

# Indian Journal of Science Communication

*Communicating Science of Science Communication*

**Assessing the coverage of development news  
in contemporary print media**

**Understanding science communication in current context**

**Information technology: Revolutionizing communication**



**AASSA-INSA-NISCAIR Regional Workshop on SHARE Communication**

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# Science Diplomacy: Communication for international cooperation



*Scientific collaboration and cooperation between various countries had been a vital phenomenon for bilateral and multilateral relations in modern times. India, for instance, has bilateral cooperation in science and technology with over 90 countries and promoting science diplomacy. Communication and sharing are some of the important aspects for these relations especially when it comes to getting advantage out of such collaborations as each country seeks to extract the best for it! The ability to allowing the partner country the best without loosing our best at equal level holds the key to diplomacy. Science diplomacy is a kind of scientific collaboration among nations to address problems and issues of mutual interest and to develop constructive international partnerships. Science diplomacy is considered as an umbrella term to describe different formal or informal scientific, research, academic or technological exchanges for overall well-being of nations, societies and people. Science in diplomacy is where science can provide advice to inform and support foreign policy objectives and scientific cooperation improves international relations to bring in synergy. Diplomacy in science is where diplomacy can facilitate international scientific cooperation. Science diplomacy dates back to 1931 when the International Council of Scientific Unions (ICSU) was created. The civilian scientific exchanges between US and then USSR keep aside cold war through science diplomacy and started working together on scientific collaborations. The African Scientific Institute was created in 1967 to connect African scientists to their counterparts in other countries. European Organization for Nuclear Research (CERN) is yet another example of growing multilateral science diplomacy, came to limelight for discovery of Higgs-Boson.*

*The National Institute of Science Communication and Information Resources (CSIR-NISCAIR) has ventured into publication of a quarterly digest “Science Diplomacy”, which is an effort to share top scientific research, technological advancements, innovations and key policy aspects with different nations especially who have science and technology cooperation with India, in major foreign languages and vice-versa. Something like 22% Indian research papers are an outcome of collaborative research with different countries. The engagement of our researchers with their counterparts in these countries shows the growing science diplomacy that India enjoys with many countries. Science Diplomacy” is one of the recent initiatives to communicating and sharing science to all stakeholders and promoting science outreach and public engagement. “Science Diplomacy” offers a platform to broaden and strengthen science and technology cooperation further.*

*Dr. Harsh Vardhan, Science & Technology, Earth Sciences, Environment, Forests & Climate Change Minister of India, besides Mr. Abdul Latif Roshan, Higher Education Minister of Afghanistan and Mr. Yafes Osman, Science & Technology Minister of Bangladesh, released the first issue in Japanese-English at the 3<sup>rd</sup> India International Science Festival, Chennai on October 13, 2017. Much of the high quality scientific research gets highlighted mainly through English journals published in India and abroad. A new avenue for taking the results of Indian scientific research abroad can be opened up if the research output are conveyed in some of the major foreign languages as well in the form of a digest to be available in major foreign languages besides English and Hindi. Science could thus be harnessed as a diplomatic wedge benefiting English as well as non-English audiences across the globe by disseminating selected scientific breakthroughs and connecting larger stakeholders both in English and non-English speaking nations to Indian science. Diplomatic missions, research and development organizations and institutions, science academies, universities, libraries and mass media, etc., in different countries will get such important content in their respective language(s) in both print and online versions. The introductory issues published in Japanese-English to begin with and subsequently will be made available in other foreign languages, i.e. Chinese, French, German, Russian and Spanish; other languages may be added depending on the need and feasibility.*

*An assessment shows the uniqueness of the project that has the potential of further collaborations especially for language versioning and dissemination in different countries. Intellectual activities can find new frontiers through cooperation and collaboration to contributing to better quality of life through effective diplomatic efforts in science and technology. Sharing the excitement of creation as well as new exploration or understanding lead to joy of innovation. Collective problem solving approach results into sheer delight and collaborative thinking makes it possible. The sheer delight of creating new knowledge gives a boost to further research at bench level and promotes the intellectual delight. However, the profit considerations out of sheer intellectual delight apparently become business and tend to take a different shape. “Science Diplomacy” in major foreign languages and vice-versa would promote frequent and smooth exchange of information, better understanding and stronger ties between partnering nations.*

**Prof. Dr. Manoj Kumar Patairiya**

# Assessing the coverage of development news in contemporary print media

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## Introduction

Development communication is an important area of studies in the academics of journalism and mass communication. Newspapers are required to provide developmental information on local, state, national and world issues. Today, newspapers use designs and graphics that make information easily visible and interesting. Important stories get special typographical treatment and are therefore set in large bold headlines, while rich graphics accompany the stories enhancing its readability. The history of modern times is the history of development. Development is a whole and integral, value loaded cultural process which encompasses the natural environment, social relations, education, production, consumption and overall well-being. It involves a process of transformation of a traditional society to a modern society. The most important feature of development is growth. From a social point of view, development refers to the change in the social structures or in the functions performed by different groups and units within it. Today, press or media is widely considered important tool for development, and modern day development is communication oriented. There is a very close relationship between the press and development of a country. Press has an impact on society not only through the content of the message but also through the process. It plays a crucial role in creating awareness among people as well as in changing public opinions. Development is a complex phenomenon and development communication is the systematic use of communication for national development.

The term “development communication” was first coined in 1972 by Nora C. Quebral, who defines

the field as “the art and science of human communication linked to a society’s planned transformation from a state of poverty to one of dynamic socio-economic growth that makes for greater equity and the larger unfolding of individual potential.” Development communication is the integration of strategic communication in development projects. Strategic communication is a powerful tool that can improve the chances of success of development projects. It can also be defined as organized efforts to use communication processes and media to bring social and economic improvements.

Communication is an integral part of development process. Keeping in view this fact, the importance of communication was recognized in our society years before. Several organizations are working in this area at national and international level. The earlier literature suggests the development communication has been very important area of study. Daniel Lerner, Everett Rogers, Wilbur Schramm and Pye Lucian have done remarkable work in this field. Today, with increasing dependency on mass media, including new information technology has become more important than ever before. Similarly, the number and area of development programmes have significantly increased. The success of any programme depends on the strategic use of mass media as well. Whether mass media play their role in an effective manner? Whether mass media informing people about various schemes going on for them? How are newspapers giving information about those development programmes which are implemented in different areas for the public good? These are some such questions which are relevant and need to be analyzed; hence this study.

## Review of literature

The review of literature related to development communication suggests the need of such a study about coverage of development issues. Most of the earlier studies showed unsatisfactory coverage of development issues especially in print media. However, some small newspapers have done remarkable job in the field of development communication. *Gaon Connection* is an online newspaper that focuses on rural development news. *Khabar Lahariya* is a weekly rural newspaper written, edited, illustrated, produced and marketed by a group of some 20 women, most of them from marginalized communities, at Chitrakoot and Banda Districts of Uttar Pradesh, playing important role in the coverage of development news. Vilanilam, J.V. (2009) says that development issues in the media, which need to be addressed, are not enough.

## Objectives

1. To find trend of coverage of development programmes initiated by government in newspapers pertaining to health, environment, rural development, agriculture, women empowerment, science and technology, etc.
2. To analyse which areas of development get more coverage as compared to others.
3. To analyse how development news are given priority on front page of a newspaper or headlines of a newscast.

## Research design and methodology

The research approach involved content analysis of *Hindustan* and *Dainik Bhaskar* (Hindi dailies), *Times of India* and *Hindustan Times* (English dailies), *Gaon Connection* (online rural newspaper). The content analysis was undertaken mainly in qualitative manner through observation method. Samples of these newspapers (August-September 2016) were randomly selected for the study. All pages except sports, business and economics have been taken for the purpose of the study. All the stories of the selected issues were analyzed. This study has taken the coverage of only those programmes which are directly related with development activities implemented by the state. The following points were tak-

en into consideration during the course of the study:

1. What are the development themes covered or reported in newspapers?
2. What are the forms of newspaper reporting, such as - news, editorial, feature, analytical, opinion or column?
3. What is the position or placement of the news item in the newspaper?

## Analysis and discussion

The observation of contents of newspapers gives a very dismal and gloomy picture of the coverage of development issues and topics in the newspapers. Crime, sex, violence, accidents, forgery, sports and politics cover the maximum space in the print medium. Even problems of various sections of the society have been highlighted in comprehensive manner. The information about various government schemes and development programmes are rare. The quantitative data gives precise figures on the attention that development issues received from media during two-months' period.

**Newspaper trends:** There were 32 entries on the list, health and agriculture covered 4 stories each. Science and technology had 5 stories. Social and economic development had 5 stories in all. Whether some particular development areas more newsworthy than others? Why some areas receive greater levels of newspaper attention than others? Some areas, such as, dairy development, water management received a little space in newspapers. Table illustrates the areas getting coverage across different newspapers. Development stories get little or no attention from newspaper editorials, a major finding suggests that a low value is attached to coverage of these stories by newspapers in general. Generally a newspaper gives coverage to those development stories which came in controversy in any way. There is hardly any story about development programme on the front page of the newspaper. There is no question on giving follow up of any development programme. Following is the subject wise brief analytical report of coverage of development news in the newspapers. The 'genre' also dictates the average length of a relevant piece to a certain extent. The most common article size for the whole sample is between 201 to 500 words. The

Sunday editions tend to have longer articles than daily newspaper articles, perhaps analyse issues and explore detailed information.

**Health:** Health is an important area of development issues where a large number of programmes are being conducted both in rural and urban areas. Health communication encompasses the study and use of communication strategies to inform and influence individual and community decisions that enhance healthy living. Several initiatives and programmes for almost all sections of society were observed. However, the report of such programmes in newspapers are rare. A weekly page on health appears on Wednesday with the editorial page, though it does not inform about development programmes conducted in health sector by the state. On 14 August *Hindustan Times* published a news on Page 5 on government's initiative to stop abusive prescriptions by medicos, as many such medicines are addictive and pose serious threats to human health.

**Education:** Education is the only area where regular coverage is given on the city page of the newspapers. It reflects that education has become an important dimension of news reporting. Though, news content are of routine activities of universities and colleges normally related to admissions and other such affairs. On 3 August *Times of India* published a news on page 7 about government's approval of Higher Education Financing Agency (HEFA) to bolster creation of high quality infrastructure at premier educational institutions. This would benefit in developing labs and infrastructure at IIIs/IIMs/NITs and other such institutions. The news published on 6 September throws light on the problem of global warming as the headline says the rise in temperatures in the oceans has led to frequent occurrences of cyclones and typhoons. This raises concern over the global problem of climate change. All other samples taken for the study have given nothing about the programme going on in the field of education. The sample taken for the study suggests that the development programme in the area of education is neglected by the newspaper.

**Agriculture and rural development:** More than 100 agriculture programmes are going on in India. Mahatma Gandhi National Rural Employment Guar-

antee Scheme is a highly ambitious programme. The news about this programme is often related to corruption and irregularities in implementation. On 15 September *Gaon Connection* published a news regarding the low prices of DAP. Another news published on 20 September throws light on the dairy and need for indigenous varieties. The headline of the news "From Gokul village will get conservation for the indigenous varieties of cattle." In view of low internet speed, Google has come up with new YouTube version that can even work on slow internet. This news appeared on social media, then published on 27 September in *Gaon Connection*. A news published on 11 September in *Gaon Connection* portrays health services and related Start-ups. The news published in *Gaon Connection* on the 18 September shows a remarkable achievement in the field of agriculture, a new variety of lentil that matures in just 50 to 55 days, after harvesting the wheat crop, the size of lentil is also bigger.

**Women empowerment:** Women are moving ahead in all fields, be it science, sports, management or any other. The news of women accomplishments motivate other women to excel and break the barriers for development. The news published on 19 August in *Hindustan Times* on front page is a testimony to the fact that Indian women have got tremendous potential. The news about shuttler PV Sindhu got into Rio Olympic finals and wrestler Sakshi Malik bagged bronze got coverage on front page. Another news published on 4 September on Page 2 in *Dainik Jagran* talks about reservation of 33% women in police force. On page 2 another news published on same day focuses on the 'save the girl child campaign'. On 10 September a news published on page 2 of *Dainik Bhaskar* on women empowerment, five women PCR vans were started. Women personnel have got three months' training of driving, firing and combat skills. In another news appeared in *Hindustan Times*, the efforts of a women Sarpanch have achieved significant success in sanitation; a local news of Faridabad becomes global on women empowerment.

