth day of Mahatma Gandhi, at Anna University, Chennai. Dr. Ramasami was delivering a lecture on the occasion of the release of a book on science journalism in Tamil “**Ariviyal Ithazhiyal**”, a Tamil version of Dr. Manoj Patariya’s book on science journalism “Hindi Vigyan Patrakarita”.

Dr. Ramasami said ‘I am happy to say that the book is going to be available in many Indian languages and will be serving as a resource on the subject to help science journalist fraternity to bring about positive changes the way science is reported and finds space and time in mass media’.

Madras High Court Judge Justice M. Chockalingam emphasised the need to follow science journalism in Tamil with utmost care and take science to the common man. The event was jointly organised by the Department of Media Sciences, Anna University, Nehru



Dr. T. Ramasami, Secretary, DST lighting the ceremonial lamp

Yuva Kendra, Ministry of Youth Affairs and Sports, and the Alliance Company, publisher of the book.

Justice M. Chokalingam said 'I am sure, the present Tamil version will be welcomed by one and all as its other languages' versions and editions were largely welcomed. Collectively, we should create a new wave of qualitative science journalism in the country, and this effort in the form of this book is going to form a firm base for it'.

The book Hindi Vigyan Patrakarita by Dr. Manoj Patairiya was first published in 1990 incorporating a chapter on science journalism in Indian languages including a major portion in Tamil. Since then, a number of activities have taken place and varieties of publications have been brought out. Science communication and science journalism have also seen a number of new trends and have been evolved tremendously to cater to various cross sections of the society. However, always remains scope for creativity and progress to achieve accomplishment in any area so as in science journalism.

The present Tamil version of the book is an attempt to spread the understanding of science journalism in general and imparting knowledge of the subject in particular, especially those who are in search of such

material and want to shape their career or profession in science journalism or science communication.

The book being the first of its kind propagates the concept of modern science journalism in the country. The author Dr. Manoj Patairiya is known for his monumental contribution to the field of science journalism and science communication not only in India but also in abroad.

The Tamil versioning was done by well-known Tamil-Hindi scholar Prof. L.V.K. Sridharan, Loyala College, Chennai, who deserves commendation for volunteering and taking pains for translating and transforming the book into its present form for the benefit of Tamil readers. The publisher is equally regarded for coming forward courageously for publishing the book on such a narrower subject especially in a highly volatile market.

The foreword of the book was given by Dr. T. Ramasami, Secretary, Department of Science & Technology, Govt. of India, which observes: "A general statement spread all over the world that scientists are the best citizens of the world. Economic progress of developed countries can be seen in today's scientific achievements. Most of the books and articles in science are written generally in English or European languages. Because of that the development of science is



The book Ariviyal Ithazhiyal unveiled

depending on a particular sect of people only. If the scientific awareness and scientific temper are to reach the entire society, language should not be an obstacle for that. There is a common opinion of many experts that if the farmers and general public are to enjoy and experience the development of science, then it should be communicated into their own language so that they can understand and realize the same'.



Justice M. Chokalingam, Madras High Court Judge lighting the lamp

The dignitaries amongst others included Dr. Nellai Sumuthu, Senior Scientist and Science Writer, Vikram Sarabhai Space Centre, Sriharikota, Dr. Muthu Vellu, International Centre for Tamil Studies, Prof. Arul Aram, Head, Media Studies, Anna University, and Mr. V.



Dr. T. Ramasami releases the book and presents the first copy to Justice M. Chokalingam

Srinivasan, the Alliance Company. Over 300 scientists, faculty members, writers, journalists, civil society members, NYK coordinators, and students, etc., attended and witnessed the book release ceremony. Dr. N. Murugan, Deputy Director, All India Radio was the

master of the ceremony and conducted the programme as per schedule.



Science communication and mass communication students attend the function

The book is published by Alliance Company, the oldest Tamil publishing house, has standing of 110 years from its inception, and had been associated with country's freedom movement and published many patriotic books, and received appreciation from the Father of the Nation Mahatma Gandhi, Nethaji Subash Chandra Bose and many other national leaders. From the beginning, it has been publishing books on various subjects, which include science and technology, and now the new addition on science journalism will help eliminate superstitious beliefs and promote a scientific outlook.



The programme attracts a house full

[Mrs. Rajeswari Murugan, Former General Manager, BSNL, C-13, Nest Chaitanya Apartment, 9 Ratna Nagar Main Road, Teynamt, Chennai 600018] ■

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