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Communicating Science of Science Communication

Health communication through advertisements during health crises: A study

Traditional media for farmers' awareness to safeguard natural resources

Agriculture Poets' Meet: Communicating agriculture science through poetry

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Indian Journal of Science Communication

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"Scientific Indian" - A radio series on promoting scientific culture

The necessity of taking scientific knowledge and scientific skill to all cross sections of the society is now well recognized, as the maximum benefits of fast growing pace of the nation can be derived for the betterment of the society. Scientific messages and thoughts can inculcate scientific temper and scientific outlook directly or indirectly into the minds of people resulting into forging ahead an environment for the growth of scientific culture. Most of our actions and decisions are influenced and motivated by the knowledge we have and the attitude we apply. The right kind of knowledge and scientific attitude can further channelize and strengthen this phenomenon towards achieving a qualitative reasoning in decisions and excellence in actions, best combination of the two leads to a scientific culture! The scientific culture is not only important to fulfil the constitutional directive but is important to transform us into a self reliant, powerful and prosperous nation, where every citizen is identifiable as – Scientific Indian.

The All India Radio (AIR) - India's public service broadcaster, for instance, has an inherent objective of inculcating scientific temper and promoting scientific awareness among fellow citizens of the nation. It is high time to work towards meeting this novel objective as a public service broadcaster, especially at a time when the potential of science and technology has been well established in addressing a number of issues and aspects confronting the lives of the people at large, by way of mounting a variety of radio programmes spread across the entire networks catering the length and breadth of the nation. Due to its better and larger reach, easy affordability and simple technology, radio takes a front position in science communication activities around the world and India is no exception to this global trend. As the premier public service broadcaster of the country, All India Radio has continuously risen to the occasion when disasters, like earthquakes, cyclones, tsunami, floods, landslides, and accidents strike. All India Radio has its own internal Standard Operating Procedure (SOP) in place, which enables all AIR stations to swing into immediate action on their own in case of a disaster happening in their respective area. AIR stations, particularly those located in the disaster prone area, also carry out campaigns regularly for education of population at large. To further improve AIR's disaster management communication preparedness and performance, up-gradation and fine tuning of AIR's internal apparatuses, in technological as well as programming aspects, is a continuous process, which may be termed as a scientific way of working and following a scientific culture!

The overall coverage of All India Radio including Medium Wave (MW) and Frequency Modulation (FM) broadcast is 91.93% (area-wise) and 99.20% (population-wise). FM signals cover 31.54% area and 44.00% population, whereas MW signals cover 90.63% area and 98.41% population of the country. Looking at the potential and reach, the AIR has started a programme series under the title "Scientific Indian" in English and "Vaigyanik Bharatiya" in Hindi on the World Science Day, i.e. November 10, 2015. Other languages and dialects have translation or adaptation in the respective dialects. The series has a wide canvas and the topics covered are drawn from current affairs and general public interest depending upon different target groups, common man, children, students, farmers, women, workers or specialists, etc. The manner of presentation, language, subject content, and style determine the efficacy of the programme. It is important to ensure that the programmes do not interfere with sentiments of the people of different faiths while dealing with the intriguing issues of science and cultural fabric of the nation.

Importantly, scientific temper is a noble and ideal state to be achieved in absolute terms; however, the philosophy of science is believed to say that noting is absolute, so achieving an absolute state seems to be impractical! Therefore, we need to promote a scientific culture instead! Scientific culture may bring in some scientific temper eventually! Such as, Swachchh Bharat, Swasth Bharat, Good Green Deeds, peaceful coexistence, no food adulteration, Divyang friendly practices, solar passive and energy efficient buildings, and general civic sense, etc., can be considered as part of scientific culture. Moreover, culture has value system, respect, humility and humanity; whereas temper has almost none of them! Temper is more towards set frameworks, almost no room for human consciousness and conscience; culture is more towards humane, hence sustainable; so culture scores above the temper!

The one who: i) has general awareness of science confronting the day-to-day life; ii) is systematic and orderly in approach; iii) has an analytical and logical attitude and does not believe in superstitions and rumours unless verified; iv) is inquisitive and ready to reform in the light of new knowledge or evidence with a sense of being humane; v) innovative, creative, and enterprising, can be truly attributed to a Scientific Indian!

Dr. Manoj Kumar Patairiya

Health communication through advertisements during health crises: A study

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Health communication holds the key to address a health crisis emerging out of an outbreak of a communicable disease. Information provided by advertising is an important means to combat a health risk. Mass media have an important role to play during a health crisis. The mass media ought to have immediate impact on masses. Public policymakers and health officials depend heavily on publicity and information delivery through mass media to prevent the spread of disease. The present study suggests that during the time of health crises, in case of swine flu and dengue, the mass media publicity was proved instrumental in spreading awareness amongst people to help reduce the risk.

Introduction

A popular adage 'health is wealth' is not only important for an individual, a family, or a society, it is important for the nation as well. India's public health system has improved manifold since independence and largely the credit goes to the quality of public health education and communication.

Advertisements carrying appropriate messages targeting at the vulnerable populations for avoiding or curing a particular disease during health crises reduce the population's risk to expose to disease. It helps control various epidemic diseases. Intensive health campaigns nearly eradicated malaria through highly organized efforts in the 1950-1960s and later the attention shifted to other priorities such as family planning. After independence, health was given a thrust by the government. The responsibility of informing and educating about the good health was given to the media managers.

Despite increased consensus regarding the role of mass media in health crises, many changes have occurred over the last several decades that have recorded an increased importance on a specific mass media tool – advertising - to help combat social health problems. Recently, advertising campaigns against drug abuse, smoking and AIDS have been remarkable (Boller, 1991; Boydell 1991). Yet, amidst the urgency of these social and health crises, the study of the role of advertising during a health crisis such as swine flu was conceptualized.

Methodology

Data for the study were drawn from eight newspapers that historically appeal to a relatively large audience. All these newspapers have circulations in lakhs and ranked the top national morning dailies. Both English and Hindi language newspapers were chosen for the study to cover educated and elite calls as well as the lower and middle class population.

A content analysis of daily newspapers was carried out over a period of 6 months from May to October for three consecutive years to analyze the advertisements on health related issues. This period was selected purposefully because during this period incidence of parasitic afflicted diseases is quite high in comparison to other months of the year.

Observations

The analysis clearly shows that health related problems generally occur at the time of outbreak of certain parasitic afflicted diseases. In newspapers, the main thrust area was politics followed by advertisements. Based on results of content analysis, 53 health-related advertisements were identified from eight newspapers for the years 2007-2009. For all eight newspapers, the higher percentage of advertisements (36%) focused on products that alleviate or control symptoms. A similar percentage of advertisements (35%) focused on products that maintain general health. 24% advertisements focused on promoting nutrition, as contrasted with only 5% advertisements that focused on disease prevention (Figure 2). The individual levels of health education and awareness though influenced by advertising varied from person to person based on the quantity and content of health related information provided and read by different people in the advertisements.

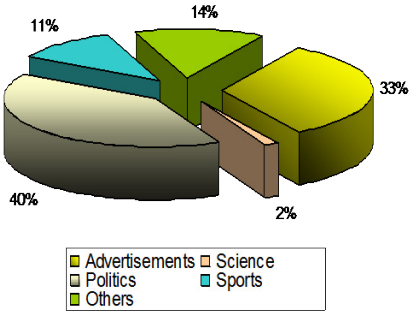

Figure 1: Total space provided for advertisements in newspapers

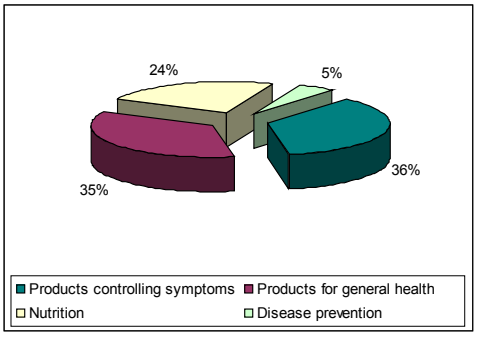

Figure 2: Health issues covered in advertisements

Discussion

The responsibility of informing and educating about the good health was given to the media managers. It was found during the feedback interviews that advertising does make wide impact on the people's behaviour and influences the overall societal response. Advertisements directly and indirectly influence the society in turning it to a health conscious society (Duerksen et al 2005).

Advertisements informing about the diseases caused by Mosquitoes: There are number of diseases caused by mosquitoes, like Dengue, Chikungunya, and Malaria, etc. Through advertisements in print media, the public is informed to take precautions to stop breading of mosquitoes, besides using mosquito net or mosquito repellents. Such protective measures adopted against mosquito bites help control diseases mosquito borne diseases (Figures 3-4).

Figure 3: How to control mosquito breading

Figure 4: Safeguard from diseases caused by mosquitoes

Precautions about water borne diseases: Almost every year, the monsoon season brings relief from the unavoidable summer at on hand and brings spurt in variety of diseases on the other. Timely advertisements in print media about the common water borne diseases and how to prevent them help control them at the raising head only. Mainly, these diseases are caused by bacteria, viruses and other microorganisms, which are transmitted through contaminated water (Figure 5).

Figure 5: Save yourself from water-borne diseases

News vs. advertisements

Feedback received from a survey clearly indicate the importance of the advertising through print media, and how advertisements are useful in giving news, information, education to help change the mindset of gullible people for various developmental purposes, including health (N. Sharma 2008).

Advertisements are like news, informing the masses about various issues. Advertisements have a wide impact on the people and influence the overall activities of the society. Advertising touches a whole range of human needs and tries to combine imagination with an understanding of human psychology. While news reporting is the main job of the media, which keeps changing with every hour and day, advertisements attract the masses due to its characteristics of repeatedness with persuasive nature. There are many people who may not be interested in news but they find advertisements interesting for them. Public health advertisements reduce a population's exposure to disease, which helps control various epidemics. Advertising through media as an important means of communication improves the health in general and educates regarding disease in particular. It tries to bring to the notice of the masses about various health problems prevailing in a society and tells as how they can be tackled or managed.

Conclusions

Advertisements through print and electronic media helped a lot in creating awareness about various diseases in India. To reach the maximum number of the audiences, especially in case of health related issues, advertisements bring desired results in spreading the information to the remotest nooks and corners of the country in regional languages to help control the diseases.

As a widely used form of media, newspapers enjoy a certain responsibility of communicating to masses. The study found that advertisements raised the awareness of health problems and their available treatments, as well as encouraged patients to seek more information. Patients with severe health problems were identified as being more likely to discuss a prescription drug with their doctor after having seen a related advertisement (MacRae, 2002). The implications suggest that the media, including newspapers and magazines, share part of the burden for improving efforts in health communication.

There are number of issues, which are addressed through advertising about health related concerns, i.e. drinking and smoking habits, cleanliness, healthy foods, etc. Enormous efforts on advertising of health information are put to improving working and living standards. While it is recognised that the advertising of health promotion messages may have an important role in health campaigns, the limitations of the advertisements cannot be ignored as many a times they remain unread or unnoticed.