**Science and technology:** The news published on 9 September describes the launch of GSLV using indigenous cryogenic engine. A news published on 19 August in *Dainik Jagran* on Page 20 states re-

solving problems, such as drainage, sanitation and street lights, etc. A news published on 15 September in *Times of India* on page 11 reveals a success story “Indian techie does with radio what Marconi couldn’t”. The story is about Dinesh Bharadia, a teacher from Kohlapur, who turned radio communication into two way process, a problem that had stumped scientists for 150 years. A news related to a new initiative narrating a new research that could tell when any person died by studying RNA in heart and brain of a person, published on 24 August. This research is remarkable in the field of medicine and forensic science as it would be able to declare the time of death with more accuracy.

**Environment:** Conservation and protection of environment is an essential part of development. India holds a prominent position among 17 mega biodiversity countries with 7.8% of the recorded species of the world. The news report published on 6 September in *Gaon Connection* describes the surface of oceans is prone to heat; melting of ice causes risk of rise of ocean level. As compared to the reports of 1995, the present condition is not good and preventive measures need to be taken in this regard. On 21 September, a news published on Page 9 in *Times of India*, describes about waste water treatment plant with a capacity of 318 million litre. It would be Asia’s biggest and cheapest sewage treatment plant. The news reflects a positive development in the field of water and environment. There is some occasional news which is related with small tree plantation programme organized by a social group. A news given on 2nd page of *Dainik Jagran* focuses on Adarsh Gram Yojna. It is very difficult to know through newspapers about the beginning and progress of any urban development programme. There is not any such discussion in the newspaper. The editorial page has not given any article about the urban development programme. Similarly, there is no feedback of readers about these programmes.

### Findings and conclusions

The newspapers cover various important news in all areas of human life to a great extent. However, maximum number of stories are on crime, accidents, politics, agitation, film, glamour, etc. News about sports and business being given on separate pag-

es. The problems related to road, electricity, health, were widely covered. The news of strikes, processions are extensively covered, but development programme hardly find any space in mainstream media. The coverage of development programme is very abysmal or negligible. Even if given, the news on development programmes are not that informative as compared to other subjects. There seems no coordination among development agencies and media for successful implementation of the programme.

The editorial page of the newspapers occasionally give articles about development programmes. The Letters to the Editor columns of newspapers do not carry any feedback on development news, but mainly individual issues. The development issues are given coverage whenever there is any specific day or any official inauguration of such programme. The readers of newspapers also do not give their feedback in reference to development programmes. There is no provision in the newspapers to have a specialized reporter who keeps track of various development activities, collects data, and does reporting. Unfortunately, the development activity is not considered a news unless there something goes wrong! DD News, for instance has started given developmental news under the title “Good News”.

The interview of officer related with development programme is not given. In this way, the awareness of mass media in reference to development programmes is far from satisfactory stage. Surprisingly, majority of newspapers do not consider news value of these development programmes which are going on in various areas, and country’s future progress is based on them! Similarly, mass media is also not playing participatory role in development programmes of the nation. The dissemination of information about development programme is even today considered as part of government advertisement. It has resulted in poor knowledge of development programme in mass and large number of people remain unaware about such programme, while others take advantage of people’s ignorance. Interestingly, various development agencies also try to hide their developmental programmes, for unknown reasons.

In *Gaon Connection*, no news was published in August on development. The month of September was a bit better in terms of development as ten news in total were published on various development issues such as agriculture, science and technology



and mobile technology. This clearly reflects that the purpose of *Gaon connection* is not fulfilled, as it is expected to publish development news more often than that of the print media does.

*Hindustan Times* an English daily also published only four news in August, on 12 and 19 August, it published two news each day. The month of September had only two development news published on 6 and 7. *Dainik Jaagran* published only three development news on 19 and 24 August. *Dainik Bhaskar* shown a low score in terms of coverage of development news with only two news, one on 12 August, and other on 10 September. The following table shows different categories of development news and their coverage in different newspapers.

## Recommendations

Print media and newspapers should be made an integral part in the process of development. The development stories about various programme should be increased in newspapers for more publicity and awareness. The feedback of common people about the implementation success and failure of development programme should be continuously given. The newspapers may take any particular programme for case study in reference to its success and failures. There must be some guidelines for news related to development programmes. The public opinion about development programme should be given as part of the story. Newspaper must invite opinion of com-

No.	Development news area	Name of newspaper	Date
1.	Health	<i>Hindustan Times</i> <i>Gaon Connection</i> <i>Dainik Jaagran</i>	19 August, 6 September 11 September, 15 September 26 August
2.	Science and technology	<i>Times of India</i> <i>Gaon Connection</i> <i>Dainik Jagran</i>	9 September, 16 September 27 August, 8 September 26 August
3.	Water management	<i>Gaon Connection</i>	18 August
4.	Agriculture	<i>Times of India</i> <i>Gaon Connection</i>	20 August 6 September, 15 September 18 September
5.	Education	<i>Hindustan Times</i> <i>Times of India</i>	12 August 3 August
6.	Sports	<i>Hindustan Times</i>	19 August
7.	Government initiatives	<i>Dainik Bhaskar</i>	12 August
8.	Rural development	<i>Dainik Jagran</i> <i>Gaon Connection</i>	4 September 28 August
9.	Dairy development	<i>Gaon Connection</i>	20 September
10.	Environment	<i>Hindustan Times</i> <i>Gaon Connection</i>	12 August 6 September
11.	Social and economic development	<i>Hindustan Times</i> <i>Gaon Connection</i> <i>Times of India</i>	7 September 28 September 25 August 21 September
12.	Solar	<i>Gaon Connection</i>	17 September
13.	Women empowerment	<i>Gaon Connection</i> <i>Dainik Bhaskar</i> <i>Dainik Jagran</i>	16 September, 28 September 10 September 4 September

mon people about development programme. Participation of all people associated with the process of development should be encouraged.

The possible factors in the genre trends may be considered for inclusion. The development stories appear to get little attention from editorial desks as these are not considered an issue of importance. On the other hand, the attention given to sports and other features indicate that these genres provide more potential for deeper coverage of development stories. Such studies can be carried out focusing on a particular area of development. A comparative study can be done between the coverage of development news

among different media.

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# Food science as part of TV cookery shows: A study

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*Five popular Television Cookery Shows – Samayal Samayal (Vijay TV), Aarokiya Unavu (Jaya TV), Konjam Soru Konjam Varalaru (Pudhuyugam), Anjarai Petti (Zee Tamizh) and Celebrity Kitchen (Pudhuyugam) were considered for the study to explore the extent to which food science is part of Tamil television cookery shows. The study divided the “Food Science” content into various parameters and analyzed the contribution by the shows to food science by using content analysis as one of its methodologies. Expert opinions were also taken to conclude the details on the importance of food science in every day food habits, to know whether food science is considered before suggesting a tip in cookery shows and to find whether not following food science might lead to any side effects.*

*The study found that food science has a greater importance to an individual’s life as its inclusion can help people take better food choices. While television cookery shows followed to certain extent the information on food science, producer of cookery shows are not aware that they are giving out details on food science. The study also found that there might not be any serious side effects while not following food science during cooking and food selection, it is still the advice of food scientists that incorporating food science in one’s life will open a new door of healthy living among them.*

**Keywords:** Food science, Food consumption behavior, Cookery shows, Media influence on eating habit, Food pyramid, Nutraceutical behavior, Food adulteration

## Introduction

Food is the primary necessity for the existence of a

human being and its importance is marked first in the order- food, shelter and clothing. Hence, food and its various methods of preparation have since

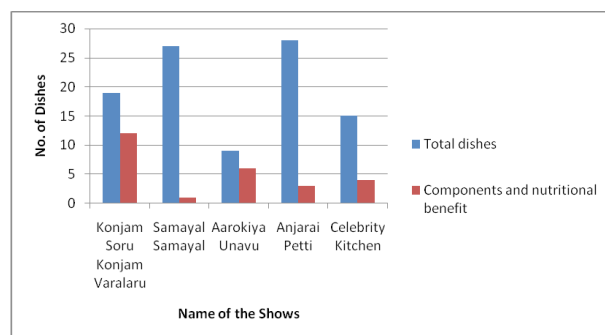
then evolved with people, time, techniques and technology. Further, a new science to study the processing of food was developed and was named 'Food Science'. Food Science is defined as "the discipline in which the engineering, biological and physical sciences are used to study the nature of foods, causes of deterioration, the principles underlying food processing and the improvement of foods for the consuming public"<sup>1</sup>. Food science plays a major role in improving and identifying the nutritive content in a product and also, helping these nutritive contents fit to human needs <sup>2</sup>. In India, there are around 10 Acts passed by the government through the Food Safety and Standards Authority of India (FSSAI) to check various aspects of food processing. Media on the other hand, has been educating and entertaining people by disseminating information on the evolving food products and the techniques of processing them. Media was also deemed to be the main source of information about food and nutrition to people <sup>3</sup>. Of the media that were used to share information on food, it was found that people chose television to gather more nutritional information <sup>4,5</sup>. The media exposure or the exposure to television depending on the age of viewers was analyzed and it was found that children of age 2 to 4 years are exposed to television 4 hours a day, middle school children are exposed for 8 hours a day and adults, 15 to 17 hours in a week <sup>12</sup>. The details thus, state how far media can influence people with the content. Although, children tend to eat more food in terms of quantity while watching television, the ones who eat are mostly unhealthy foods<sup>6</sup>. Also, 30% of non-programme content being telecast on television involves advertisements for food<sup>13</sup>. While media faces criticism from various corners for apparently propagating unhealthy food <sup>6,7</sup>, it is still believed that food programmes through media can serve as the best platform to discuss healthy eating<sup>8</sup>, primarily by following the "Food Knowledge Programme" concept, which will focus more on the science of the food <sup>9</sup>. Eventhough, cookery shows these days are seen as an entertainment source, they are also partially educational and hence, became the perfect vehicle for the dissemination of food safety information to people <sup>10</sup>.

Five popular cookery shows namely *Samayal* on Vijay TV (will be mentioned as SS), *Anjarai Petti* on Zee Tamizh TV (mentioned as AP),

*Celebrity Kitchen* in Pudhuyugam TV (mentioned as CK), *Aarokiya Unavu* on Jaya TV (mentioned as AU), and *Konjam Soru Konjam Varalaru* on Pudhuyugam TV (mentioned as KSKV) were looked upon, to understand the extent to which food science is a part of television cookery shows in India.

### Components and nutritional benefits

It can be seen that the two popular cookery shows, *SS* and *AP*, that have the highest number of dishes prepared, have mentioned very less about nutritional content and components (Figure 1) present in the ingredients used, while cooking. *KSKV* cookery show tops the list in mentioning the nutritional content and components present in the ingredients; though not for all, but for specific ingredients that is used in the cooking process. Mentioning Vitamin C, Phosphorous and Magnesium present in Toor Dal, in one of its episodes, and the nutritional benefits of Vitamin A, C and Magnesium on consuming beetroot, in another episode, made the show stand out from the other cookery shows.

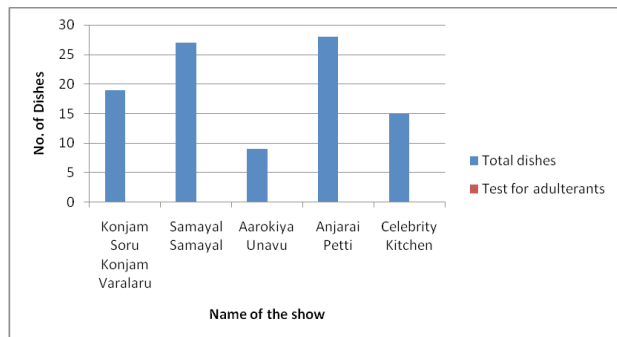


**Figure 1. Mention of nutritional contents and components in shows**

### Test for adulterants in cookery shows

Adulterants are the rodents that can cause unimaginable diseases and irreparable damage to the human body. Figure 2 clearly indicates that none of the shows concentrates on testing for adulteration in their ingredients. Adulterants are not the only artificial components added to food items but also the pesticides and insecticides that are used during the crop growth. There are also many databases pertaining to the number of adulterants. Thus, a clear idea of eradicating the possible adulterants present

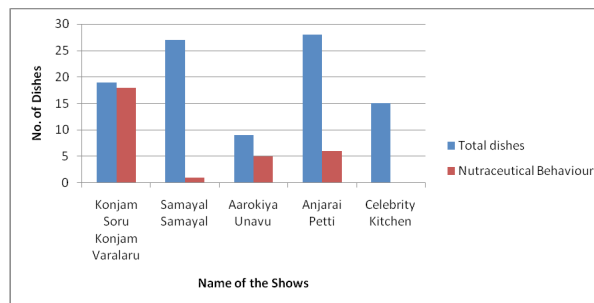
in the food is not easy. However, the basic known effects of insecticides and pesticides, which are also adulterants, can be avoided by demonstrating and asking people, through cookery shows, to wash their food products before cooking or during consumption. Ironically, none of the shows stressed for it in any of the programme is indeed alarming.



**Figure 2: Mention for the test of adulterants in cookery shows**

### Nutraceutical behavior of food component

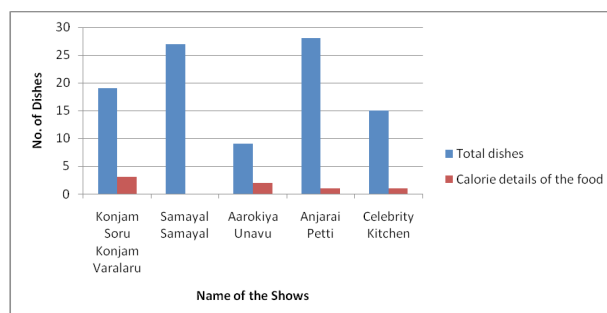
From Figure 3, it can be seen that one out of five shows concentrates more on the nutraceutical behavior of the ingredients used. Nutraceutical is a term coined by blending the words “nutrition” and “pharmaceutical”, by Stephen De Felice and is defined as “a food or part of food that provides medical or health benefits, including the prevention and/or treatment of a disease”<sup>11</sup>. *KSKV* focused more on the importance of an ingredient and mentioned in its episodes that the nutraceutical behavior of sweet potato can help people keep their pressure level intact while beetroot mixed with honey can serve as a good medicine for burns. While not all ingredients tend to have a nutraceutical behavior of their own, there are ways in which nutraceutical components can be extracted from certain items and can be added to food. Certain ingredients are used for taste purpose and certain others are used for the purpose of aroma. Therefore, the nutraceutical behavior depends mainly on the ingredients that are used to prepare the food item. Among these cookery shows, *Konjam Soru and Konjam Varalaru* focused more on medicinal value of the cooking than the aesthetics as compared to others.



**Figure 3: Mention of nutraceutical behavior of components in cookery shows**

### Calories or ingredients of a food

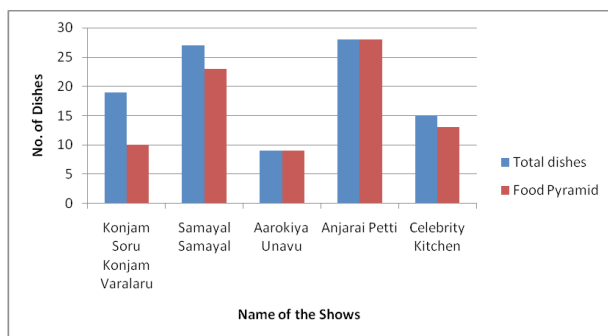
The energy gained by a living being through food is calculated in the unit - Calories (cal/kcal). The energy is provided to the body through the food that human beings consume. Thus, food is the primary contributor of sufficient amount of calories for the body. While each ingredient contributes separately to the calorie content for the body, the food’s calorie content as a whole provides an accurate detail on the energy being provided to the body. While all the above-mentioned shows have mentioned calorie details of the food in at least one or two of its episodes, none of them mentioned calorie contribution of the food as a whole. From Figure 4, *AU* and *SS*, which mentioned calorie content more than the other shows, specified the details only while using special food ingredients like Kodo Millet and Little Millet. The other shows did not mention many details or they did only for special cases. Thus, the calorie content of a food was not properly dissipated through the shows.



**Figure 4. Mention of calorie content in a food or ingredient**

## Food pyramid guidelines followed by the Shows

Food pyramid is another important aspect of food science. Food pyramid is the correct level, amount and type of food that should be consumed by an individual in their everyday diet. Hence, Food pyramid is the correct contribution of food items for a healthy living. The importance of Food pyramid is that it teaches people the level of food that they should take on a daily basis. If even one level becomes unbalanced, it so happens that the energy levels end up being unequally distributed. While Food pyramid does not depend only on meals or a particular dish, it also varies with the ingredients used to prepare a food. For example, a whole meal can follow the food pyramid while a single dish, like a vegetable salad can also amount to the same food pyramid provided the ingredients are appropriately distributed. From Figure 5, it can be seen that almost all episodes of the cookery shows have made sure that the dishes being cooked in them included every food item that contributed to the food pyramid guideline. Only two of the four shows were noted to have not followed the food pyramid, with just an episode or two missing the same.

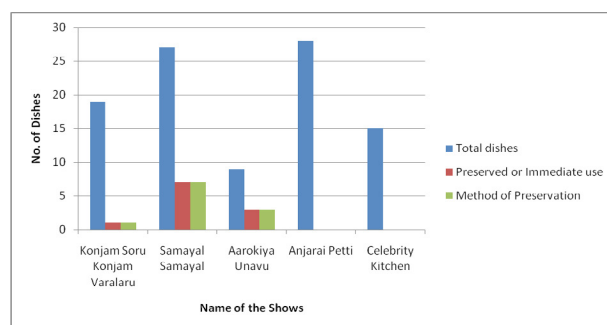


**Figure 5. Episodes/ dishes that follow food pyramid**

## Preservation quality of food and preservation method highlighted

A special quality of food is that it can be preserved and can be consumed later too. Though not all food items have the quality to be preserved, the ones that possess the character need to be preserved in a particular method. There are three common methods of preservation – freezing, high temperature and

canning. While food for immediate consumption can be identified through observation, the chefs or the food makers did not make it a point to mention details of the same (Figure 6). However, with food items that can be preserved, the food makers of the show made it a point to mention the method of preservation. Most of the food items prepared were canned or refrigerated for preservation.



**Figure 6. Preserving quality and preserving method of food**

While food science can be considered as a combination of the above-mentioned minimal details put together, informing people on these details can significantly bring a change in their attitude towards food selection. The incorporation of food science in everyday life can help people understand what proper diet is and can help people lead a healthy life. Food science is the key to help people know what they should eat and the quantity they should consume. With various diseases emerging due to bad food selection and food habits, it is high time that people are informed on such details to help them keep diseases free. As mentioned earlier, people rely more on media to gather information about food and nutrition. Thus, concentration of media on the in-depth details of food science can help people look at food differently even beyond the taste that it provides, but as a medicine too that promises a healthy life!

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# Science awareness helps reduce snakebite mortality at Jaunpur: A study

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*Out of 3,000 species of snakes found globally, only 410 species are poisonous around the world. Most of the people believe that all snakes are poisonous, which is a mis-belief. Snakebite is an occupational hazard causing considerable morbidity and mortality worldwide, particularly in tropical countries like India. About 270 snake's varieties in India are reported, while only a few of them are poisonous. Snakebite has been a recurring problem in the society, especially in rural areas, undoubtedly many snakebites case severe consequences even leading to death. Snakebite is a significant health concern, especially in rural populations of tropical and subtropical countries. Certain beliefs among the members of a society sometimes arise out of fear, helplessness, mis-beliefs or misunderstanding. These are generally referred to as "superstitions." These beliefs have existed since the earliest days of mankind. Many of them have no scientific temper; although they often appear illogical or unreasonable, they are still an integral part of peoples' hearts, brains and minds. In the present study, focused on Baksha Block, District Jaunpur, Uttar Pradesh from 2012 to 2017 on snakebite cases, it was found that most of the peoples were not having a scientific temper, rather they displayed strong mis-belief in superstitions. However, death rate was decreased during 2012-2017 and significant death reduction was observed where the victim had availed medical treatment within 2 to 6 hours. Maximum deaths are observed when people do not avail any scientific method. The results were drawn from questioners administered amongst people (sample size > 30) belonging to different locations. Though, most of them believe in various superstitions, such as going for exorcism, quacks, etc., many of them were able to save lives by taking medical aid due to appropriate education and awareness.*

**Keywords:** Snakebite, Snakebite death, rural people, superstitions, appropriate education.

## Introduction

Usually, the reports of snakebites coming especially

from rural areas are alarming. Basically, throughout Asia-Pacific Region snakebite's treatment remained in the domain of traditional, herbal or Ayurvedic



practitioners for the ages, therefore, majority of snakebite cases were not recorded. The global situation is based mainly on hospital records or health authority statistics, and publications. As an estimate, total number of snakebites each year might exceed five million with a mortality of 125000 each year in the world as a whole, including four million snakebites, two million snakebite envenoming, and 100000 snakebite deaths each year in Asia (Chippaux 1998). Most snakebites happen when the snake is trodden on, either in the dark or in undergrowth, by someone who is barefooted or wearing only sandals. The snake may be picked up, unintentionally in a handful of foliage or intentionally by someone who is trying to show off. Some bites occur when the snake, usually krait, comes into the homes at night in search of its prey and someone sleeping on the floor rolls over onto the snake in their sleep. Snakebites can happen in rural areas as well as in cities, but turns to be lethal largely in rural areas due to non availability of anti-venom injections or prevalent superstitions. Odisha and Jammu, where people sleep in small huts or open space witness frequent bites by krait during the night and wake with paralysis (Saini et al., 1986). A single bite of cobra contains venom capable of killing 15 to 20 persons. When 13 mg of venom is fatal for an average weight man, it can inject 12 to 20 times such dose and that is why serious cobra bite cases may not reach hospital within one hour. Time is a great factor for the cure of snakebite. The largest venom dose of any snake can be neutralized by anti-venom injection. Simply to illustrate, it can be said that injection of a mix of this venom and equivalent anti-venom has no effect on experimental animals. Then, where is the difficulty in curing a cobra bite? Simply people spoil time in reaching the hospital. They spend minutes in realizing the risk and ignore the gravity of snakebite, search a local traditional healer. Even today, in many places people carry the victim to the place of worship to pour water on the head, etc. All methods of first aid have been proved to be ineffective in snakebite, except immobilization of the victim. Least movement of the bitten part or the body could be a precaution one can take, so that venom may confine to local site of bite for longer duration, rather than movements of the patient, i.e. walking or running that increase blood circulation and eventually hasten venom entry to blood and brain.