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Traditional knowledge systems for environmental protection

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The genesis of contemporary science coincides with the Renaissance movement in Europe when intellectuals and thinkers began to question the then prevalent orthodox value system. It was the questioning spirit or inclination to doubt that led to inventions and discoveries. However, the vast knowledge base created as a result of probing secrets of nature is not necessarily new to human civilization. Other civilizations have created similar repositories of knowledge.In addition, the novelty of contemporary science lies in triggering the Industrial Revolution, which divided the world into developed and developing nations by endowing the developed world with economic benefits. Yet never before in the history of mankind has scientific advancement caused so much threat to the environment as it has today. The paper examines how revival of traditional knowledge systems has become essential to counter the destruction caused by so called development.

The challenges of modern science lie in the inability to integrate results and concepts arising from different levels of analysis, approaches and disciplines. The reductionist approach requires proposing models based on selected variables to explain natural phenomena and testing these models experimentally. On the contrary, traditional knowledge observes nature from a global point of view although strictly linked to the local culture and its predominant philosophy. Experts of pre-colonial Africa were well-versed in soil and climactic conditions required for crops. They had precise knowledge about the tropical flora, desert bushes and had developed a sophisticated classification system of plants. Mayans had developed a sophisticated calendar based on their observations of the Sun and stars. India had invented zero, numeral, and decimal system. The interdisciplinary nature of traditional knowledge and its synthetic and holistic approach may enable new ways of observing and studying complex phenomena.

Key Words: Renaissance, Colonization, Industrial Revolution, Interdisciplinary, Holistic

Origin of modern science

Modern Science has its origins in the Renaissance movement that took place in Europe between the 14th and 17th centuries. [1-4] The movement is considered the bridge between the Middle Ages and Modern Science. Renaissance began as a cultural movement in Italy in the Late Medieval Period and soon flourished all over Europe. It left an impact on literature, philosophy, art, music, politics, science, theology among other disciplines. The Renaissance movement had a humanistic approach and searched for realism and human emotion in art. Renaissance Humanism was a response to the orthodox and dogmatic approach associated with medieval scholasticism[1].

Is modern science so new?

However, the vast body of knowledge created as a result of observing nature is not necessarily new to human civilization.[6] Other civilizations have created similar repositories of knowledge databases. For instance, Mayan scientists in South America developed a highly sophisticated calendar through their observations of the Sun and the stars. American Indians and Australian aborigines have gathered an immense amount of biological knowledge based on their observations of nature. In pre-colonial Africa, specialists knew well the characteristics of the local climate and soil and were well-versed in conditions required for growth of crops. They had precise knowledge of tropical flora and desert bushes, and had developed a sophisticated classification system that divided plants into families and groups, based on their cultural and ritual properties. Science and technology in Africa were once quite advanced, comparable to European levels of the time, in the fields of human and veterinary medicine, agriculture, food conservation, fermentation, metallurgy and the preparation of soap and cosmetics.

[1]Scholasticism is the system of theology and philosophy taught in medieval European universities, based on Aristotelian logic and the writings of the early Christian Fathers and emphasized tradition and dogma [5]

Table 1: Comparisons between Ancient Indian Philosophy and Modern Science [7]

Indian Philosophy	Western Science
Brahmagupta's Lemmas (1150 AD)	Euler (1674) and La Grange (1768) rediscovered these Lemmas
Combination (Mahaviracharya, 850 AD)	Heriogone (1643)
Sulba Theorem, 800 BCE	Pythagoras Theorem
Rotation of the Earth (Aryabhata, 499 AD)	Leon Foucault, 1851 AD
Heliocentric Theory (Vedic Period)	Copernicus (1473 – 1543 AD)
Speed of light (Rig Veda, 6000 BCE?)	Oalus Roemer, 1676 AD (approx. computation)
Elliptical Path of Planets (Rig Veda, 6000 BCE?)	Johannes Kepler (1609 AD)
Embryology, Blood Circulation in Foetus (Vedic Period)	Heironymus Fabricus (1604 AD)
Surgical Instruments – Forceps (Susruta Samhita, 6th Century BC)	Analogous modern instruments are available
Classification of Plants (Susruta Samhita, 6th Century BC)	Carlous Linnaeus (1735 AD)

Industrial revolution and colonialism

The Industrial Revolution (1760-mid 1800s) is a landmark event in human history since the domestication of plants and animals. [8] It involved transition from hand production to machines, new chemical manufacturing and iron production processes, increased use of steam power, development of machine tools and rise of the factory system. An unprecedented growth was seen in average income and population. Along with the agricultural revolution, industrial revolution resulted in increase of living standards for the general population and the emergence of capitalist economies. [9-11]

Imperialism and Colonialism was a direct consequence of the industrial revolution. Factories in Europe and the United States required raw materials to produce goods and new markets were also needed to sell those goods. Thus began a scrambling for colonies in Asia and Africa. Factories also led to poor working conditions for the working class and led to the rise of trade unions.[12] However, the industrial revolution led to disfiguration of nature to the extent that is unprecedented in human history.

Sustainability- Call of modrn times

The rapid industrial and technological progress was accompanied by consumption of natural resources at an alarming pace. Scientists, thinkers and philosophers began to raise voices about 'environmental protection'. 'Sustainable development' was widely recognized as the requirement of modern times where development meets the needs and aspirations of the present generation without compromising the ability of future generations to meet their needs.[13] The three pillars of 'sustainable development' are economic, social and environmental.

Comparative analysis between modern science and traditional knowledge [14,15]

The challenges of modern science lie in the inability to integrate results and concepts arising from different levels of analysis, approaches and disciplines. The reductionist approach requires proposing models based on selected variables to explain natural phenomena and testing these models experimentally.

Traditional knowledge is a complex system of integrated information about the relationship of events, plants, animals, and the cosmos developed over thousands of years to enable people to lead fulfilling lives in harmony with nature. It is held by indigenous people and provides detailed understanding of the natural, cultural and spiritual worlds. It is based on thousands of years of observation and experiment. It is holistic in nature and represents a value system.

Similarities

- Both operate in a systematic manner
- Both are based on field observations and experimentation
- Both create hypotheses to derive relationships
- Both create predictive models
- Both are moderated: Science by peer review and TK by elders
- Interpreting TK and Science requires expertise

Differences

Table 2: Differences between Modern Science and Traditional Knowledge

Modern Science	Traditional Knowledge
Intellectual	Spiritual, practical and experiential
Research method but sometimes results in western lifestyles	Way of life so it is shared knowledge
Predictive, based abstractions of nature into models	Predictive, based on indirect relationships
Accumulates knowledge by documentation	Accumulates knowledge by oral traditions such as stories, songs, practices and dance
Aims to understand the physical universe	Aims to understand all Universes
Requires extensive and diverse infrastructure	Requires extensive and diverse protocols
Analytical and tends to identify influence of individual variables	Holistic and focuses on integrating information
Variables are not meant for belief systems	Variables can be derived from spiritual understanding and beliefs
Avoids moral and spiritual values in results	Value system
Not practical but yields technology, techniques and knowledge which is practical	Practical knowledge

Doubts cast by modern science about traditional knowledge

- Distrust of non-scientific data
- Uncertainty about accuracy and precision of data
- Skeptical about dealing with sacred information
- Stereotyping of TK as data-level information only
- Dismissal of non-familiar indicators of change in biological systems

Working together for the benefit of mankind

- The two knowledge systems complement each other
- Working with both knowledge systems will benefit humanity in general
- Sum of two knowledge systems generates a greater knowledge base at the data, relationship and predictive levels
- Using both systems reduces rather than increas-

es the complexity of working with the Environment

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RESEARCH PAPER

Science Riddles: An effective pedagogy in communicating science to students

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In recent studies, it has been inferred that teacher's quality is one of the most important contributing factors to student learning. Students often perceive general science to be a list of obtuse principles to memorize that hold no importance outside the classroom. Too infrequently does this class offer students a clear picture of what really science does and the way the science is related to their everyday life? In an attempt to engage students in the process of learning and to make their science studies relevant to the world they inhabit, the author has developed a strategy called riddle making. Riddling is – "What You Do Is What You Get (WYDIWYG)" philosophy. The author has explored riddling technique to make relatively complex concepts in science as easy solutions. One of the main advantages of this technique is that it is based in a primary building block we can construct the whole concept, during the riddle construction process, the degrees of freedom for the students are not restricted and therefore this gives the learner a greater orientation towards beauty of science. Further most students find riddling as an easy and fun learning to solve doubts in science concepts. As a result of making riddles, the intimidation caused by these types of problems is diminished and most of them are able to learn the most complex concepts quite readily. This method intends to give students more insight into how simple riddles can help them arrive at the basic understanding that is needed to solve problems. The present paper describes the beauty of science riddle making and the role of teacher in students' learning process. The author is practicing riddle making since last five years and has got immense response from students as well as practicing teachers. He is having collection of over five hundred riddles to his credit.

Key Words: Riddle, Constructivism, Learning process

Introduction

Science communicators and educators always search for the better method of communicating science which evolves as a separate field continuously. For many years, major technological developments have transformed our lives without there being any apparent choice. At the same time, scientific research has produced a more and more dense and complex body of knowledge, less and less accessible to the layman. As a result, sciences are becoming each day more unknown and strange to the general public due to which pure science education is witnessing declining trend in our country which is evidenced from Annual Status of Education Report (ASER) (Rural) 2011, which depicts a shocking picture of level of learning in rural schools in India and says the learning level at rural schools are declining alarmingly. The most urgent task is to raise the quality of science education at school level so that individuals are able to develop skill sets to meet their immediate and future needs as creative member of society where pupils are set on a path to explore and understand their own true nature and their relationship with environment and society. This require a holistic integration of activities that lead to the development of learning culture in schools so that our students can compete with their global counterparts in terms of quality and excellence. Such an activity is riddle making in science.

Science communication at schools and colleges

According to India Science Report 2005, the science learning data was alarming:

- At the class VI to VII level 22% of the students said they would like to study pure science at higher levels of education. Yet, when it came to students in class XI and XII just 13.4% wanted to study pure science at the graduate or post-graduate level.
- Most of the teachers believe that more computers or equipments were required for teaching science subjects as inadequate practical training was a serious issue. While 15% felt that teachers too required proper training, 11% felt the need for simplification of the course content.
- India scores lower than the US on attitudes towards science and technology, but not much lower. 77% Indians feel S&T makes our lives healthier and easier as compared to 86% for the US. 61% feel technology makes work interesting as compared to 89% in the US.
- In general, inadequate conceptual understanding is one of the common obstacles that science students face at senior secondary and undergraduate level. This situation is exacerbated by the lack of incentives and interest.