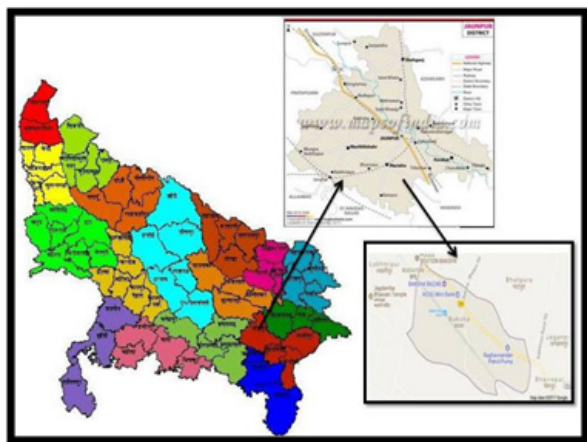
Another precaution is the control of anxiety, as the excitement will increase heart beat further spreading venom. Make the victim lie flat with bitten limb below the heart level. Remove shoes, rings, watches, jewelry and tight cloths from the bitten area as they can act as tourniquet when swelling occurs. Do not apply a tourniquet (Amaral et al., 1998), do not wash the bitten site with soap or any other solution to remove the venom, do not make cuts or incisions on or near the bitten area (Bush et al., 2000), do not use electrical shock (Devis et al., 1992), do not freeze or apply extreme cold to the area of bite, do not apply any kind of potentially harmful herbal or folk remedy, do not attempt to suck out venom with your mouth (Anker et al., 1982), do not give the victim drink, alcohol or other drugs, do not attempt to capture, handle or kill the snake, patients should not be taken to quacks. Some initial research suggests that a "Pressure Pad" at the site of bite may be of benefit (Tun-pe et al., 1995). This, however, needs to be evaluated at field level in India to assess its efficacy. Snakebite Protocol of India, 2007 deals with the subject in detail. Snakebite has created a kind of phobia all over the world and WHO has issued guidelines in snakebite with display of venomous snakes of medical importance for different regions. Nations with high snakebite fatality like India, Pakistan have formulated national protocols of snakebite for affected areas. Indian national protocol has formulated the method of treating different types of bites and has outlined treatment, with all precautions. Few cobra bites may be too poisoned to take advantage of 40 minutes, but majority can be saved if the victim gets anti-venom injection in a given time-frame. The provisions of National Snakebite Protocol are not conclusive on treatment of such cases. Evidences of snakebite attendance in medical centers at present indicate improvement. The cases of snakebite mortality as revealed from data available today are definitely reduced to some extent as compared to the data available ten years before. The faster urbanization and deforestation is a way definitely to reduce snakebite substantially, yet total reduction cannot be thought of in such a tropical region. Incidences of cobras in rural as well as urban areas of Jaunpur were observed frequently. Severely envenomed cases are a few among such bites, very short time in hands due to very quick spread of venom in human system and affecting nerve mechanism

of respiration and rapid onset of death debar cases in receiving treatment. The objectives of the present study are: i) to observe the mindset for snakebite among the male and female in Baksha block; ii) rate of snakebites and death, and iii) impact of awareness of snakebite protocol among people.

## Materials and methods

### Study sites of SB and awareness towards medical treatment

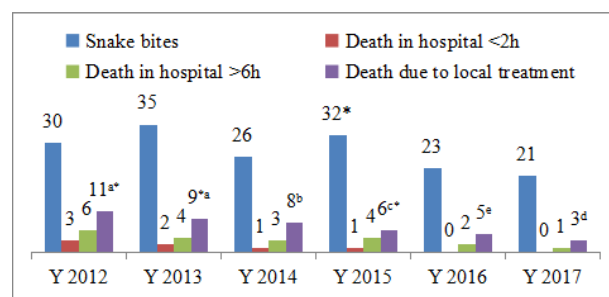
Study sites of the present study were spread over different locations of Baksha Block, Jaunpur District, U.P. A descriptive cross-sectional study based on self-administered questionnaire among SB victims in Jaunpur on the provisions of Snakebite Protocol 2007 led to some significant observations with respect to superstitions and treatment of SBD, during the year of 2012 to 2017. A random descriptive cross-sectional study was carried out each year over the period. The study is based on about 12 doctors and 42 health professionals employed at the hospitals along with rural peoples (>30) from each site of Baksha Block. Analyses of variance were performed with the SAS (Statistical Analysis System) software (Version 9.1). Dun-can's test was used for multiple range analyses to determine the significant difference between groups of data. The results were considered to be significant at  $P < 0.05$ .



**Figure 1: Survey and study sites of Baksha Block, Jaunpur, U.P.**

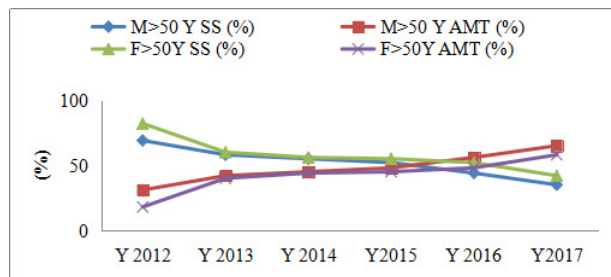
## Results and discussion

A significant observation involving superstitions remained dominant throughout the study in the cases of snakebite and snakebite deaths among old persons (>50 years; Figure 3) followed by young persons (<50 years; Figure 3) in Baksha Block, Jaunpur District (Figure 1). About 67% snakebite deaths were observed in the year 2012, while out of 30 snakebite cases, 11 died due to local treatment due to prevailing superstitions (Figure 2). WHO reported that about more than 25,00,000 venomous snakebites per year result in 1,25,000 deaths worldwide, out of which about 1,00,000 are in Asia and approximately 20,000 in Africa (Pinho et al., 2005 and Sitprija, 2006). Around 3000 species of snakes exist globally and about 410 are considered venomous amongst them (Pinho et al., 2001).

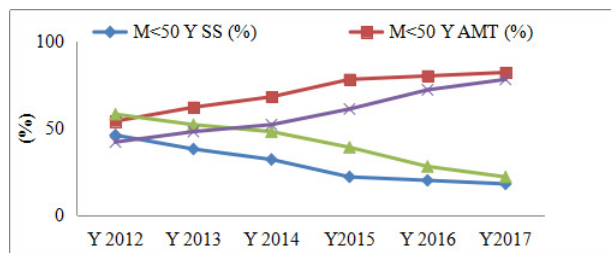


**Figure 2: Snakebite and snakebite deaths in Baksha Block, Jaunpur**

This is due to tropical climate, agricultural and forest based livelihood and many other social factors associated. The American Society of Tropical Medicine and Hygiene still quotes very high figures from India, i.e. 46,000 persons die every year from snakebites, against the official figure of only 2,000 (*Times of India*, 6 December, 2011). Jena et al., 1993 earlier reported 2,500 to 6,000 cases of snakebites in Odisha causing around 1,000 snakebite deaths annually in Odisha. In the present study, snakebite death records from hospitals were surprising, self-administered questioners based survey among doctors, health personnel, and others has revealed that people from rural areas were generally less aware of medical treatment of snakebite, although a few of them were able to reach hospitals in serious to very serious conditions. Earlier, they used to avail quake treatment or treatments related superstition. In such cases the patients were generally not curable and most of them died (Figure 2).



(A)



(B)

The present study was focused on scientific communication and awareness towards snakebite menace and to reduce snakebite cases in Baksha Block (Figure 1). It was found that out of 13 different locations, 1062 peoples of Baksha Block were almost unaware of the proper medical treatments of snakebite. It was observed that males and females who

are above 50 years, strongly believe in superstitions rather than medical treatment, followed by those below 50 years. All of them belong to rural area and low literate. Undoubtedly, this is an alarming situation for society. Keeping in view the scenario, the author had initiated an awareness campaign for Snakebite Protocol 2007 in the area of study by involving science communication students. First, we gathered the snake-catchers from the locality and made a team to interact the native people beginning from 2013. As compared to a well established fact supported by several research papers that all snakes are not poisonous, most of the people from Baksha Block believed that all snakes are poisonous. The team has been able to demystify the miss-perception and improved the common understanding of the people about poisonous and non poisonous snakes by way of identification of native snakes (Figure 4). Accordingly, the phobia of snakebites and snakebite deaths reduced during 2012 to 2017 (Figure 2).

The team worked on three dimensions, viz. Wiping-out superstitions associated to snakebite; identification of poisonous and non-poisonous snakes; and promoting awareness for proper medical treatment of snakebites within given time-frame. The study also stresses over the fact that science



***On-site snakes awareness activities at Baksha Block involving science communication students***

communication as a tool has been extremely effective towards achieving the intended objectives with encouraging impact (Figure 2).

### Conclusion

Science communication plays an important role in the society for improvement of healthy life among rural masses of the country. However, the diversity of people in our country with respect to local languages and habitat poses certain challenges while conveying the knowledge and messages of science to them. Development of scientific temper in rural areas is yet another aspect needs to be given due priority. The present study shows the limited awareness towards snakebite cases, prevalence of age old superstitions, and improper accessibility of medical treatment, etc. During the course of the study, the people were educated and motivated for proper medical treatment, resulting into reduction of superstitions as well as snakebite mortality in the area.

### Acknowledgement

The author is grateful for all encouragement and support provided by Prof. Raja Ram Yadav, Vice Chancellor, VBS Purvanchal University, Jaunpur for the study. Thanks are also due for Popular Science Writer Dr. Arvind Mishra, Dr. Sudhir K. Upadhyay, Dr. V.S. Upadhyay, M.D., and Mr. Murari, Snake-catcher, for their valuable guidance and help.

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# Understanding science communication in current context

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## Introduction

As the human society is getting more and more dependent on S&T, it is high time the citizens to be educated on various aspects of scientific temperament and scientific literacy. We need to realize the growing importance and need of making the common man conversant with various aspects of scientific developments so that the society can lead a better life in the near and distant future. At a time when there is no dearth of information necessary for leading a better life probably in all aspects of the society, the question arises is how to utilize mass media in a judicious way to ensure that the people are benefited from such information in a convenient and comprehensive manner! We must explore the role that media can play in this direction. The synergy between media and researchers is necessary for achieving the ultimate goal of letting people enjoy the advantages of scientific discoveries at individual, family and also at the societal level. The challenges being confronted while going ahead with implementation of the efforts in this direction need to be addressed.

A famous science fiction writer Carl Sagan said “it is suicidal to create a society dependent upon science and technology in which hardly anybody knows about science and technology”. In today’s world, we can’t afford to have people who are science-illiterate. They require a minimum level of scientific knowledge even for their (and others’) routine life. Hence S&T communication should be taken in a wider sense here<sup>1</sup>.

In simple everyday language the term science communication means ‘communicating various aspects of scientific developments for the benefit of

the common people in a language they would be able to understand.’

In other words, making people aware of the different inventions, discoveries, innovations in science and technology so that they can understand these developments in a simpler way. It also entails inculcation of a scientific temperament among masses so that they are rational not superstitious. Generally, science and technology are perceived as the domains of laboratories, research and development centers, universities, technological institutions, etc., but it should be taken to the masses in public friendly manner<sup>2</sup>.

Science communication, being a complex network of social channels, serves as a mechanism for bridging the gap between the scientific community and the lay public. It is also an effective tool for extending scientific boundaries and gaining wide public support for important research and development, which are indispensable for society’s development.<sup>3</sup>

In this regard the UK’s National Association of Science Writers (NASW)<sup>4</sup> says that no one can doubt the immense impact of science and technology on society today as we are faced with the challenges of not only understanding the current multiple revolutions in this field, but also how they affect the future of humanity and of the earth.

## Why science communication

The important question is why do we need to communicate various developments in science and technology to various stakeholders! For example, in our country there are several agriculture universities including veterinary faculty, a network of high-profile

laboratories engaged in different types of research in various disciplines. This large pool of knowledge needs to be disseminated to different target groups.

Again, from personal decisions about health care, which car to buy or whether it's fine to eat the chicken that has been out of the fridge all day, to bigger, societal decisions about military technology, online privacy or stem cell research, helping people to understand science involved is crucial. Science communication has an important role to play in helping people to learn about science, to understand science issues when they hit the news and to have a voice in debates.<sup>5</sup>

Usually, it seems that most researchers may not be very good communicators. Besides, though the categories of target audience for such efforts may be several, yet the communicator has to prepare the communicate in a language that is conveniently understandable to them rather than the highly scientific language of research. The communicator must be able to rephrase the developments in simple and easily understandable language for the common persons. This shall ensure that the benefits do trickle down to the maximum possible number of people in the long run.

### **Role of media**

The medium used for the purpose is also important as all the classes of the target audiences may not be subscribing to the same set of media without variation. Thus, media planning or selection of the right kind of media for reaching out to the maximum possible number of people is also equally important enough to achieve success in this field.

Media's role in science communication has always been important for all concerned. The most important single information source for the public about science and technology is the media. Thus, helping science journalists to produce factual, intelligible, timely information is critically important to society. Now, as a science communicator the responsibility of the person would be two-fold.

One has to explain what this concept in reality means and what are the future potential usage of such a concept and related developments.

Science reporting is an important specialization in media with many newspapers, magazines, television, radio having dedicated columns, pages,

programmes for this domain on a regular basis. *The Hindu* has a weekly full-page coverage on scientific developments with different fields. At the same time many other organizations sponsor special programmes on television and radio.

The programmes, special pages with information, suggestions, consultation facilities on agriculture, medical health issues in the media are also included in science communication.

In this context, a few additional aspects also need to be observed. Many a times, a scientist or a researcher in any field of science comes out with a claim that a new invention has been arrived at and approaches the media for dissemination. At this point the communicators must ascertain whether the claim is valid or not and needs to confirm the authenticity of the claims. Otherwise, how can a science communicator be a judge of the veracity of such a claim! This verification process is more important so that false information does not percolate.

### **Promoting scientific temper**

Another major responsibility of science reporting or communication is to inculcate a sense of scientific temperament among people. It is the responsibility of the media to inform people about various pros and cons of any situation so that people become enlightened and aware about the reality.

Attention given to science in most news media is small in comparison to that accorded to business, politics, or even sports and entertainment. In an era of unprecedented technological and scientific advances, many of them have the potential to radically improvise human existence, science news is highly important. Communicating science and scientific enterprise is an important responsibility of science communication. Although, science news items do not get covered in the mainstream press and may not reach science-interested audiences<sup>7</sup>.

### **Science communication in India**

Noted science communicator from India, MK Patiriyaya, says "various classical scientific texts were created in ancient India, which still form a huge treasure of our scientific and cultural heritage. However, a remarkable gap between scientific knowledge and the common man remained during the entire span

of time". National Institute of Science Communication and Information Resources (NISCAIR) was established in 1951 in the form of Publications & Information Directorate (PID), which eventually became NISCAIR. With a view to integrate, coordinate, catalyze and support the efforts of science communication and science popularization, at micro as well as macro levels in the country, the Government of India established the National Council for Science and Technology Communication (NCSTC) in 1982 as an apex body. Its prime objectives are – to popularize science amongst all the sections of the society, to inculcate scientific and technological temper amongst masses and to promote, catalyze, support and orchestrate such efforts in the country (Patairiya 2001).

Several important initiatives have been launched to promote and communicate science by bridging the gap between science and common masses through diffusion of information.

The primary concern is to help science and scientific cultures penetrate India's diverse society, and to transform it into a nation of scientifically-thinking and scientifically-aware people.<sup>8</sup>

Science writing or science journalism remains underdeveloped in India though it had a good beginning in the early 1950s, and there are many dimensions to the problems of science communication. It has not progressed to a desired stage yet. The larger segments of the population do not even have access to scientific knowledge due to illiteracy. Also because of absence of seriously-planned agenda for disseminating scientific knowledge to non-scientific community whose curiosity has increased on science and technology over time<sup>9</sup>.

### Challenges of science communication

How to approach science communication for a better and improved understanding of the issues important to the target audiences! Here a few critical questions have to be answered. Most important in the process is a breed of communicators who may be termed as 'professional communicators'. They must be apt in performing as a bridge between the researchers,

research institutions or repositories of knowledge from where the knowledge or information have to be taken to the masses and in a language the common people are comfortable with. As a matter of fact majority of researchers, whether in pure sciences, social sciences, or humanities are not good in expressing or presenting in a lucid language. So, science communication is a far-more challenging job than general communication. Further, consideration of background of the target audience is also highly significant here.

It depends upon whether it is for children, adults, professionals with a pure science and technology background, or amateurs interested in learning about scientific phenomena. For each of these categories of target audiences, the presentation style has to be different to suit differing requirements.

### Conclusion

It becomes obvious that science communication needs to be promoted and developed as any other aspects of communication in the society. This is necessary for serving the ultimate goal of informing the masses about a scientific way of doing things and maintaining a certain standard of life. For doing this with optimum success, support from media is a prerequisite.

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# Information technology: Revolutionizing communication

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One of the most important contributions in man's progress has been perfecting the information communication systems by which a constant interchange of knowledge is achieved. The early men were able to communicate only through the use of body language and signs. Then came the development of language and writing, by means of which men could express an infinite variety of concepts and also transfer them from one generation to the next. The centuries that followed, saw the rise of other forms of information communications, like printing, typewriting, photography, telegraph, telephone, sound recording devices, radio, television, radar, facsimile transmission, micro filming, pager, internet, mobile communication 2G, 3G, 4G, and 5G providing connectivity the world over along with high speed internet facility on mobile phones for surfing net, chatting, viewing television, etc. Information technology as a discipline, has developed very rapidly in theory and in practice since last three decades, but its roots are as old as human civilization. Man's greatest scientific discovery, the use of fire dates back to pre-historic time. Importance of writing in the development of every other branch of knowledge can never be ruled out. A good information communication between science and society

leads to the development of scientific culture which can be utilized to broadly solve global, regional, physical and social problems to a large extent. Documentation of knowledge for posterity was the next step, which was a paradigm shift from the prevalent transfer of knowledge.

Science is concerned with the quest to learn about the nature and processes to utilize natural resources for benefit of mankind (technology) and the never ending race for modifying and optimizing the technologies to the fullest extent as far as possible. The importance of documenting information<sup>2</sup> for posterity can be taken as the advent of information technology era.

Information technology as a discipline has grown and developed very rapidly in theory and practice since last three decades. Its necessity stems from the fact that communication between science and society leads to the development of scientific culture which can be utilized to solve global, regional, physical and social problems leading to progress and overall well being of the global society.

Control of electrons, the invisible negatively charged particles led to the development of electronics which revolutionized our living in every corner of the world. The journey started with the



electronic tubes followed by transistors, computers, LSI, VLSI, lasers, masers, ultrasonics, etc. The incredible growth of electronics has come from miniaturization of transistors and improvement in manufacturing. This synergy has revolutionized not only electronics but also society at large.

The twenty-first century is going to be the era of information technology due to rapid advancements in the Third Generation - Systems of Nano-systems (2010-2015). In this stage assemblies of nano-tools work together to achieve desired products. At this stage significant advancements in robotics, biotechnology, and new generation information technology will begin to appear in products. Fourth Generation - Molecular Nano-systems (2015-2020). This stage involves the intelligent design of molecular and atomic devices, leading to unprecedented understanding and control over the basic building blocks of all natural and man-made things. At this stage a single product will integrate a wide variety of capacities including independent power generation, information processing, communication, and mechanical operation.

Fifth Generation - The Singularity (2020 and beyond). Every exponential curve eventually reaches a point where the growth rate becomes almost infinite. This point is often called the Singularity. If technology continues to advance at exponential rates, what happens after 2020? Technology is likely to continue, but at this stage some observers forecast a period at which scientific advances aggressively assume their own momentum and accelerate at unprecedented levels, enabling products that today seem like science fiction.

We should not forget how differently people lived before they learnt to harness the power and set the forces of nature to work. Quest for knowledge and its sharing shall continue to remain fundamental human right for any individual. However, due con-

sideration is to be given to morals and ethics when new scientific discovery is applied to technology. The new wave information technology embodied with artificial intelligence and cyber-physical systems is going to revolutionize the way we communicate, learn, interact, and understand impacting our lives and behaviours in an unimaginable manner, for which we need to be cautious and optimistic!

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# Stories of elephant-human conflict in media: Content analysis of two Indian dailies

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Several trends indicate public attitudes toward elephants and other charismatic wildlife have changed during the 20th century. However, empirical studies of published stories in Indian press indicate the negative and sensational nature of stories. The author has analyzed stories in *The Hindu* and *The Times of India* over 6 years (2006 - 2011) and classified each expression by type and valence, i.e., positive, negative. The results show an increase in the percentage of discourse about elephants that is negative in one newspaper as against the other. The newspaper situated in the region of conflict expressed more negative viewpoint as compared to the other, which used wire-agency stories written by reporters away from the zone of conflict. Additionally, discourse varied by exposure to elephants with new human habitation spreading into Elephant habitat had significantly more negative expressions per article. Results suggest that even the anticipated presence of elephant populations alters social discourse about the endangered mammal, which could impact attitudes towards elephants over the period.

Print media is one form of public discourse that provides a means to examine human-elephant interactions. A content analysis of articles was carried out addressing elephant events reported in *The Hindu* and *The Times of India*, two Indian print media between 2006 and 2011. The Asian Elephant (*Elephas maximus*) is arguably the most charismatic and controversial wildlife species in India. To some they are a symbol of the wild and an iconic species with cultural and religious connections who require public support for the restoration of endangered species, while to others they are “a menace” and “run amok” destroying and killing humans and their crops. The study on the reportage on elephants underscores

this dichotomy. Once hunted and killed with great passion by Maharajas and British big game hunters, elephants now stand on the precipice of recovery largely because of human efforts to protect and restore the species. Today elephants are killed for several reasons, i.e., protecting crops, humans, and for economic advantages, etc., but also out of fear and loathing for a species that had been demonized by the press for decades.

Basing the analysis in grounded theory, important descriptive and emotional themes surrounding these events were identified. The most common words describing elephants were: menace, run amok, panic, trampled and rampage. Interactions were described as attacks and wild elephants were portrayed as not natural in cities, as an invasive species, and more recently using language depicting criminal behaviour by coming into cities. Descriptions of elephants killing or attacking people were inflammatory, i.e., trampled, rampage, whereas descriptions of people killing elephants were not shown as unfortunate circumstances.

Five emotional responses emerged describing humans involved in elephant interactions. Of these, statements of fear were most prevalent and yielded the richest understanding of perceptions about the risk of elephant-human interactions, including fear for human safety, fear for homes and crop safety. Traumatic response was reported, while sadness and grief were described. Two other themes were: i) animal welfare concerns, ii) frustration due to lack of government response to call for help. Popular media plays a critical role in shaping public understanding and can influence people’s emotional experiences, perceptions and management consequences.

The study highlights the fact that elephants are

stereotyped by the media, based on the isolated and sensationalized incidents. Wild elephants elicit a wide range of emotional responses among people, and there is often a wide gap between perception and reality of risk, when understanding whether it is possible for humans and elephants to co-exist peacefully. Hence, there is a strong need for media literacy

about the unintended or intended maligning of elephants to the general public, as the consequence can be social amplification of risk and the unwarranted persecution of elephants. Media need to be educated and sensitized so that it promotes responsible and balanced reporting. ■

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# Theory of evolution: A major expansion of logic

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Here the importance of the knowledge of “theory of evolution” is highlighted for common man for building a better world view. In western countries many books for lay man have been written for popularisation of theory of evolution. As a scientific discovery, it is considered to have highest impact on society after development of atom bomb. Creationism or design versus Darwinism is a popular debate topic recently in western world. In the context of prevailing misconceptions and blind faith caused by some sects, it can be even more important in our country to popularise the theory of evolution.

Human societies depend on religion for answers to the a range of questions like how the world originated, the future of universe, the origin and purpose of humans and their fate. The communities passed on the best available answers consolidated as religious revelations. For a long time religion not only satisfied the human curiosity but also defined rules for individuals and institutions supposedly for their welfare. These roles of religion are being usurped by more specialised entities like science, logic, law, philosophy and other institutions. Today Science gives more consistent and reliable answers to questions of origin of universe and other celestial or astronomical events we observe occasionally. Medical science explained phenomenon of body as well as healed the diseases. The advancements in physics and chemistry had been able to develop technologies that provide us many comforts today. These comforts also put people in the awe and reverence for science which was generally seen for miracle stories earlier. Today the governance is mostly through law. Philosophy today is an independent discipline advancing to deliberate on “what is right

thing to do”. At times the discoveries in science directly contradicted specific propositions of religion, putting the authorities of religion in an uncomfortable state. Galileo discovered that earth is circling sun whereas earlier texts specifically tell that sun is circling earth as anybody intuitively would conclude by observing the daily movement of sun only by naked eyes (<sup>1</sup>). Before discovery of microbes, various infectious diseases were purported as curse of the evil. The theory of evolution is developing recently as a major replacement to primitive concepts regarding origin of humans and other creatures, their purpose and fate. It is also making crucial contribution to development of psychology thereby understanding the nature of humans mind itself.