Science riddles

In chemistry too many facts in the form of preparations, properties, reactions, formulae, equations, and uses, etc. are presented which make it difficult for the student to grasp and assimilate the right perspective. Here comes the role of teacher. Even the most abstract concepts in chemistry can be illustrated by the examples or by analogies by the teacher. The sole purpose of chemistry lecture is to capture students' attention to the subject and to make the lectures interesting. Till today, various methods of teaching in chemistry are suggested and available in relevant literature. However, the author suggests that some simple riddles can be used effectively to make students interact in class. This method requires the student to provide answers to riddles in order to develop the discussion about a given topic. The riddles asked need not involve a quantitative problem, but are simply a means for evoking the material being discussed, as opposed to presenting it as a lecture. Here are a few examples from different dimensions:

Riddling is a constructivists paradigm

Constructivism is a theory of learning which claims that students construct knowledge rather than merely receive and store knowledge transmitted by the teacher. Constructivism has been extremely influential in science and mathematics education [a]. Constructivists believe that effective learning demands not just discovery of facts, but the construction of viable mental models, and that teachers must actively *guide* the student in this effort. The task of the teacher in the constructivist paradigm is significantly more difficult than in the classical one, because guidance must be based on the understanding of

each student's currently existing cognitive structures. Riddle making succinctly fits to the principle of constructivism where teacher provides the necessary conceptual input and the learners construct their own knowledge. Here the nature of knowledge (it's individually constructed; it is inside people's minds, not "out there" i.e. inside – out process rather than outside – in process.

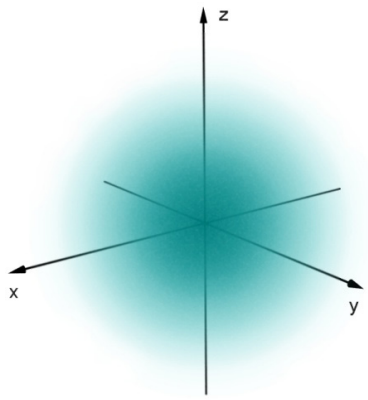
Examples

Example 1: In global warming phenomena,
I am in 1:2:2 compositions.
It comprises two different halogens and carbon,
With UV rays I undergo chemical disintegration.
Who am I?
Chlorofluorocarbon (CFC)

Explanation: *CF_2Cl_2 (Freon-12/ Du Pont) Concepts covered: Global warming, green house gases, UV rays, decomposition reaction, Montreal protocol, ozone layer depletion, uses of CFCs, etc. A chlorofluorocarbon (CFC) is an organic compound that contains only carbon, chlorine, hydrogen and fluorine, produced as a volatile derivative of methane and ethane. It is also called as Ozone depleting substance (ODS) and depletes ozone layer and causes skin cancer due to direct penetration of UV rays which is a great environmental risk. The most important reaction of the CFCs is the photo-induced scission of a C-Cl bond:$CCl_3F \rightarrow CCl_2F + Cl$. The chlorine atom, written often as $Cl\cdot$, behaves very differently from the chlorine molecule (Cl_2). The radical $Cl\cdot$ is long-lived in the upper atmosphere, where it catalyzes the conversion of ozone into O_2. Here ozone decomposed to oxygen. Montreal protocol restricted the use of ODS and safe use of alternate to CFC which are conventionally used for refrigeration and aerosol.*

Example 2: I am the lightest part of an atom,
I was discovered by J.J. Thomson.
I am in outer part of an atom,
And initiate many chemical reac tions.
Who am I?
Electron

Explanation: *Concepts covered sub atomic particle, chemical reaction initiation, orbital concepts of atom, J.J. Thomson's discovery. The electron (symbol: e−) is subatomic particle discovered in 1897 by J. J. Thomson and his team of British physicists. It is produced in the process of photon collision, i.e. $\gamma + \gamma \leftrightarrow e+ + e-$. In quantum mechanics, the behaviour of an electron in an atom is described by an orbital, which is a probability distribution rather than an orbit. In the figure, the shading indicates the relative probability to "find" the electron.*



Orbital s ($\ell = 0$, $m_\ell = 0$)

Example 3: Cities consume me more than vil lages,
In plants and factories, I'm used for running machines and other purposes.
In homes, hotels and hospitals I'm used for cooking, heating, cooling and lighting,
In railways, I'm used for goods and passengers transporting.
Who am I?
Electric energy

Explanation: *Concepts of electric energy and its various day to day applications can be covered.*

Example 4: I'm the fuel which you can procure or produce by yourself,
I'm the by product of fermentation process.
Any one can produce me from animal dung,

vegetables or in rotten substances,
I'm called as fuel of biomass.
Who am I?
Biogas

Explanation: *Concept of Biogas and its production, sources of generation can be discussed successfully.*

Example 5: All of you use me for cheap ornaments.
I am found in jewelry shops.
I am not expensive as other metals.
Who am I?

Explanation: *Silver (Ag)*

Example 6: I am a light, highly reactive gas
I'm used as automobile gas.
I produce water vapour as exhaust gas
I am the fuel of millions first choice.
Who am I?

Explanation: *Hydrogen (H_2)*

Example 7: I am very abundant in nature and found in every organic matter,
You can see me many forms like graphite, diamond and fullerenes.
It is possible through the property of catenation.
Who I'm I?
Carbon (c)

Explanation: *Teacher can explain the concept of carbon, its occurrence, physical properties, allotropic forms of carbon, organic compounds, etc.*

Example 8: I am a liquid and blue in colour
Less viscous, lighter than water,
People use me as I'm cheaper than petrol.
Also used for storing sodium metal.
Who am I?
Kerosene

Explanation: *Various physical and chemical features of kerosene can be discussed by teacher in addition to its applications to common man's life.*

Example 9: I'm a part of electromagnetic radiation
I can check the fractures in your bones,
I was discovered by Roentgen
I am produced due to bombardment of neutrons.
Who am I?
X-ray

Explanation: *Concept of X – ray and its various application to be covered by the teacher.*

Example 10: I am an ideal body.
I can emit all frequencies, I can absorb all frequencies,
You can't compare me with any body.
Who am I?

Explanation: *Black body*

Example 11: I am smallest energy packet,
I am emitted in packets also absorbed in packet.
It was discovered by Max Plank.
Who am I?
Quantum

Explanation: *Teacher can discuss various interlinked concept around Quantum.*

Example 12: I am electromagnetic wave, come from the Sun
On high exposure I can create harm.
Also cause skin cancer in humans.
Who am I?

Explanation: *Ultraviolet rays.*

Role of teachers

The teachers' role in this process is to facilitate students through asking provocative questions to the

students and also encourage them to frame their own questions on the problem at hand. Also teacher should teach the students to be aware of what they already know, what they want to learn, and what they have eventually learnt (KWL strategy). Teachers need to adopt the strategy of PQ4R method, i.e. Preview, Questions, Read, Reflect, Recite, & Review [c].

Conclusion

Science teaching in schools and colleges aims at the fulfilment of the goals of education that covers a wide range of intended targets, i.e. the intellectual, personal and subject-society interface. Conceptual learning in science subjects needs to be approached in a relevant manner, but also the teaching must not lose sight of the fact that the attitudes, communication abilities and personal attributes amongst students (such as creativity, initiative, self paced learning) need to be developed. Riddling found to be more appropriate, easy to do, students' friendly pedagogy that not only enhances interest of the learner but also offers a greater platform for teachers to integrate most difficult science concepts in a pleasant way of riddles. We have to keep in mind that learning for understanding in classroom requires well-designed hands on, as well as minds on, activities that challenge students' existing conceptions leading students to reconstruct their personal theories. Every science teacher should emphasize the quality of our students' understandings rather than just surface learning or their test scores. Because conceptual understanding is crucial and it should be a focus of our interest in science teaching, we need to promote conceptual learning over rote memorization.

If we are to champion science and technology popularisation among our students, we need first of all to improve the dilapidated learning image of our schools. We must understand that S&T literacy cannot remain a peripheral activity but is becoming a strategic necessity of future. Science teachers should call attention to the process of science rather than just the content, because students who understand the process are better prepared to acquire science content on their own (Basili & Sanford, 1991). Today's teachers should not just consider themselves teachers but also students of learning [b].

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A TV series "Hopper Race" on overuse of insecticides in Asia: An appraisal

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Most people call it hopper but some scientists call it Brown Plant Hopper (BPH). Clinging to rice stalks down low and out of sight the hoppers stick sharp tubes into them and drink the sun-drenched nutrients in the sap. After a group of hoppers have finished feasting, the rice plants turn brown and the entire field dries out. Because they multiply quickly and there are so many, the farmers call them "pests" and have come to really dislike hoppers. BPH is an insect that causes devastation in paddy crops mostly in Asian countries, also known as Rice Hopper. People used lots of insecticides and hired lots of people to spray. At night, they swarm around the street-lights. They're drawn to light farmers can't even open windows. In the evening they become spirits and fly up out of the paddies. Hopper Race is a TV series produced in collaboration with TV for Environment (TVE) Japan, TVE Asia Pacific, International Rice Research Institute (IRRI), Philippines, with language versions in 8 Asian countries. TVE Japan partnered to adapt and distribute "Hopper Race" documentary in Asian countries. Juka Kawaii, Producer, TVE Japan; Monina Escalada, University Professor, Visayas State University, Leyte, Philippines; K.L. Heong, Principal Scientist, International Rice Research Institute, Los Baños, Philippines were amongst the team members. The environmental TV documentary "Hopper Race" has 10 stories, each one about 7-8 minutes long. The first part of the film was launched in November 2012 at the International Rice Plant-hopper Conference with a synopsis of the film and a trailer. The final film was translated and disseminated in the Asia-Pacific region in 2013-14. The film is about rice pest awareness and management, particularly rice plant-hoppers that have been causing extensive crop damages and have become a big problem economically and socially in many Asian countries. The appraisal of the film was carried out by the author, who was also part of the project, and it emerged that the film is a powerful educational tool to promote sustainable agriculture and to increase biodiversity in rice landscapes. The Hindi version of the film was well received and appreciated in India especially among farming communities.

Brown Plant Hopper enjoying on paddy leaf

An overview

In recent years, there were outbreaks of rice plant-hoppers in China, Vietnam, Thailand, Indonesia and elsewhere. Researchers from these areas gathered and began to search for a solution to this problem. Scientists went to the fields and asked the farmers what they did to their fields. We found that farmers who control this insect have an 86% chance of getting hopper burn. That means they sprayed for the insects, but the insects were not serious. Officials from the Thai Rice Ministry also involved in the project, where rice is a major export, the main cause of hopper menace is the spray. No problem to give them a new variety but we must tell them the new one is resistant, don't spray. Thailand right now is a good example. The response will be farmers will spray more, put more fertilizers and plant more times. This is the recipe for hopper outbreak. Hoppers are only 3 to 5 millimeters long but scientists and officials from all over Asia are fussing all over! Damage from the brown plant hopper had spread through 18 of Thailand's 25 central provinces!

Rice-hopper affected paddy fields: Thailand's rice bowl, one third of country's rice produced.

There are thousands of varieties of rice from different parts of the world. These varieties sometimes have natural defenses. And these defenses are coming from the genome of the rice. There might be several genes or a single gene, a very strong gene, or there are lots of different genes. So what breeders do! They screen varieties, and they find which varieties have resistance for BPH. And now with modern molecular tools they can make sure, by checking, because we know the sequence of the gene or sequence around the gene, you can check to make sure that gene is passed to offspring through breeding, the natural process, just crossing plants, taking the pollen and so this breeding produces resistant varieties.

Through natural and human selection, a wide variety of rice plants have been passed down across these many years since rice's first production back in ancient times. Some from among those thousands of native species were found to be naturally resistant to plant-hoppers. Some don't taste good to the hoppers, others, remarkably, lessen the hoppers' reproductive power. In recent years, humans have used these naturally resistant rice plants to interbreed new strains. There are more than 1,00,000 rice varieties in the world.