## Answers the evolutionary theory can give

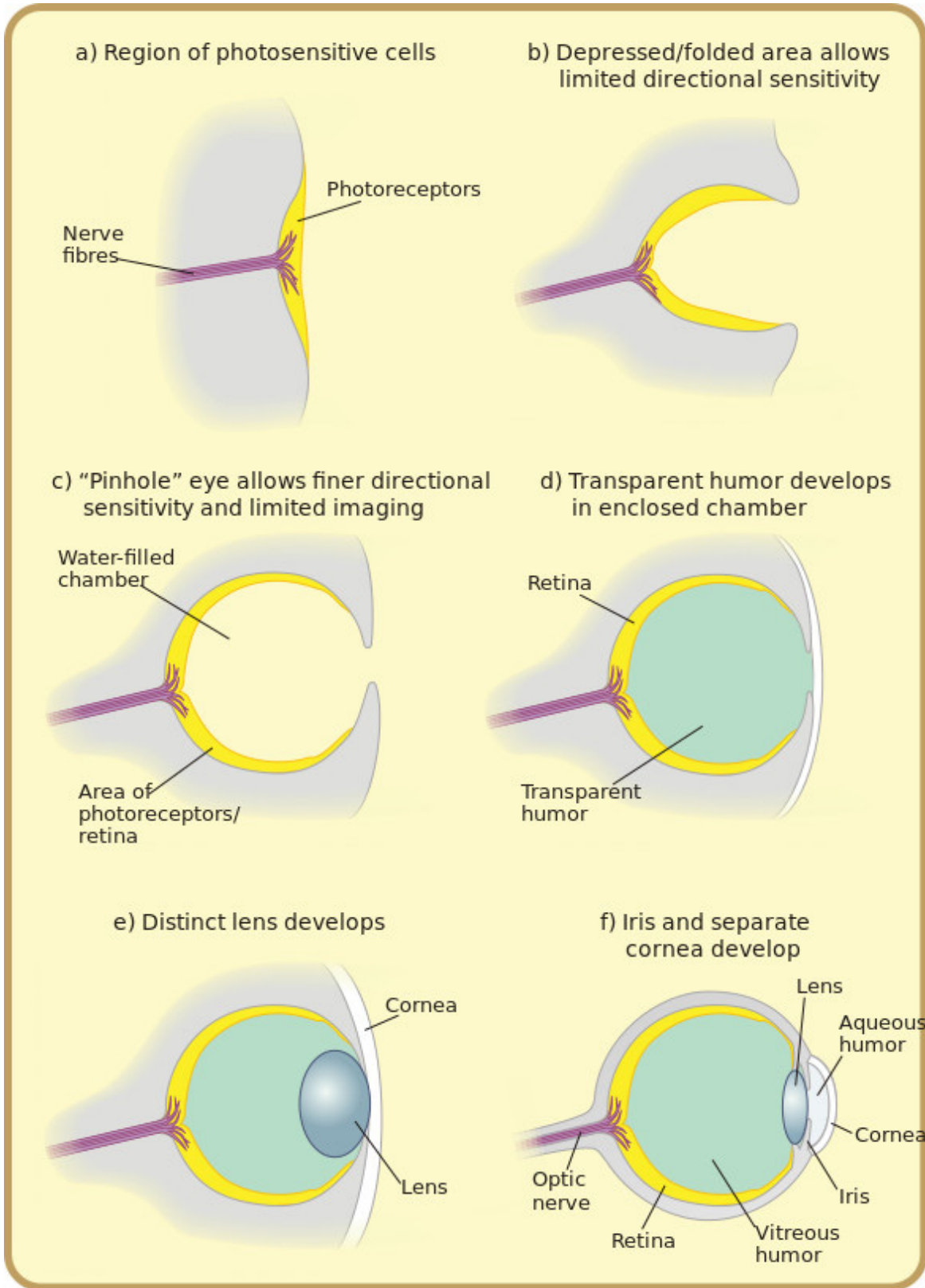
Creationism versus evolution in west has been a long debate. Most creationists explain the origin of amazing and complex living beings around us by invoking the concept of even more complex and capable being who could build these creatures. These answers are collectively called creationism. It is an intuitive answer with analogy of building machines and other complex systems by humans. But It is a paradoxical answer as it will create another question about creation of that super natural being. Whereas, the theory of evolution purports emergence of complex organisms from simple ones. The living beings have heritable characters which are passed on to next generation during reproduction but random and occasional changes in these heritable characters also happen which will generate new heritable characters. Accumulation of these new heritable charac-

ters in a sub-population can create even a new species if one of these new heritable characters become the reproductive barrier between sub-population and rest of population. Now since individuals of the sub-population are no more capable of reproduction with individuals of original population, they are by definition a new species and further accumulation of random variations in heritable characters will make it more distinct from the species it originated. Repetition of these branching events will keep expanding the list of new species which might have started from a very simple life form. This initial simple life form also originated from coincidentally non living chemical molecules coming together. At this stage the definition of life is molecules and systems that can make copy of themselves by using energy and material from surroundings. This evolutionary history has been traced up to simple RNA like molecules which store the information or template for their copying as well as has potential to catalyse reactions for making polymers like itself. Another important proposition in theory of evolution is natural selection. If such a new heritable character makes an individual more fit to environment then it will spread faster in sub-population as these individuals are more likely to survive up to reproductive stage. Whereas the harmful heritable characters arising out of random change are less likely to pass in next generation as individuals bearing them will lose out. This process will make more and more robust living beings, capable of surviving in adverse conditions and making faster and more copy like itself. The accumulation of these beneficial random changes in heritable character over time will create creatures which seem amazingly complex and efficient if we forget the long time and number of random trials involved. The evolution of eye must have started from a cell that become sensitive to light or photons<sup>(2)</sup>. Onward, the changes which are beneficial might have kept on accumulating like: more such cells, invagination of these cells for directional sensitivity, a layer of transparent protective cells on them, connected neurons for information transmission to other parts, a lens shaped protective cells, cells with color or wavelength sensitivity, fluid separating the lens and photosensitive cells for larger focus, a lens with variable focal length, more specialised neurons for information processing, etc., (Figure 1)<sup>(3)</sup>.

Other disciplines of science and engineering also use algorithms which is analogous to evolution and they are called evolutionary algorithm, genetic algorithm or Monte-Carlo simulation or random search. The cyclic process of making random changes and selecting the better solution or design can lead to an optimal solution or design which is a good strategy in complex situation where we do not have a feasible deterministic or comprehensive methodology<sup>(4)</sup>. Explaining the origin of wonderful creatures around us will remove the mysticism surrounding it which can be otherwise misused at times by orthodox figures. Daniel C. Dennett specifically explores the cause of religious mysticism in his book “Breaking the spell” from evolutionary perspective<sup>(5)</sup>. In western countries, many scientists have elaborated on these issues with implications for society and personal concerns in easy language. Very popular books written by Richard Dawkins for layman are: *The Blind Watchmaker*, *The Selfish Gene*, *The Extended Phenotype*<sup>(6-9)</sup>.

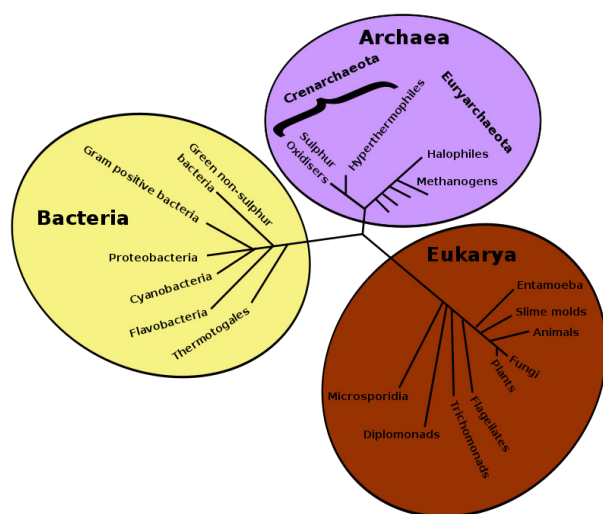
### Explaining complex behaviour and mind

Explaining some natural phenomena requires invoking concepts of sexual selection and kinship selection as an advanced form of natural selection in complex organisms. The new genes which increase the fitness of its host individual will ultimately promote its own copies in population by way of more reproduction. In sexual reproduction where an organism is complex enough to make choice of reproductive partner, the choice will be towards better genes and survival of progeny. This sexual selection creates a complex gender interaction in a species for maximising reproductive opportunities<sup>(7)</sup>. Kinship selection is about helping other genetically similar individuals in their survival and reproduction which results in indirect evolutionary success for similar and identical genes. This will also give rise to very complex social structures and interactions that can explain altruism for tribe members as well as suicide attack on other tribe<sup>(8)</sup>. In evolutionary psychology, brain is also viewed as an instrument for maximisation of survival and reproduction. This broad limitation put on function of brain helps in comprehending how it works<sup>(9)</sup>. It can be applied to understand the human society and behaviour of groups of various scale and nature. At times the theory of evolution



**Figure 1: Major stages of evolution of eye in vertebrates (Courtesy Matticus78 @ Creative Commons)**

has also been misinterpreted as portraying the world as dog-bites dog world. <sup>(10)</sup>. But Darwin was very scientific about his propositions that say, "survival of fittest". Fitness and survival is sometimes equated with only capacity to kill others, ignoring the significance of cooperation and symbiosis. The concepts of egalitarianism, enlightenment and ethics in modern human society are not negated by theory of evolution, rather they can be synthesized from theory of evolution with better understanding of their limits. Hamilton W.D. and George Price had started work in this direction in 1960s which has now developed into a discipline called socio-biology <sup>(11-12)</sup>. In conventional understanding the humans are also considered as most advanced of all species. Aristotle also depicted humans at top of a ladder in his "Great Chain of Being". The concept persisted even in initial drawings of evolutionary tree in which humans are at the top branch. But all creatures of present time are descendant of LUCA, having taken equal time to evolve or adapt to environment they faced. Some creatures are more complex than other, making them more robust in present environment but complex organisms adapt more slowly than simple ones in new conditions <sup>(13)</sup>. The modern depictions of uprooted evolutionary tree branching in all directions in a sphere is more accurate representation of evolution without hierarchy (Figure 2) <sup>(14)</sup>.



**Figure 2: A phylo-genetic tree of living beings**  
(Curtsey: Samsara @ Creative Commons)

## Origin of new creatures: The question of hen or egg first

The popularly asked question of whether hen arrived first or egg into existence has a paradox to say if egg arrived first then where it came from without hen and visa versa <sup>(15)</sup>. Whereas as per Darwinism the species hen must have evolved from a duck like bird. We can broadly say a duck laid the egg from which hen chick came out. Mutations in duck egg changed its appearance to look like hen we see today. But where then the duck came from, it also has a evolutionary history going back towards common ancestor with primitive birds, flying reptiles, reptiles, amphibians, fish, marine creatures up to LUCA (Last Universal Common Ancestor) <sup>(16)</sup>. The question of egg or hen coming first is invalid, as it really addresses a bigger question which requires a detailed answer.

## Implications for human health

Environments of evolution and modern lifestyle diseases can be taken into consideration. Many recently emerged diseases like obesity, tooth decay, hypertension, diabetes can be explained by theory of evolution's sub-concept "Environments Of Evolutionary Adaptation (EEA)". Our present day genetic makeup is a product of adaptation to the environment in which we lived for a long time in stone age. The salt and sugar which are very essential and high calorie molecules respectively, were very rare at that time. The heritable liking for these molecules helped individuals in surviving and thriving in that era but now in industrial age suddenly we have these molecules easily available. As of now we have not adapted to its overdose but our liking remains almost same. Therefore, salt and sugar are causing hypertension and diabetes respectively. In stone age and until recently humans had to run after or run away from animals for food or saving life. The exercise of muscles was naturally there. The exercise of teeth and jaw was also sufficient due to generally hard to chew food available. But mechanisation of daily work and food respectively are depriving exercise to our muscle and teeth, causing respectively obesity and tooth decay. Greenery and family members around were signals for time to relax but urban life is deprived of these signals which can cause ar-

tificial anxiety without any real scarcity of food or security (<sup>17</sup>).