If you spray insecticides against plant hopper, it's like spraying gasoline into fire. Says Dr. Heong of IRRI. Plant breeders and scientists around the world worked diligently and passionately to develop varieties that were resistant. They succeeded with this only to face a new, unforeseen problem. And they produced a variety called IR-26 that had a resistance. Initially, there was a decline in hoppers and people said, "ok, this is very good, it's working". Then after a few years they started to see the hoppers were able to feed on this variety. So really, it only took two years before the variety was completely useless because the hoppers had adapted to this resistance. So the next thing that the scientists did is, "ok, let's introduce a new one". And they introduced varieties with BPH-2, the next variety.

The government of Indonesia, for example, wanted to replace 50% of their rice with IR-26. So it was growing everywhere, and because of that, it broke down very quickly. Already a number of genes don't work. So BPH-1, BPH-2, BPH-4, BPH-8, BPH-9, BPH-21, BPH-22, all these don't work anymore in some populations. So basically it's always a battle between producing a new variety that is resistant, and the hoppers overcoming the resistance. Brake down means plant-hopper adapted to or overcame the resistance. Of the 34 genes discovered thus far that are resistant to the brown plant-hopper, 30% are said to have already lost their efficacy. Because rice is the brown plant hopper's only source of sustenance these tiny rice specialists are quick to adapt. Will we be able to develop new strains quickly enough to keep up with them? Interestingly, hoppers form large groups, gigantic genetic pools.

Then, in only a month, they create the next generation, offspring who represent every possible genetic combination. This is the secret to their ability to adapt. Brown hopper only lives on paddy. It cannot live on another plant. So it is completely dependent on paddy. Now, if you are completely dependent on one type of food, you will need a biological system that you can adapt to any change in the food in order to survive. If you don’t, then you go extinct. So, it’s a strategy, their own life strategy, the ability to adapt to environment.

Sucking the paddy shoot

Northern Vietnam has also been hard hit by the hoppers, but in a village near Hanoi a strain of rice that is resistant to the hoppers has been grown successfully without a decrease in its resistance for many years. Why haven’t the hoppers been able to adapt and proliferate here? CR84-1 variety is resistant to hoppers. Farmers plant in the winter but not in the summer. This is sticky rice used to make cakes and green rice flakes.

The farmers tend to spray over and over and over again. They try to kill hoppers by piling on the chemicals. With each application many of hoppers die, often because of damage to their nervous systems. But a few special ones among them are somehow able to resist these poisons. These few have genetically resistant capability. The few that survived will eventually become the next generation, which we call resistant generations. So they’re adapted. The new generation will become adapted to the poison. So pesticides spraying provide selection pressure. Selecting those that are resistant. And then the resistant ones become dominant. The more insecticides the farmers use and the more potent the hoppers are becoming, the chosen ones, those who adapt to changes in the paddy crops and in the chemicals, live on and go on to the next generation.

By enriching the rice’s ecosystem, by promoting an approach called “ecological engineering,” Dr. Heong hopes to suppress an outbreak of the insects. One strategy is to reduce pesticides’ use. Especially certain groups of pesticides which are very toxic to natural enemies and restore the biological control which the rice ecosystem has. Another way is to enhance the biological control system by growing and increasing the floral biodiversity so that arthropod biodiversity can be enhanced. Therefore, the migratory hoppers arrive into the rice field with strong ecosystem service, they had little chance to survive or at least very little chance to multiply to such high proportions. That’s the way to control it. Planting flowers and other plants along the furrows, Dr. Heong seeks to enrich the paddy’s ecosystem. For example, oligosita is an egg parasite of the brown plant-hopper, but the farmers don’t know and they spray, so all the oligosita die. It can control the hoppers, if the farmers don’t spray.

Hopper Race: A TV film series

TVE Japan, in cooperation with TVE Asia Pacific, organized a series of workshops in different Asian countries to discuss and finalize in-country plans to disseminate the film throughout the Asia Pacific region. Workshops’ participants included experts from Japan, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Thailand and Vietnam. Mr. Shukichi Koizumi, Chairman of TVE Japan underscored the role of the video in sustainable agriculture. He said that the hard work for 3 years putting the film together and subsequent phase of dissemination are very important from the point of view of farmers if they can be motivated to judicious use of insecticides and pesticides.

Mr. Kenichi Mizuno, executive producer, TVE Japan, spoke on the making of the video and thanked partners and institutions that facilitated its production, particularly the International Rice Research Institute. Ms Juka Kawaii discussed the language versioning and dissemination plans for the documentary and outlined the guidelines and criteria in customizing the programme. The film script was developed in close cooperation with IRRI scientists. Then shooting was carried out in different countries, including the Philippines, Thailand, and Malaysia, etc.

Scientists, subject and mass media experts were involved throughout the implementation of the project from planning and formulation to execution and implementation including evaluation. The film was then translated in languages' versions in a span on one year in at least 6 Asian languages. VCDs were produced and distributed; the film was broadcast over TV educational programmes and in other training programmes. Other resource persons included Dr. K.L. Heong of IRRI, Monina Escalada of the Visayas State University, Mr. Kukiat Soitong and Pornsiri Senakas of the Thailand Rice Department.

Dr. Heong discussed the plant hopper problem in Asia and emphasized its importance to the sustainability of rice production and the need for policy engagements to reduce insecticide misuse through structural reforms in plant protection services. Dr. Monina Escalada presented the use of entertainment-education principles and process in biodiversity conservation, highlighting the on-going award winning TV series on ecological engineering broadcast by TV Vinh Long in the Mekong Delta. Mr. Kukiat and Ms. Pornsiri presented the Rice Department's efforts in dealing with the brown planthopper outbreaks that have caused massive crop losses and miseries to thousands of farmers in Thailand over a decade.

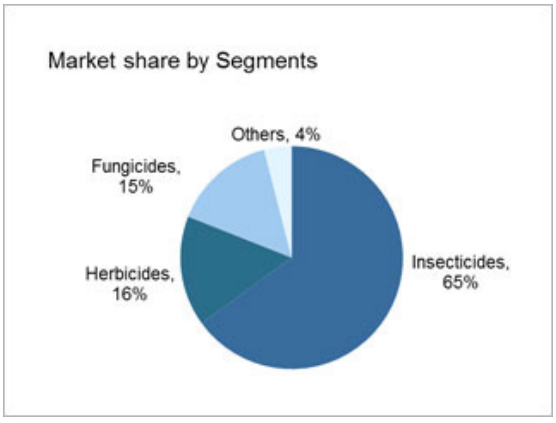
Film dissemination and outreach in India

The 10 part series gives an understanding of perils of overuse of chemicals.The series was telecast in India on National TV Network – Doordarshan in Hindi in Krishi Darshan programme, promoting natural bio-control and sustainable solution. The viewers comprised farmers, village development officials, scientists, journalists, communicators, broadcasters, and common audiences. The telecast of the film in Krishi Darshan Slot of Doordarshan - India's national TV channel offered a tremendous outreach to millions. Apart from routine viewership, arrangements were made for dedicated viewers through some NGOs in different parts of the country.

The video programme was distributed through various training and orientation programmes on science, agriculture, environment, and health communication.

Film preview at Pratapgarh among village representatives

The Hindi version was distributed to various associated groups engaged in science communication, i.e. Indian Science Writers' Association, National Council for Science & Technology Communication, Science Technology and Development Initiative, MTS Academy, and Basant Seva Sansthan, etc.The groups have subsequently taken it further to remote areas through outreach programmes and activities.



Telecast of film on Krishi Darshan programme of Doordarshan

The video was also uploaded on websites for free viewing/ download.It was distributed through e-network of communication professionals engaged in science, agriculture, environment, and health communication.

Krishi Darshan: An agriculture show on National TV Network

A daily programme (5 days in a week) in collaboration with the Indian Ministry of Agriculture, Govt. of India, under the scheme Mass Media Support to Agriculture Extension is telecast between 6:30 - 7:00 pm.

This field based programme covers various aspects of Agriculture, Horticulture, Animal Husbandry, Dairy and Rural life of farmers.

Introducing the film during telecast

The versioning in Hindi

The process of versioning involved a systematic methodology. Hindi script was prepared by a professional, then the script was vetted by subject expert; voice over was done by professional, sub-titles were given in Hindi with minor editing/ mixing, then the final cut was previewed and reviewed for quality evaluation and the Hindi version was finalized. System used in India was PAL, Hi-Vision/ Standard and format of the master tape was DV-Cam/ HDV. The title of the series in Hindi is “Tiddhi Daud”.

Evaluation of the audience’s response

The evaluation of the programme was done through questionnaire survey.Direct feedback and interactive response was also the part of evaluation during interactive sessions of science communication programmes.Audience’s letters and e-mails were also taken into consideration.Community dissemination and appraisal poised some challenges and left behind interesting experiences, such as finding the suitable professionals who have the subject knowledge and media understanding was very difficult. Telecast schedules were also necessary to match with the timings of the Target audiences. Then the viewing and screening of the film were to be synchronizedwith the ongoing activities to achieve optimum results. Advance preparedness and developing rapport with the audiences was an advantage for better communication and retention. Mostly, the audience was part of the heterogeneous groups and many of them lack general awareness of the sub-

ject. Indecisiveness of the respondents was also a matter of concern and the organizers had to handle resistance at a few places and overcome it through interpersonal communication.

The series Hopper Race was telecast on Doordarshan

Table: Hopper Race (Tiddhi Daud) dissemination and evaluation in India

No.	Place	Date	Activity/ Event/ Number of audience	Comments e.g. target audience, audience response
1.	Telecast on National TV Network- "Doordarshan" (DD National), New Delhi	14.01.2014 & 13.03.2014	48 Million	Motivated for organic farming and judicious use of chemicals
2.	Viewed at Science Communication Workshops: a) Pratapgarh b) Ambedkar Nagar c) Tirichurapalli d) NCR Delhi Some 40 CD/ DVDs were distributed to participants/ ISWA Groups, etc.	 10.09.2013 01.10.2013 22.01.2014 10.03.2014	 100 150 200 50 40 Thousand	Film is motivational informative, interesting for farmers, public, scientists, industry, gives different perspectives, needs regional languages' versions
3.	On ISCOS website	Oct-Dec 2013	1.5 Million	Infotainment rich

Observations

The audiences comprised of farmers, village development officials, public representatives, scientists, journalists, communicators, etc.They liked the film with great enthusiasm and desired more detailed knowledge of the subject.Group previews were more effective than telecasts as they offered instant interaction where quarries were answered by the experts.However, the telecast has its own impact to reach the millions. Not only rural but urban population has shown interest to know more about ecological balance.They are motivated to avoid use of chemicals.The evaluation shows a positive impact of film. It also emerged during the course of the study that agrochemical advertising by the companies attract the farmers towards the chemicals, as the commercial segments of newspapers frequently publish advertisements of such chemical companies. News items related to new brands and chemicals, etc., have more coverage in mass media, probably due to robust public relations and media liaison by the companies. It has been observed that various companies organize publicity camps involving various stakeholders including farmers, bankers, village officers, etc., from time to time to promote chemical farming practices Common radio and TV broadcasts also carry such advertisements including hoardings on prominent places.

Film preview at Ambedkar Nagar

Some revelations and conclusions

It has been seen in different parts of the country that the colonies of honey bees are deviating or even dying where the chemicals are overused in crops.

Sulphas is a cause of accidents mainly in villages as it has been used as domestic insecticide for grain storage. Kidney diseases are simmering in developing world and such incidences were reported in considerable numbers in Shri Lanka. Therefore more concerted efforts are needed to curb the overuse of chemical pesticides and insecticides, etc. The viewing of versioned programme could continue to be part of our ongoing public outreach activities.The website may carry the links for long term usages. CDs/ DVDs can be replicated and distributed to schools, village committees, groups, etc., and further collaborations could be undertaken to widen the effort in the larger interest of the societies.Farmers' feedback and advice would be immensely important for sustained use of the video programmes under the science, health, agriculture, risk and environment (SHARE) communication programmes.

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What a signage! Proceed at own risk!

Traditional media for farmers' awareness to safeguard natural resources

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Agricultural knowledge is fast growing and doubling in every six years; however its transfer to the needy through appropriate media is lagging behind. The knowledge transfer seems to be the weakest link. Low literacy rate and inaccessibility of the modern agriculture knowledge can be overcome by traditional media. In the study it was found that there was significant increase in the knowledge in all categories of age and education level. The entire respondents from different professions gained the knowledge after watching the street play. It was found that there was significant increase in the knowledge of the respondents of all three locations. Majority of the respondents (52.0%) were aware about friendly insects and environmental implications (71.93%). It was found that 45.29% respondents were partially aware about different groups of pesticides.

India has made commendable progress in agriculture production after independence. The food grain production increased five times since independence, so as the population. More than 17 million people are added each year in India's population and more than one billion population requires 250 million tones of food. On the other hand a big gap is seen between the technology developed and adopted in the field. Mass communication using traditional media can play a vital role in farmers' awareness.

Communication strategies adopted often do not impact the rural masses as they are not contextualized to the local settings, cultural dialectics and view of the people. Although the rural masses are now able to access to modern mass media such as television, radio, film, newspapers, internet and e-mail in our country, the effect of folk and traditional media still remains relevant as it has high empathy, language compatibility and credibility. More exploration in indigenous communication theory should be encouraged to promote more productive and relevant communication research in our societies.

Even the poorest man in India has access to the traditional media, cultural media or folk media expressed in various forms such as story, poem, play, song, proverbs, drama, wall paintings, symbols, *kavad* and *pad*. Folk media for non-formal education programme is also popular in Malaysia, Niger, Thailand, Pakistan, Taiwan and China. In each cultural region of India, there are various traditional, folk and cultural media available, which include folk songs and dances as well. The folk media are based on the content of communication derived from the traditional beliefs and customs; but incorporation of modern scientific contents, they become more effective.

Dramatization is one of the methods that makes a special appeal to farmers as it reproduces reality of life. Dramatization depicts the characters through the use of language accompanied by facial expression, gesture and movement. Dramatization methods not only help in quick learning but also in better retention. The farmers learn through recreation and make use of their sense of hearing and seeing, which results in permanent learning.

Keeping in mind the embedded approach of scientific content and traditional media with cultural milieu of Punjab farmers, a United State India Education Foundation (USIEF) project was administered in Punjab State to analyze the impact of the traditional media to safeguard the natural resources.

Three special days were taken in Punjab state and street plays were organized under the USIEF project. Awareness exhibitions and guest lecturers were the part of the activity. Technical street plays

were staged in three different locations, i.e. Mansa, Moga and Hoshiarpur of Punjab state. The technical plays were based on the message of judiciously using the natural resources. Firstly, the knowledge test was administrated among farmers to judge their existing knowledge about the selected concept of environmental implications caused due to injudicious use of pesticides before entering the venue. The farmers were given a questionnaire for filling prior and after the folk performance. They were again requested to fill the back side of the same questionnaire with red ink pen (provided by volunteers). This formed the basis to see how far the respondents were able to gain the new knowledge provided passively through the folk performance.

It was found from the study carried that there was significant increase in knowledge in all the three Districts. Data in Table 1 reveals that in Moga district 13.99% of the respondents from total 150 respondents were aware regarding pollution caused by pesticides before exposure; and after visiting the exhibition and watching street play, total 21.98% of the respondent were found aware of the same. Similarly, in the case of Mansa district 22 (14.65%) respondents were aware before exposure; and 34 (22.64%) respondents were found aware after the exposure. It has been observed that before exposure total 67 (44.62%) of respondents were aware of the pollution of water bodies by pesticides; the number of aware respondents was increased to 96 (63.94%) after exposure. 105 respondents were aware after exposure regarding pesticides are lethal for friendly insects. Earlier this was known to 73 (48.62%) respondents. It has been observed that one third other respondents were aware about the change of the group of pesticides. This figure was significantly crossed mark of 50% (80). The knowledge of respondents was significantly increased in awareness regarding mixture of pesticides, seed treatment, friendly insects, economic threshold level, recommended varieties and surveillance of the fields.This can be easily seen in the Z value given against the statement which was significant at 0.05% level.

Table 1: Gain in knowledge level of farmers regarding environmental implications

No.	Exposure Statement	Moga		Mansa		Hoshiarpur		Total		Z value
		Before Score	After Score	Before Score	After Score	Before Score	After Score	Before Score	After Score	
1.	Pesticides pollute water bodies	21 (13.99%)	33 (21.98%)	22 (14.65%)	34 (22.64%)	24 (15.98%)	29 (19.31%)	67 (44.62%)	96 (63.94%)	3.361*
2.	Injudicious usage of pesticides affect environment	21 (13.99%)	31 (20.65%)	19 (12.65%)	31 (20.64%)	25 (16.6%)	33 (21.98%)	65 (43.3%)	95 (63.3%)	3.472*
3.	Injudicious usage of pesticides is lethal for friendly insects	24 (15.98%)	31 (20.65%)	23 (15.32%)	37 (24.64%)	26 (17.32%)	37 (24.64%)	73 (48.62%)	105 (69.9%)	3.761*
4.	The groups of pesticides should be changed frequently	14 (9.32%)	23 (15.32%)	11 (7.33%)	26 (17.32%)	17 (11.32%)	31 (20.65%)	32 (21.31%)	80 (53.3%)	5.729*
5.	Mixture of pesticides is not good	17 (11.32%)	29 (19.31%)	13 (8.66%)	27 (17.98%)	20 (13.3%)	36 (23.98%)	60 (39.10%)	92 (61.27%)	3.695*
6.	I know the process of treatment	22 (14.65%)	27 (17.98%)	20 (13.3%)	30 (19.10%)	22 (14.65%)	29 (19.31%)	64 (42.62%)	86 (57.28%)	2.540*
7.	Friendly insects are beneficial for us	17 (11.32%)	24 (15.98%)	17 (11.32%)	29 (19.31%)	19 (12.65%)	38 (25.31%)	53 (35.210%)	81 (53.95%)	3.252*
8.	Whether pesticides should be used according to economic threshold level	14 (9.3%)	18 (11.99%)	12 (7.99%)	29 (19.31%)	17 (11.32%)	29 (19.31%)	44 (29.30%)	76 (50.62%)	3.771*
9.	we should use the un-recommended varsities	20 (13.3%)	29 (19.31%)	21 (13.99%)	27 (17.98%)	23 (15.32%)	34 (22.64%)	64 (42.62%)	90 (59.9%)	3.003*
10.	The pesticides should be used after surveying the field	22 (14.65)	27 (17.98%)	21 (13.99%)	29 (19.31%)	23 (15.32%)	33 (21.98%)	66 (43.96%)	89 (59.27%)	2.657*

*Significant at 0.05 level

Table 2: Distribution of respondents based on their awareness related to environment

No.	Aspects	Aware (%)	Partially aware (%)	Not aware (%)
1.	Friendly insects	78 (52.0)	41 (27.36)	31 (20.0)
2.	Environmental implications	108 (71.93)	36 (23.98)	6 (3.89)
3.	Recommended group of pesticides to control Aphid/ Jassid	45 (29.97)	68 (45.29)	38 (25.11)

The data in Table 2 show the awareness of the respondents regarding different aspects related to environment. It has been observed that 52% respondents were aware about the friendly insects and can name one of them. 41% respondents were partially aware about the friendly insects and 20% were not aware about the friendly insects. Majority of the respondents 71.93% were aware of the environmental implication due to injudicious use of chemicals, while one forth of them were partially aware. Similarly, in case of recommended group of pesticides to control Aphid/ Jasid revealed that 45.29% were partially aware, whereas 29.97% were aware and can name the recommended group. One fourth of the respondents were not aware about the recommended group of the pesticides.

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Breaking the nuclear jargon into dialects

How to convert the technical language into common man's language

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Introduction

Communication is not a rocket science, but not less important either. In this highly competitive communication world, winning the hearts and minds of your target audience is a strenuous task. Today's common man is clogged with information. He is the ultimate target for every single science, technology and business institutions. Motor companies want him to know the better technology that their product by which they try to influence the buying decisions. Pharmaceutical companies try to explain their drugs' chemical combination to the people and want them to understand how enhanced is their drugs than others. Climate scientists want the common man to understand how mankind is making irreversible harm to the environment and urge us to lead an eco-friendly life. The rocket and satellite agencies want the people on the earth to know their extraordinary scientific feat.

Besides, it is needless to say how the makers of fast moving consumer goods are targeting the common man to increase the sales of their products and to make a good business.

Amidst these, communicating the public about nuclear power generation and making them understand about the science behind it is an eternal challenge.

It was a few years back, when I was a fresher in the nuclear industry, I told a reporter that the new reactor attained criticality last evening. Instantaneously, he asked me "how many workers are affected?". I was taken aback upon hearing this. He actually thought that criticality was something crucially urgent or something wrong happened. Something like, "a bus met with an accident and 15 people are affected".

The word "criticality" may be a common parlance of the nuclear community, but it surely is an alien term for the common men. When you say that "in the nuclear reactor the effective multiplication factor of neutrons that is the K_{eff} is equal to one which refers to the critical condition of the reactor", a layperson will certainly feel dizzy. Instead, tell him that "the continual splitting of the atom has begun in the nuclear reactor, and this process is called as criticality", you will get your point across.

Criticality, fission chain reaction, radiological emergency, and many more such technical jargons that revolve around in the nuclear industry actually make the public sick. Before communicating, a communicator who is into the nuclear familiarization needs to think in the way his audience thinks. He needs to match the frequency of a common man. Moreoever, the message is to be as much simple as possible and should be jargons-free.

There are ample ways to communicate about nuclear energy: One-to-one interaction, awareness lecture to a group, through mass media like print, radio and TV, use of social media, etc. We may have to use all of them to reach out different classes of our target group.

Post-Fukushima, public concerns about nuclear energy grew multifold and almost all the nuclear establishments in this world faced a fresh round of challenge. But some projects were badly affected. One of them was the Kudankulam Nuclear Power Project (KKNPP) of India's Nuclear Power Corporation. Public staged a prolonged protest against the usage of nuclear energy and KKNPP and as a consequence the project was stalled for about eight months even before the plant began its operation.