### The need of popularising Theory of evolution

Since the brain is also an organ with ultimate purpose of evolutionary fitness, it provides a clear framework for its mechanisms. The painful and pleasurable feelings are for guiding our behaviour away from harms and towards evolutionary benefits respectively. Therefore, although everyone will seek an eternal happiness but painful feelings are unavoidable contrary to what some conventional doctrines promise. In fact desire for more happiness is exploited by the authorities to rule the minds of the people. Similarly, no person other than a few religiously purified saints can be free from tendencies that have evolved in human mind for reproductive success and survival. The purpose of human life and human tendencies is more accurately described by looking at brain as instrument for enhancing evolutionary success rather than unfounded propositions of relationship with the power. Although, religion is a consolidation of best available knowledge for living better and enlightened life but corrupt individuals in any institution may try to take undue advantage of people's vulnerabilities and faith. Even in today's time as well as in past, we see incidents of new ways of exploitation and cheating people through undue means. Theory of evolution is easy to understand, without the need of technical knowledge and it builds a world view which makes a person less vulnerable to such harm!

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AASSA-INSA-NISCAIR Regional Workshop on SHARE Communication

## Sustainable Development Goals: Communication Strategies



### Concept

The Sustainable Development Goals (SDGs), officially known as *Transforming our World: The 2030 Agenda for Sustainable Development*, are a set of 17 aspirational “Global Goals” with 169 targets between them. Spearheaded by the United Nations, through a deliberative process involving 194 Member States, and global civil society, the goals include ending poverty & hunger, improving health & education, making cities more sustainable, combating climate change, and protecting oceans & forests.

For meeting the challenges that confront the global populations, especially those in developing countries, a strong sense of urgency is required to seek solutions through innovative approaches to problems. These critical solutions, in turn, need to be promoted through effective communication to improve people’s lives.

Communication of scientific ideas and technological solutions could lead to positive societal transformation by empowering not only the public

at large, but also policymakers and political decision-makers to help them make informed decisions to smoothen development and progress.

The AASSA-INSA-NISCAIR Regional Workshop on “*Sustainable Development Goals: Communication Strategies*” organized by the Association of Academies and Societies of Sciences in Asia (AASSA), Indian National Science Academy (INSA) and CSIR-National Institute of Science Communication and Information Resources (CSIR-NISCAIR) during 16-18 November 2017 in New Delhi brought together a diverse array of partners to communicate the Sustainable Development Goals (SDGs).

Scientists, communicators and policy makers from South Asian countries like Japan, South Korea, Indonesia, Georgia, Iran, Afghanistan and India to deliberate on communication strategies and innovative initiatives in communication, especially in remote areas and for marginalized sections, risk and disaster communication, development communication, public scientific literacy, and communication

challenges in the digital age.

## Organizers

*Association of Academies and Societies of Sciences in Asia (AASSA)* was established in 2012 to promote solidarity and cooperation among the scientific and technological academies in Asia and Australasia. AASSA currently has 34 member academies representing 30 countries.

*Indian National Science Academy (INSA)* is the apex body of Indian science representing all branches of science and technology. Its objectives encompass promotion of science in India including its application for economic and social welfare, safeguarding the interests of the scientists and establishing linkages with international bodies to foster collaboration and expressing considered opinion on national issues.

*CSIR-National Institute of Science Communication and Information Resources (CSIR-NISCAIR)* is a premier institute engaged in scholarly communication to the scientific fraternity and public outreach of science for over six decades. The Institute is the only organization in the country that disseminates R&D information through 18 peer-reviewed journals and takes science to the masses through its three widely circulated popular science magazines. The Institute also organizes training programmes in science communication and science writing and offers platforms and forums for academic discourse on science promotion, governance, and policy.

## Day 1, 16 November 2017, Welcome Reception

Dr. Manoj Kumar Patariya, Director, CSIR-NISCAIR welcomed all the delegates from India and abroad to AASSA-INSA-NISCAIR Regional workshop on SHARE Communication. He said, the workshop will offer a medium for cross pollination of ideas which are vital for the growth of SHARE Communication in member countries. He also welcomed all for promoting uninterrupted flow of scientific information and dissemination between member nations on SHARE.

## MoU Signing Ceremony

The CSIR-National Institute of Science Communication and Information Resources (CSIR-NISCAIR) and the Indian Institute of Mass Communication (IIMC) signed a MoU to strengthen the science communication scene in the country. The agreement is expected to bring about a focused synergy that would not only lead to trained science journalists and science communicators but also open up new research opportunities in this area.



**Prof. K.G. Suresh, DG-IIMC, and Dr. Manoj Kumar Patariya, Director, CSIR-NISCAIR during the signing of MoU**

While CSIR-NISCAIR has at its mandate the objectives to take up new ventures in the field of science communication, dissemination and S&T information management systems and services, IIMC is a premier Institute imparting teaching, training, and research in the field of Mass Communication and Journalism.

Dr. Manoj Kumar Patariya, Director, CSIR-NISCAIR said, “Media-savvy scientists and science-savvy journalists need to be brought together on a common platform for effective and holistic science communication.”

Dr. Patariya also stated that this joining of hands between IIMC and NISCAIR could open up several avenues of collaborations such as in the field of creating scientific content in regional languages. There was also enough scope of targeted science communication training for multitudes of end-user groups, he said.

As part of the agreement, the two institutions seek to forge collaborative research projects and

short-term courses in Science Communication. “Science journalism today is more or less confined to health and technology reporting,” said Prof. K.G. Suresh, Director General, IIMC. “Students of journalism and mass communication need to be exposed to the innumerable facets of science journalism, which is required today to combat the various ills plaguing Indian society such as scientific illiteracy and superstitions. The outcome of this coming together of two institutions working in this area, therefore, would be very fruitful for the country.”

There was a huge possibility of expanding the scope of community radios in the country, which had not been fully exploited until now, said Prof. K.G. Suresh. He also lamented that while the coverage of science in the media was too low, often there was a misrepresentation of scientific facts due to journalists not being able to grasp the complexities of science. Prof. K.G. Suresh said that “the MoU has potential to change the way media covers science and also the way scientists look at media.”



**Prof. K.G. Suresh, DG-IIMC, and Dr. Manoj Kumar Patariya, Director, CSIR-NISCAIR signing and exchanging the MoU**

As the first step in the collaboration between IIMC and NISCAIR, a national conference was announced on this occasion which is to be organized during 21-22 December 2017 on India’s scientific wisdom. Very soon an international conference would also be planned.

Shri Hasan Jawaid Khan, Chief Scientist and Head, International & Popular Science Division, CSIR-NISCAIR presented the vote of thanks and remarked that joining hands is a great opportunity to work together in the area of science communication.

**SCIENTAINMENT: “Scientoon as a Tool for Communicating Science, Health, Agriculture, Environment and Risk”**

*Dr. Pradeep Srivastava, JCI USA Outstanding Young Person of the World Awardee*



**Dr. Pradeep Srivastava**

Dr. Pradeep Srivastava delivered an interesting exposition on how cartoons can be utilized to convey significant scientific messages. He has named his unique style of dissemination of scientific information through cartoons as “Scientoon”. Scientoons are cartoons based on scientific concepts. They not only make you smile and laugh but also provide information about new research, subjects, data and concepts in a simple, understandable and inquisitive manner. Through interesting cartoons, Dr. Srivastava showed how he could appeal both to the general public as well as policymakers.

**Day 2, 17 November 2017, Inaugural Session**



**Dr. Manoj Kumar Patariya, Director, CSIR-NISCAIR delivering the Opening Remarks**

**Dr. Manoj Kumar Patairiya**, Director, CSIR-NISCAIR, speaking on the relevance of institutions like AASSA, said that such agencies had become essential especially for developing countries where societies were facing problems different from those in developed countries. For instance, the lack of clean drinking water was a major challenge in developing countries leading to many ailments. He highlighted the role of SHARE communication and also the AASSA-INSA joint conferences held in the past.



**Prof. A.K. Sood, President, INSA, giving his Opening Remarks**

**Prof. A.K. Sood**, President of the Indian National Science Academy (INSA), in his opening remarks gave a brief idea about the role of INSA as an apex body which represents all branches of science. He said that communication strategies were integral to achieving the Sustainable Development Goals. However, there were significant communication challenges too, he said, including lack of public scientific literacy.



**Prof. Yoo Hang Kim, President, AASSA, delivering the Presidential Address**

**Prof. Yoo Hang Kim**, President, AASSA, said that for communication strategies to succeed, widespread collaborations between stakeholders was the need of the hour.



**Dr. Narender K. Sehgal, Former Adviser, Govt. of India giving the Inaugural Address**

**Dr. Narender K. Sehgal**, Former Adviser, Department of Science & Technology, Govt. of India and winner of the prestigious Kalinga Prize for science popularisation, said, “Rumours and misconceptions spread faster and last longer than good communication that we intend to educate the public with”. He further said that countering such misconceptions is not easy and takes extra effort. “We have a market for misconceptions,” he said, “and digital communication messages mainly serve to confuse the audiences further that we as science communicators intend to inform.”



**Release of Workshop Book. From Right to Left: Dr. P. Goswami, Director, CSIR-NISTADS; Dr. Manoj Kumar Patairiya, Director, CSIR-NIS-**

*CAIR; Prof. Yoo Hang Kim, President, AASSA; Dr. Narender K. Sehgal, Former Adviser, Govt. of India; Prof. A.K. Sood, President, INSA; Prof. Krishan Lal, former President, INSA; Mr S.P. Mishra, Deputy Executive Director, INSA*

**Day 2, 17 November 2017, Scientific Session I**

**AASSA Project on Food & Nutrition Security and Agriculture (FNSA)**

Chairing the first technical session of the Workshop, Prof. Krishan Lal, former President of INSA, gave a brief introduction of the AASSA project on Food & Nutrition Security and Agriculture (FNSA).



***Prof. Krishan Lal, former President, INSA and Prof. Yoo Hang Kim, President, AASSA chairing the first session***



***Prof. Krishan Lal, former President, INSA***

In his presentation, Prof. Yoo Hang Kim, President, AASSA mentioned about the IAP Inter Academies, which include IAP, IAC, and IAMP. There are four regional networks – Asia/Pacific, Europe EASAC,

America IANAS, and Africa NASAC. He emphasized on links between scientists and decision-makers, and said a scientifically literate society can have informed choice, promoting healthy food systems.

**Day 2, 17 November 2017, Scientific Session II**

**Sustainable Development Communication**



***Prof. Mooha Lee (right), Executive Director, AASSA and Prof. Finarya Legoh (left), Agency for Assessment and Application of Technology, Indonesia chairing the session***

The second scientific session was chaired by Prof. Mooha Lee, Executive Director, AASSA and Prof. Finarya Legoh, Agency for Assessment and Application of Technology, Indonesia.



***Dr. Mohammad Hakim Haider, Institute of Economics, Academy of Science of Afghanistan***  
In the first presentation, Dr. Mohammad Hakim Ha-

ider, Institute of Economics, Academy of Science of Afghanistan, gave a presentation on *Sustainable Development: Communication from a Development Perspective*. He said that SDG's is a multidimensional approach, which requires people's participation. He focused upon eradication of extreme poverty, avoidance of exploitation of resources, decrease in pollution levels, and the role of media in filling the gap between the poor and the policymakers.



**Prof. Hak-Soo Kim, former President, AASSA**

In the next presentation on *Fundamentals of Communicating SHARE*, Prof. Hak- Soo Kim, former President, AASSA said that there was no dearth of information providers, no lack of media channels and no lack of messages. All that was required was more of public engagement.



**Dr. V.K. Srivastava, President, Indian Science Writers Association (left) and Dr. Kamal Kapoor, Associate Professor, University of Jammu (right)**

While Dr. V.K. Srivastava, President, Indian Science Writers Association spoke about *Emerging Perspectives in Health Communication*, and the work done by ICMR in 41 villages where people suffered from protein-energy malnutrition, Dr. Kamal Kapoor, Associate Professor, University of Jammu, highlighted the merits of green chemistry.

## **Day 2, 17 November 2017, Scientific Session III**

### **Communicating Scientific Research, Promoting Scientific Culture**



**Prof. Finarya Legoh**

In the third scientific session, Prof. Finarya Legoh said that technology innovation and social culture can be linked by Integrating work elements like Knowledge of management, Promotion and marketing, Science and technology communication and Social Responsibilities.