It was then realized that public communication is as much crucial as power generation. A special public outreach programme was set off and a dedi-

cated team of communicators was formed to address the concerns of public about nuclear power and to dispel their speculative apprehensions. It took so long to make the people aware of how nuclear power is generated and the complex technology behind it. Slowly, public confidence was built and they began to believe that nuclear power plant was not to harm the people and the environment but to benefit the humankind.

In about one decade of experience, the communication team of KKNPP evolved tailor-made communication methodologies to reach out to the desired audience effectively. Here are some ways to communicate the complex nuclear science to common men that yielded good results:

Interesting analogies

One of the frequently asked questions faced by the Indian nuclear community is when the nuclear power reactor is going to blast like a bomb? One can simply reply that the fuel in the nuclear power contains only a few percent of fissile material whereas the fuel in a nuclear bomb requires more than 90% of fissile content. Perhaps none of our target people might have seen a nuclear bomb or fuel of a nuclear power reactor. So, when we talk about the fissile content of the nuclear fuel, it is really hard to catch on. And you can't show them one, either. A hard task, really.

Yet, we can make them understand the difference of both by drawing inferences using analogies. A hard to understand technical stuff can be compared with simple objects that are familiar to the audience. For the above scientific explanation of nuclear fuels, I take match stick and fire cracker for comparison. Here is my analogy:

"Both the match stick and fire cracker are fire related things. All of us use them. But there are two major differences between them. One, the control. When you ignite a match stick you have a complete control over the action – you can lit a lamp or blow it off. On the contrary, the moment you ignite a cracker you lose control over the action – it may explode or otherwise, but the control is not your hands. Two, the kind and amount of chemicals. The amount of chemicals used in a fire cracker is several times more than that of the matchstick, and the kind of chemical used in fire cracker is superior. Same is the case with the fuel used in a nuclear power reactor and a nuclear bomb. In a nuclear power reactor, the process of splitting of atom is totally a controlled action, whereas in a nuclear bomb it is uncontrolled. Secondly, the fissionable content in the fuel of a nuclear power reactor is far less than that of the nuclear bomb.

Analogies help the people to comprehend with the unfamiliar technical subject by drawing inferences from the things that are already familiar with.

Seeing is believing

Human's imagination capability has limitations. It is difficult to make one visualize about something with verbal communication alone. If the matter is of science, especially the intricate nuclear science, it is even more difficult to secure the message in the minds of the audience. Instead of asking them to see things in their mind's eye, it is better to show them once. Because, seeing is beleving. That is why the "visit KKNPP" initiative has been started. People, students, policy makers, villagers and many other class of public are taken inside the Kudankulam Nuclear Power Plant and provide them a chance to glimpse at how nuclear power is produced. In this everyday ritual, people get first hand information about nuclear basics and get a chance to see the reactor building, turbine building and other auxiliary units. A briefing about nuclear power generation and the safety features followed by a field visit actually help the audience understand the concept easily. Certainly, it is an effective way of public understanding of nuclear science.

The telling testimonials

Nuclear power is environment friendly. True. But how many of them buy this idea really? When just statements are made, probably there won't be any takers of it. That is why, to substantiate the fact that in nuclear power generation no obnoxious gases are released, you need to have strong testimonials. At Nuclear Power Corporation of India, the voluntary Environment Stewardship Programme (ESP) renders testimonials on how nature and nuclear technology can go hand in hand. Through ESP, many scientific studies on birds, butterflies, plants and other forms of life are being done. From time

to time, the findings of these studies are published in the form of articles, booklets and photographic books. These reports are endorsed or technically vetted by respective experts in the field of natural history. Such reports strengthen the fact that nuclear power is environmentally benign. NPCIL has so far published four coffee-table books based on the studies of biodiversity in and around its sites, the recent being "Fliers of our courtyards – a book on some birds of Indian nuclear power plant sites".

Once there were only negative headlines about nuclear power and KKNPP in the local media. But due to the persistent and concentrated efforts, there came a turnaround in the way of reporting nuclear information. The biased news stories turned to be balanced ones. Today a reporter before publishing a story on nuclear does a fact checking with us. And these days many positive headlines on nuclear and KKNPP are appearing, too.

It is easy to create a brand image or to position a product. But, restoring the image of a brand or organization is quite challenging. Secondly, the technology is too complex to understand for a common man. Therefore, communication should be very simple, using a plain language preferably in the language of the receivers.

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Science through literature and social media

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Science and literature are two different poles apart. Any resemblance amongst them could be a matter of great coincidence. Literature is created because of creative imagination of a poet, author or artist. Whereas, science has a bearing that it persists on the facts. There is no limit for the imagination of a poet, just sitting on the unbridled horse of the ideas then moving around the world. Creation of literature through the understanding of science is the demand of today's time. A lack of scientific approach in literature is almost missing. The advent of new media has increased the number of readers and writers of literature and has expanded its reach the world over. Science and technology have played a very important role in the expansion of the literature as well. New media is so powerful means today for sharing and acquiring information. However, the presence of science in literature is negligible despite that fact that science has accelerated the flow of information through virtual information highways is credited to connecting the nooks and corners.

A look at the Hindi literature

It is evident from the antiquity that the Hindi literature is very rich in imagination as well as the real life situations. For example, Chandrabardai has exaggeratedly explained heroism of King Prithviraj Chauhan in the primitive heroic epic. Compositions equally were written on Nav Ras in both disciplines of Hindi literature. The high quality poems were created by Tulsidas, Raskhan, Bihari, Malik Muhammad Jaysi and so on. These legendry angles of creative wisdom have described both *Ras* (emotion), *Sanyog Shringar* and *Viyog Shringar* unprecedentedly. Devaki Nandan Khatri has given another dimension to Hindi literature by composition of fantasy novels, like Chandrakanta, Chandrakanta Santati, and Bhootnath (unfinished). Some scholars consider it as primitive form of science fiction in Hindi imbibes with a well-flavoured love story at the center, written somewhere in the year 1880.

Miraculous events and resulting curiosity in Chandrakanta progeny were quite different from traditional writings. Subsequently, there emerged reformist compositions in literature, which are realistic in keeping with the contemporary social settings. Bhartendu Harishchandra has established Saraswati around 1900 that paved the way for further advances towards the direction of science literature to some extent. Therefore, Bhartendu is called the creator of modern Hindi literature. If Bhartendu develops Hindi language, Acharya Mahabir Prasad Dwivedi has consecrated it. In addition, Munshi Premchand has developed such a tradition in Hindi novel that has guided the literature for the whole century and beyond, though science content was constantly missing!

The Hindi literature has passed through various stages and has seen various changes have taken place over the long journey so far. It has molded itself according to the time and circumstances. In the twelfth century at the time of its inception, as per the need of the hour these days, the poetry of heroic *Ras* was created. Thereafter, the thirteenth century has however seen a remarkable shift from *Ras* to the devotional creations so that people could be united. However, by the sixteenth century, the literature once again shrunk to the royal courts. In the latter half of the eighteenth century, literature enters into modern times. In the last two centuries, modern Hindi literature has been changed drastically.

Information technology and Hindi literature

After 1980, the Hindi literature entered into a new era of innovation and development supported by the upcoming Information Technology thereby changing the face of communication. The usage of computer and internet has grown rapidly and new forms

of writings emerged in the form of blog in Hindi. Many websites like: jankipul.com, hindinest.com emerged besides e-journals and e-books enriching the e-literature in Hindi.

As we have witnessed through the history, Hindi literature has always been a reflection of the contemporary society and its expectations. Free from the influence of Prakrit and Apbhransh, Khadi boli was created with the support from Brij and Awadhi dialects. Today, the time has come that the Hindi literature must embark on a new journey, where not only science, technology, and innovation can take the center stage but psychology, philosophy, social issues, and creative imagination also taken along.

Science fiction

Least in India but at large scale in the world, science fiction has been written. If look at the history of science fiction, the rudimentary efforts appear after the Britain's industrial revolution. From 1750 to 1850 period, undergone a drastic change in the world when man has recognized the power of machine and invention at large scale. The impact of science on life started becoming quite visible. On the one hand, where science was proving to be a boon to humanity, it was also raising doubt in the minds of the people that machines somewhere may leave man unemployed, on the other! Soon the dilemma gave birth to a unique genre of literature, the science fiction. The famous British poet Percy Bisi Shelley's wife Mary Wollstonecraft Shelley wrote "Frankenstein" or The Modern Prometheus which is a novel about a young science student Victor Frankenstein, who creates a grotesque but sentient creature in an unorthodox scientific experiment. Shelley started writing the story when she was eighteen, and the novel was published when the first edition was published anonymously in London in 1818, she was twenty. Shelley's name appeared on the second edition, published in France in 1823. Today the novel is known as the first modern science fiction that has highlighted possibilities of scientific advances in future.

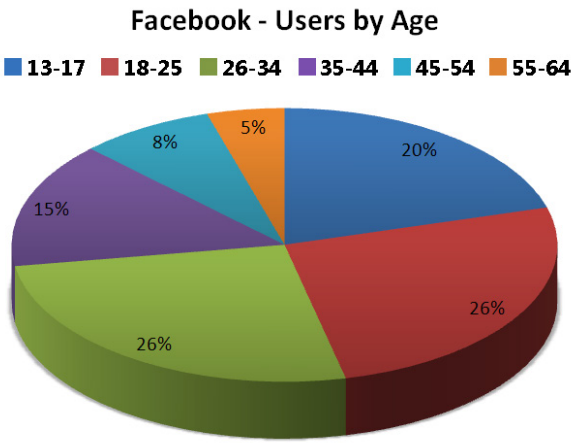
In India, most science stories were written in the latter half of the nineteenth century. Nevertheless, their number is very low. A science fiction "Ashcharya Vratant" in Hindi was written by Ambika Dutt Vyas in 1884, which was published in the form of a series in a magazine, *Piyush Prawah,* brought out from Vindhya Pradesh (Central India).

Science Films

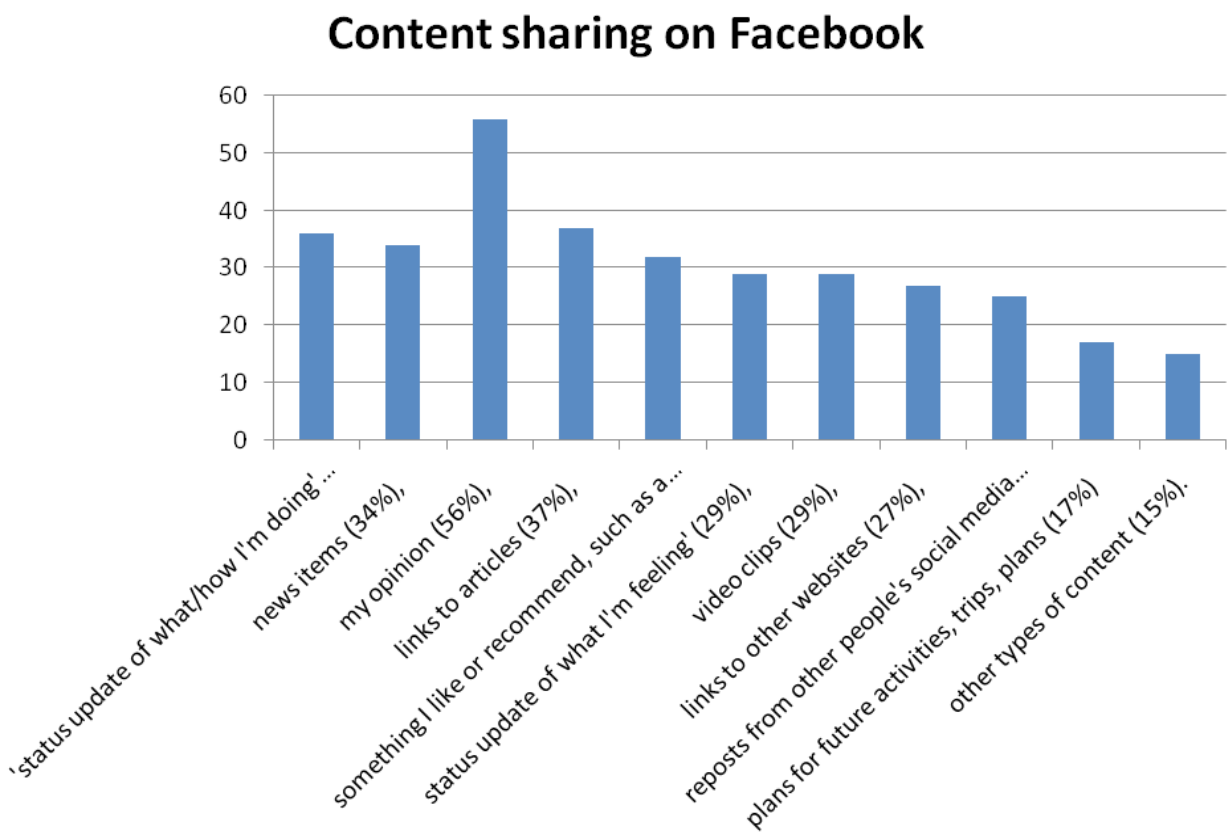
A myth in India, that there is no audience for science fiction, was proved baseless, when movies like, Alien, Jurassic Park, Avatar, Matrix, Star Wars, Superman, Spiderman and Time Machine, etc., rocked the silver screen. Many famous writers such as, Acharya Chatursen, Dr. Sampurnanand and Rahul Sankrityayn having created the genre of science fiction had been able to attract the attention of common man. Science fiction is not only read worldwide but the films which are based on it have become huge hits. Science fiction is preferred in Hollywood very much. "A Trip to the Moon" is considered to be the first science film.

India's first science fiction film was made in Tamil. Mr. X in Mumbai was the first film in Hindi based on science fiction. The film Alien was based on the script written by famous filmmaker Satyajit Ray. Not like Hollywood but Bollywood also produced some movies on science fantasy. Some of them are: Chand Par chadhai, Mr. India, Toofan, Aditya, 369, Pataal Ghar, Koi Mil Gaya, Krrish, Rudraksh, Kya Hhoga, Love Story 2050, Prince, Ra-one, Joker and Virus, etc. People generally are interested in science-related information in India, only such exciting software are generally lacking.

Science and social media



Social media is very popular among teenagers and youth, though only a few such media cater to this large cross section of the society. While the new generation holds the future of India, there is a need for creating a scientific approach amongst them. Facebook is one of the popular platforms of social



media through which one can convey viewpoint to many people. Statistics show that most people on Facebook reveal their views (56 percent). 37 percent people use Facebook for sharing their articles and status. 32 percent express their opinion about a movie, or a product, etc. Some 29 percent people explain what they are feeling now. 17 percent share their future plans. 29 per cent people share video clips and 27 percent share a link of a given website. Just 32 percent people share a news item. Although science-related information shared on Facebook has not any official figure, however, the author of this piece during her research found that the news items and websites shared by people especially related to science were minuscule. Twitter, however has also registered its wider reach especially amongst elite class. Social media could be a tool for science awareness primarily amongst them who are connected to social networks and secondarily to them who are in contact with the former. However, very little is being done towards it.

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The late bloomer psychology

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A late bloomer is a person whose talents or capabilities are not visible to others until later than usual. The term is used metaphorically to describe a child or adolescent who develops slower than others in their age group, but eventually catches up and in some cases overtakes their peers, or an adult whose talent or genius in a particular field only appears later in life than normal, in some cases only in old age. In most public educational systems, children and adolescents of the same age are put in the same classes. Because of the wide variance in the onset of adolescence, this means that one class may include individuals who have not yet started puberty, others who are sexually mature but not fully grown and yet others who are effectively adult. During this period, there is a high risk of an adolescent dropping out of formal education (due most commonly to laziness, intellectual boredom, bullying, or rebellion) without having achieved their full learning potential.The term "late-bloomer" may refer to such an individual who develops serious intellectual interests in their 20's or 30's and enrolls in college, where he or she performs particularly well and subsequently establishes a professional career. A late blooming adult is a person who does not discover their talents and abilities until later than normally expected. In certain cases retirement may lead to this discovery(1).

Late bloomer: General observations

- The term 'late bloomer' is used metaphorically to describe a child or adolescent who develops more slowly than others in their age group, but eventually catches up.
- In some cases the individual overtakes their peers.

When used in the context of an adult, it refers to a talent or genius (in a particular field) which only appears later in life than normal.
May be associated with deep thinking - with a tendency to making better decisions with fewer mistakes.

Psychological style of 'Experimental Innovator' - people who go through "a lifetime of trial & error & thus do their important work much later in their careers."

Different types

- Career Late Bloomer
- Educational Late Bloomer
- Social Late Bloomer

Although there is a common perception that intellectual development peaks in a young adult and then slowly declines with increasing age, this may be simplistic. Although the ability to form new memories and concepts may indeed diminish, the older person has the advantage of accumulated knowledge, associations between concepts, and mental techniques that may give them an advantage in some fields (1).

When a child falls behind their peers at some stage of development, their teacher may perceive that the child is "backward". There is strong evidence that this perception may become self-fulfilling: although the child catches up, the teacher may

continue to rate their performance poorly, imposing a long-term handicap. Thomas Edison's mind often wandered and his teacher was overheard calling him "addled." This ended Edison's three months of official schooling. His mother then home schooled him. Edison may have had some form of Attention-deficit hyperactivity disorder (ADHD), which is said to affect about 3 – 5% of children.

A notable example of a child who overcame early developmental problems is Albert Einstein, who suffered from speech difficulties as a young child. Other late-talking children who became highly successful engineers, mathematicians and scientists include the physicists Richard Feynman and Edward Teller. Neuro-scientist Steven Pinker postulates that a certain form of language delay may in fact be associated with exceptional and innate analytical prowess in some individuals.

Dyslexia is a learning disability that may affect 3% – 10% of children. It is thought to be the result of a genetically inherited neurological difference from "normal" children, and has been diagnosed in people of all levels of intelligence.Studies indicate that 20% to 35% of U.S. and British entrepreneurs have the condition: by definition, late bloomers. Researchers theorise that dyslexic entrepreneurs may attain success by delegating responsibilities and excelling at verbal communication. Richard Branson, known for his Virgin brand of over 360 companies is a notable example, as is Charles R. Schwab the founder and CEO of the Charles Schwab Corporation. Pablo Picasso, Tom Cruise and Whoopi Goldberg are other examples of dyslexics, considered "slow" as children(2).

The autism spectrum of psychological conditions affects about 0.6% of children, characterized by widespread abnormalities of social interactions and communication, severely restricted interests and highly repetitive behavior. Notable individuals with autism spectrum disorders include Tim Page, a Pulitzer Prize-winning critic and author and Vernon L. Smith, a Nobel Laureate in economics.

Late bloomers comprise approximately 10 percent of 17 to 19 year olds who say that they have had no experience with romantic relationships. The three characteristics shared by these "late-bloomers"—individuals who were still showing maladaptive patterns in emerging adulthood but had gotten their lives together by the time they were in the late twenties and early thirties—were being planful, showing positive aspects of autonomy, and support by adults.

"Late bloomer..." We use this term to describe someone who reaches peak cognitive function in late adolescence or early adulthood. Not surprisingly, many of these later-developing traits are frequently seen in children with many of the most common 2e patterns: AD/HD, dyslexia, autism spectrum disorders, and sensory processing disorder. There is also evidence that giftedness (or high IQ) is itself correlated with delays in development of certain functions. In a study from Port Townsend (Reina et al. 2006) researchers found that the higher the IQ, the greater the likelihood of high discrepancies between two types of IQ subtest scores: verbal IQ scores (VIQ) and performance IQ scores (PIQ). When researchers compared the VIQ and PIQ scores, they found that 17 percent of a control sample had discrepancies of 18 points or more. In the gifted sample, however, a much higher percentage — 55 percent — showed this level of discrepancy. Furthermore, another study showed that higher IQ in young children correlated with slower development of prefrontal cortical thickness (2).

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Krishi Kavi Gosthi (Agriculture Poets' Meet): Communicating agriculture through poetry

Rakesh Dubey (Delhi), Chandra Prakash Patsariya (Datia), Vijay Kishore Manav (Ghaziabad), Kunwar Bechain (Delhi), Dr. Kirti Kale (Compere), Anubhuti Chatturvedi (Delhi), Dr. Laxmi Shanker Bajpai (Delhi), Sunil Jain (Gwalior), Prof. Dinesh Mani (Allahabad)

Poetry has been a popular form of mass communication, especially when it comes to communicating to illiterate, neo-literate, lay persons and farmers, etc. Ghagh - Bhaddari, for instance, had created a number of rhymes to educate people about the changing weathers. These rhymes are still relevant even in the age of data analytics and mathematical modelling for weather forecasting. Similarly, these rhymes are applicable not only on sowing and other agricultural practices but for social customs and cultural practices as well.

Recognizing the potential of poetic genre of communication for agricultural sciences and farming practices, a Krishi Kavi Gosthi was organised on the occasion of Basant Panchami, I.e. 12 February 2016 by DD Kisan Channel at the studios of te Central Production Centre, Doordarshan, Khel Gaon, New Delhi, which was very well attended by the invited farmers, scientists, experts, and staff members of CPC, Doordarshan, etc.

The poets' meet at its peak!

The programme was able to attract a variety of distinguished poets who have an agriculture background and a flare in poetry. Dr. Shiv Gopal Mishra, Former Director, Sheeladhar Institute of Soil Sciences, Allahabad University was the chief guest on the occasion, who is a prolific popular science writer and creator of an encyclopedic series Bharat Ki Sampada (The Wealth of India). Noted poet, Kunwar Bechain was amongst the leading poets and spread the fragrance of his spectacular poetry all around.

Bagaryo Basant Hai!

Science meets poetry!

Sunil Jain from Yuva Vigyan Parishad, Gwalior doinated the floor with his very impactful satirical rhymes. Chandra Prakash Patsariya from Datiya (MP) was able to arouse the audience by his interesting agriculture poems, as he carries with him the unique ability of creativity driven explanatory aspects of complex scientific concepts in simple language! Noted journalist and poet Vijay Kishore "Manav", Former Feature Editor, Hindustan, has narrated the touching story of villages through his captivating poems.