**Miss Wiwi Syafarhadiati**

Miss Wiwi Syafarhadiati delivered a talk on *Spreading technology development outcomes through e-Media*, where she talked about the importance of social media in communicating science. She said that technology development has to be socialized.



**Dr. N. Murugan, Former Director, All India Radio, Chennai**

Dr. N. Murugan, Former Director, All India Radio, Chennai delivered a talk on the *Significance of Science Communication through regional languages to reach the unreached*. He highlighted the success of Radio and said it is the cheapest medium to reach people.



**Dr. M.A. Ansari, Professor, Agriculture Communication, GBPUAT**

Dr. M.A. Ansari, Professor, Agriculture Communication, GBPUAT, Uttarakhand, in his presentation on *Communication strategies for sustainable agricultural development*, explained the sustainable agricultural development goals as increasing agricultural productivity, increasing production efficiency, increasing farm profitability, and enhancing socio-political policy.

### **SCIENTAINMENT: “Sustainable Development – A Musician’s Perspective”**



**Dr. Ricky Kej, Musician & Grammy Award Winner, India**

Dr. Ricky Kej, Grammy Award Winner, and conservationist gave a musician’s perspective on Sustainable Development Goals. Dr. Kej gave live demonstrations of the hazards associated with climate change through his films and music.

### **Meeting of AASSA Special Committee on SHARE Communication**

A meeting of AASSA Special Committee on SHARE Communication was held in CSIR- NISCAIR Committee Room on 17 November 2017 late evening alongside the workshop.

### **Day 3, 18 November 2017, Scientific Session IV**

### **Communication Empowering Governance for SDGs**

In the last scientific session on 18 November 2017, in a session chaired by Prof. Yoo Hang Kim, President, AASSA and Prof. Kankan Bhattacharyya, Vice President (Science Promotion), INSA, while Prof. Avtandil Korakhashvili from National Academy of Sciences of Georgia, Georgia gave a presentation on *“Adaptation of Food Safety communication systems RASFF and INFOSAN in Georgian Cheese production”*, Prof. Iraj Malakmohammadi, University of Teheran, Academy of Sciences, Islamic Republic of Iran, presented his research on *“Communication Strategies to Empower Sustainable Development Technology Users in Digital Age”*.

Prof. Masataka Watanabe from the University of Tsukuba, Japan, presented his views on “The Sprout of Science: How to grow it in Society” highlighting the major programmes being organized in Japan in recent years. These include youngster Science festivals, Exhibitions, workshops, Science Agora, Folk Literacy, Science cafes, etc.

Shri V.P. Singh, President, Indian Science Communication Society, presented his views on “Human Resource Development in Science Communication”. He talked about the importance of developing our human resource to develop science communication. He mentioned that there is a need for creating positions of science communicators in our laboratories and research institutes, so as to fill the gap between scientists and the layman.

### Day 3, 18 November 2017, Round Table Discussion

#### SHARE Communication: Looking Ahead

The final component of the Workshop was a Round Table Discussion and Summing Up, chaired by Prof. Masataka Watanabe, University of Tsukuba, Japan and Prof. Avtandil Korakhashvili.



**Prof. Avtandil Korakhashvili from Georgia and Prof. Masataka Watanabe from Japan chairing the final session of the Regional Workshop**

While Prof. Kankan Bhattacharyya emphasised that education lasts for long and that social media is the best medium for science communication, Dr. Ankur Dutta, Associate Professor and Head, Department of Communication and Journalism, Gauhati University said that we need to encourage people to

get involved to bring about change in the society. He also spoke about the success and popularity of community radio across the world.

Shri Shabir Ahmad Shabir, Secretary, Student Welfare Association, Srinagar, spoke about the development and awareness programmes organized by his institution. Dr. Jagdish Chander, Advisor, International Cooperation, Department of Science and Technology, focused upon the hybridization of ideas, need for objectives and communication strategies to be adopted. Dr. V.K. Shrivastava said that Indian science writers are doing well, but it is not enough. While Dr. Murugan commented on the need for establishing a science channel, Dr. Mohammad Hakim Haider appealed to fill the gap between policymakers and the public.

### Day 3, 18 November 2017, Summing Up

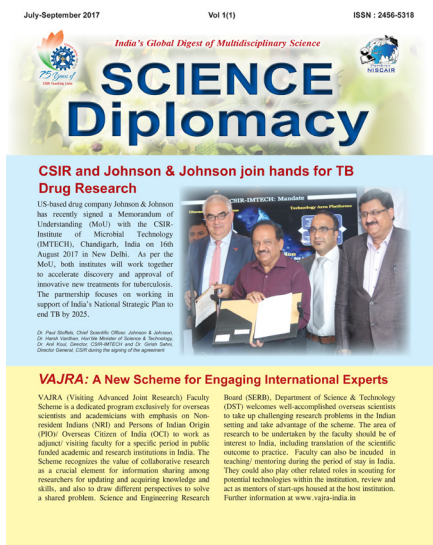


**Dr. Manoj Kumar Patariya, Director, CSIR-NISCAIR summing up the final deliberations of the Regional Workshop**

While summing up the deliberations of the AASSA-INSANISCAIR Regional Workshop on “Sustainable Development Goals: Communication Strategies”, Dr. Manoj Kumar Patariya, Director, CSIR-NISCAIR highlighted some of the strategies and best practices for SHARE Communication in the form of recommendations for member countries, which are summarized in the report. Prof. Yoo Hang Kim and Prof. Hak Soo Kim amongst others appreciated the successful conclusion of the workshop. Prof. Krishan Lal congratulated the CSIR-NISCAIR and INSA for meticulously and systematically organizing the workshop with active participation of all delegates.



# Science Diplomacy: Connecting top Indian science stories to the world



Science is universal and must reach out to all around the world. Good and true science is to be shared among the nations for the larger benefit of today's well-connected societies as scientific research transcends countries and continents. "Science Diplomacy" is an effort to share India's top scientific research, technological advancements, innovations and key policy aspects with different nations especially those who have science and technology cooperation with India. Today, something like 22% Indian research papers is an outcome of collaborative research with other countries. This engagement of our researchers and scientists with their counterparts in these countries shows the growing science diplomacy that India enjoys with many countries. CSIR-NISCAIR is the pioneer in science communication in general and scholarly and encyclopaedic publications in particular. Science Diplomacy is one of the recent initiatives of the institute towards its commitment to communicating and sharing science to all stakeholders and promoting science outreach and public engagement. Science Diplomacy also offers a platform to broaden and strengthen science and technology cooperation efforts further. Much of

the high quality scientific research gets highlighted through English journals published in India and abroad. A new avenue for taking the results of Indian scientific research abroad can be opened up if the research output could be conveyed in some of the major foreign languages as well in the form of a digest to be available in the main foreign languages besides English and Hindi. Science could thus be harnessed as a diplomatic wedge benefitting English as well as non-English readers across the globe by disseminating selected scientific breakthroughs and connecting larger readership both in English and non-English regions across the world to Indian science. Diplomatic missions, research and development organizations and institutions, science academies, universities, libraries and mass media, etc., in different countries, will get such relevant content in their respective language(s) in both print and online versions. The first issue comes in Japanese-English languages, to begin with, and subsequently will be made available in other foreign languages, i.e., Chinese, French, German, Russian and Spanish; other languages may be added depending on the need and feasibility.

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  2. Sharma R.D., *Communication of science and technology in ancient India*, *Indian Journal of Science Communication*, 1(1), pp 3-7, 2002. The sources such as unpublished papers and personal communications should also be included in the references in the following form:
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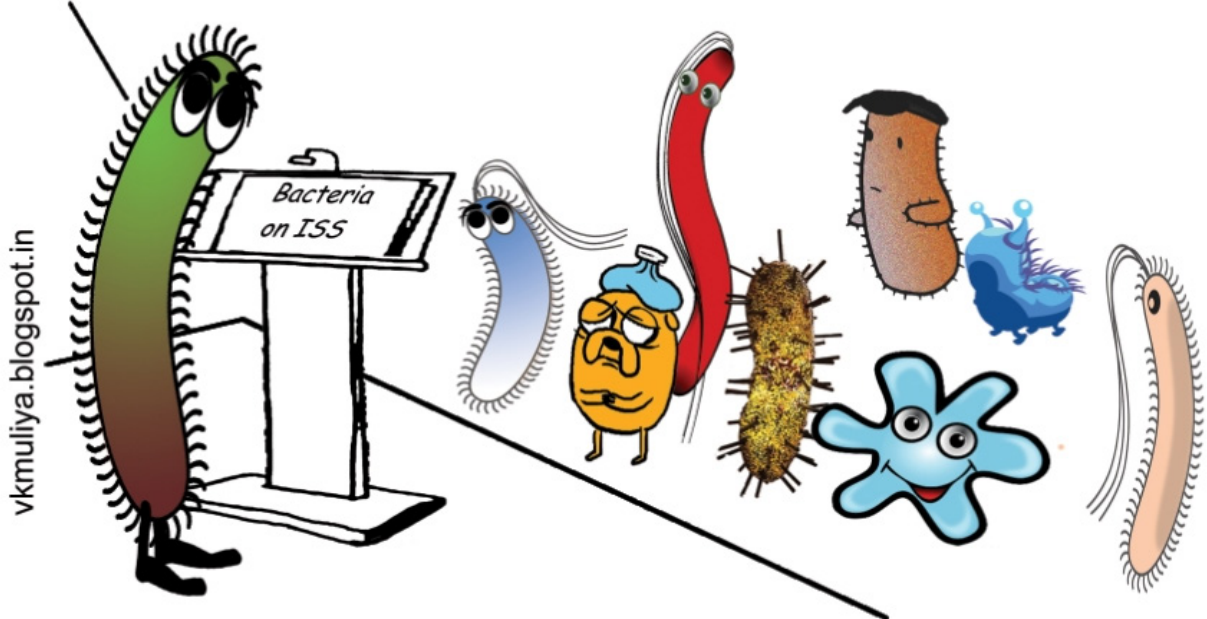
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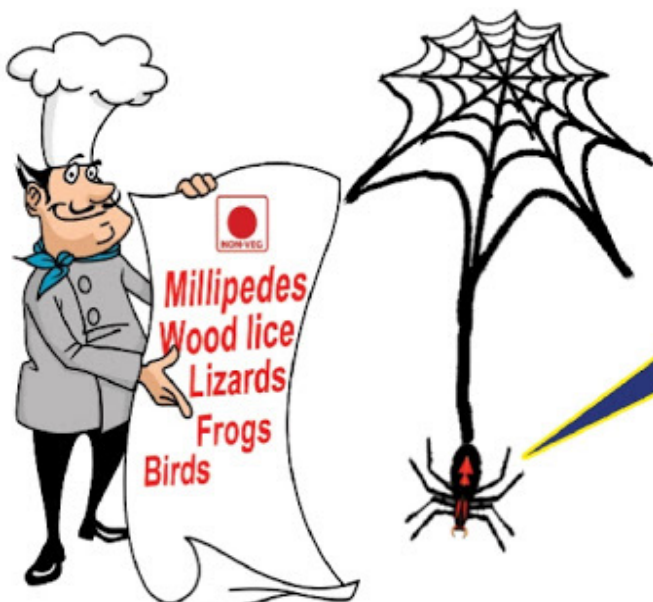
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Dear Bacteria,  
I am happy to announce that we are harbouring on the International Space Station too, and the most important part is, we reach there without any training or facility.



Reference: Checinska et al., Microbiomes of the dust particles collected from the International Space Station and Spacecraft Assembly Facilities, *Microbiome*, (2015) 3:50



Why only non-veg?  
Scientists have proven...  
I eat veg food also.

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Spiders are generally known as carnivorous, but recent studies are suggesting that they eat a wide variety of plant derivatives or parts like floral nectar, extra-floral nectar, stigmatic exudate, plant sap, honeydew, seeds, Beltian bodies, Müllerian bodies and pollen. Why spiders turning to herb diet is still not known.

Reference: Nyffeler et al (2016), Plant-eating by spiders, *Journal of Arachnology*, 44(1):15-27

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