Prof. Dinesh Mani from Allahabad University has effectively communicated the science of precipitation through his memorable science poetry. Dr. Laxmi Shanker Bajpai, Deputy Director General, All India Radio recited a poem on the occasion of Basant Panchmi and painted a vivid scenario of spring season through his evergreen poems. Anubhuti Chaturvedi from Pallavi Arts has added colours to the programme through her inspiring poems, whereas Richa Banerjee, Director, All India Radio depicted the hardships of rural life in her recitation.

Dr. Manoj Kumar Patairiya recites a science poem

Dr. Kirti Kale - The master soul of the meet

The audience enjoying the nuances of agriculture poetry

Well known poetess Dr. Kirti Kale conducted the programme with her very lively poetic interventions; Dr Kirti also recited her own poems in exciting and effective manner. The whole atmosphere was filled with numerous shades of colours and fragrances to really enjoy the true spirit of spring and welcome the Basant!

Dr. Manoj Kumar Patairiya, Additional Director General, Doordarshan and Head, DD Kisan Channel, welcomed the guests and the audience and recited a poem to warm up the Krishi Kavi Gosthi. It was also the occasion of presentation of the awards for the winners of various competitions organized in connection with Raj Bhasha in the preceding year.

Group Captain Job Mathew, Deputy Director General, CPC; Sanjay Kumar Sethi, Deputy Director General, Engineering; Kishore Maliviya, Content Head, were also present on the occasion and gave away the awards.

Rakesh Puri, Hindi Officer and Akhilesh Mishra, Programme Executive, have coordinated the programme. The edited version of the programme was telecast on DD Kisan Channel. The programme was well received and appreciated by one and all especially in terms of its innovative approach and and timeliness.

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Dr. Patairiya honours the Chief Guest Prof. Shiv Gopal Mishra

Dr. Patairiya presents Rajbhasha Awards to winners from CPC, Doordarshan

To our Readers

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

Prasar Bharti programmers and engineers promote innovation

Prasar Bharti CEO Jawhar Sircar delivers orientation lecture

After a long gap of around 20 years, Prasar Bharti, India's Public Service Broadcaster, with its two arms - Akashvani and Doordarshan, has recruited new Programme Executives (PEX), induction programme, a series of orientation programmes was organized across the country to get them acquainted with current tasks and responsibilities, as well as familiarize them with the glorious past of legendary All India Radio and golden era of Doordarshan.

The introductory programme was organized at NASC Complex, Pusa, New Delhi with participation of some 200 new recruits during 11-13 June 2015. Prasar Bharti CEO Jawhar Sircar delivered the Orientation Lecture and expressed his happiness as new era of Prasar Bharti was taking off. He appreciated the systematic efforts put in for successfully organizing the programme. Prasar Bharti's new officers are expected to promote innovation and infuse creativity, said Sircar.

Member (Personnel) Suresh Chandra Panda in his inspiring address said that the newcomers must be full of enthusiasm, knowledge and expectations, but they need to dedicate themselves for the growth of the organization where ever they are working and always try to explore off the beaten tracks to succeed! Noted media personality NASSCOM Chairman and Former Discovery Channel Chief Kiran Karnik gave the keynote address on the occasion and aroused the young officers by sharing vivid experiences and elaborating on enormous opportunities and potential available around for them to look forward and excel.

The participants had a chance to visit All India Radio and Doordarshan on 12th June. They were divided in two batches to facilitate their respective visits in the forenoon and afternoon. All arrangements were made for the successful conduct of the orien-

AIR ADG Dr. Manoj Kumar Patairiya welcomes Prasar Bharti Member (Personnel) S.C. Panda

tation progamme. The engineering and programme experts offered detailed information to familiarize the newcomers about the types of equipments, studios, functioning, facilities, etc., of AIR and Doordarshan. A joint interaction programme with the Director General Doordarshan Mr. Lalrosanga, Director General Akashvani Mr. F. Sheheryar, including Engineers-in-Chief Mr. B. Chakrabarty and Mr. KBS Maurya was also arranged at the venue.

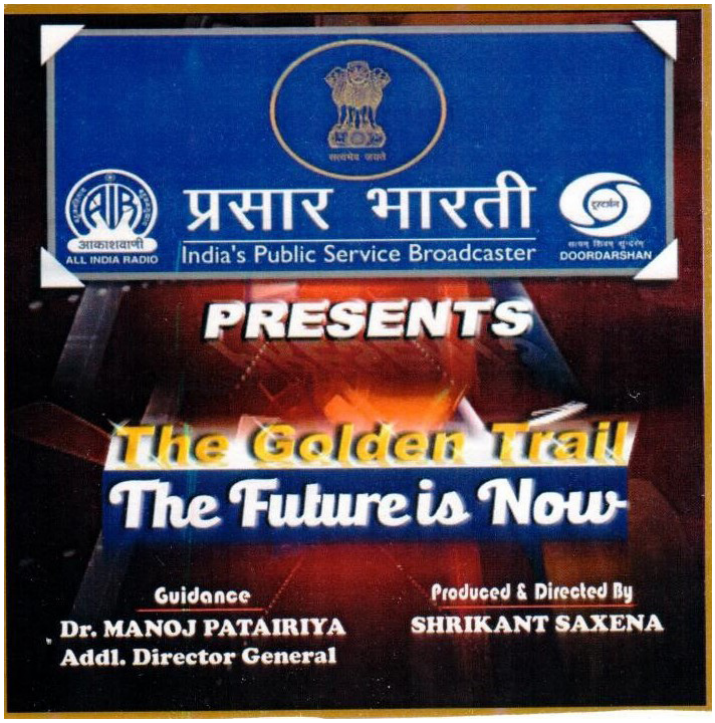
AIR DDG Rajeev Kumar Shukla welcomes Prasar Bharti Member (Finance) Rajeev Singh

CEO Prasar Bharati addressed the new recruits and given Orientation Lectures for new recruits in Delhi, Ahmedabad, Hyderabad, Kolkata and Bhopal and mainly covered the following aspects: What was AIR's contribution to nation building; What was DD's contribution to nation building; How PB was created; No recruitment was allowed for 20 years; What this new recruitment meant to us; The technological challenges of obsolescence that we have now got out of; Why do we need future oriented technology of FM and DTT; Who can help us in Social Media; Who can help us with Sales and Marketing; How fresh minds deal with archaic procedures and mind sets; The contributions of Programme Service so far and how the new recruits can help improve matters, etc.

An Orientation Training Programme for new recruits was organized in Bhopal during 31 July-1 August 2015, addressed by Jawhar Sircar, Chief Executive Officer, Prasar Bharati. S.C. Panda, Member (P), Prasar Bharti spoke on the topic "Prasar Bharati: Mandate, Structure and Functioning". The documentary on Prasar Bharati was screened. The keynote address was given by Dr. B.K. Kuthiala, Vice Chancellor, Makhanlal Chaturvrdi National University of Journalism & Communication. An interesting Question Answer Session was conducted by Deepa Chandra, ADG (P), DD, N.P. Joshi, Director (Admn), AIR; Sethumadhavan, Director (E), DD, and Sudarshan Ansolia, DD (E), AIR. The orientation programmes were also organized in Jaipur during 25-26 August 2015; and in Chandigarh during 2-3 September 2015.

Prasar Bharti Principal Adviser (P&A) Wing Com. VAM Hussain, NASSCOM Chair Kiran Karnik, PB Member (P) S.C. Panda

A special documentary was created innovatively on this occasion under the title: "The Golden Trail: The Future is Now". The overall impact of the programme was given by incorporating the original voice of Shyama Prasad Mukherjee, Sardar Vallabh Bhai Patel, Jawahar Lal Nehru, and Astronaut Rakesh Sharma from space. The script was written by expert and a brief dramatic segment was also added to make it more lively. The final structure of the documentary has a variety of content and a captivating connect with the target audience. The DVD film has statements of Prasar Bharti Chairman, CEO, Members, DGs to have authentic information and versions. Some bytes of new recruits were also placed at suitable places to share their feelings of joining Prasar Bharti and struggle they faced in getting an exciting career like Akashvani and Doordarshan. Couple of experts' bytes such as BBC India's Mark Tulle, Newsreader Shammi Narang, Sadhna Srivastava, and others added value and colours to the film.



The DVD familiarizes new recruits with great saga of Akashvani, Doordarshan, and Prasar Bharti

A coordination meeting at the venue, i.e. National Agricultural Science Complex (NASC) was organized 5th June 2015 chaired by Brig (Retd) VAM Hussain and attended by Dr. Manoj Kumar Patairiya, ADG (P), AIR, I.I. George, ADG(E), Rashmi Pradhan, DDG(P), Aditya Chaturvedi, Director (Projects), Dr. R.K. Nagpal, ASD (Music), Jatinder Kumar, PBS, Pratap Singh, PBS, Shirley Jacob, PBS, and Dr. S.K. Sharma, Security Officer, prior the first orientation programme. Wide media coverage of the event both in electronic and print media was carried out. Dr. Manoj Kumar Patairiya was given the responsibility of overall coordination of the countrywide orientation programmes and production of the Prasar Bharti documentary film for new recruits.

This recruitment has taken place after almost two decades and is a part of Prasar Bharati's efforts to rejuvenate AIR and Doordarshan by infusing fresh blood and talent to bring in innovation and creativity in all aspects of the promising organization especially in terms of technology modernization and programme quality advancement.

[Report by: Mr. Daljeet Sachdeva, DDG (Programme), Directorate General, All India Radio, Akashvani Bhavan, Parliament Street, New Delhi-110001]

The 16th Indian Science Communication Congress (ISCC-2016)

Organised by:
Indian Science Writers' Association (ISWA)
Indian Science Communication Society (ISCOS)
Regional Science City, Lucknow
Department of Anthropology,
Lucknow University

Venue: Lucknow
December 12-13, 2016

Main Theme:

The focal theme of ISCC-2016 is "Science Model: Excitement of Doing Science".

ISCC Format:

The scientific sessions will have presentation of contributory research papers, review papers, survey analyses, case studies, posters, and invited talks. Discussions in split groups would offer close exchange of thoughts and ideas. Deliberations will be in English and/ or in Hindi. The prescribed time for paper presentation will be around 10 minutes (7 minute for presentation + 3 minute for discussion). Power Point presentation facility will be available. Best paper awards would be given in junior and senior categories. Selected papers can be published in ***Indian Journal of Science Communication*** <www.iscos.org>.

Who can participate?

Some 200 researchers and practitioners of science communication, i.e. scientists, technologists, academicians, writers, journalists, editors, scholars and faculty members, public relations and information officers of scientific organizations, representatives of media, science activists from NGOs, and senior government officials/ public representatives, policy-makers, decision makers from India and abroad are likely to participate.

Special Features:

A display of science communication products, software materials, a special session for young researchers and students, face-to-face interaction with experts, open forums and debates on current issues under the focal theme, cultural programme, and field visit will be some of the attractions of ISCC-2016.

Abstract/ Paper/ Poster:

Last Date for Submission of Abstract (500 Words): December 10, 2016
Intimation of Acceptance of Abstract: December 10, 2016
Last Date for Submission of Full Paper/ Poster: December 10, 2016

Registration Fee:

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Last Date for Registration: December 10, 2016
Spot Registration is possible depending upon space availability and presentation quality.

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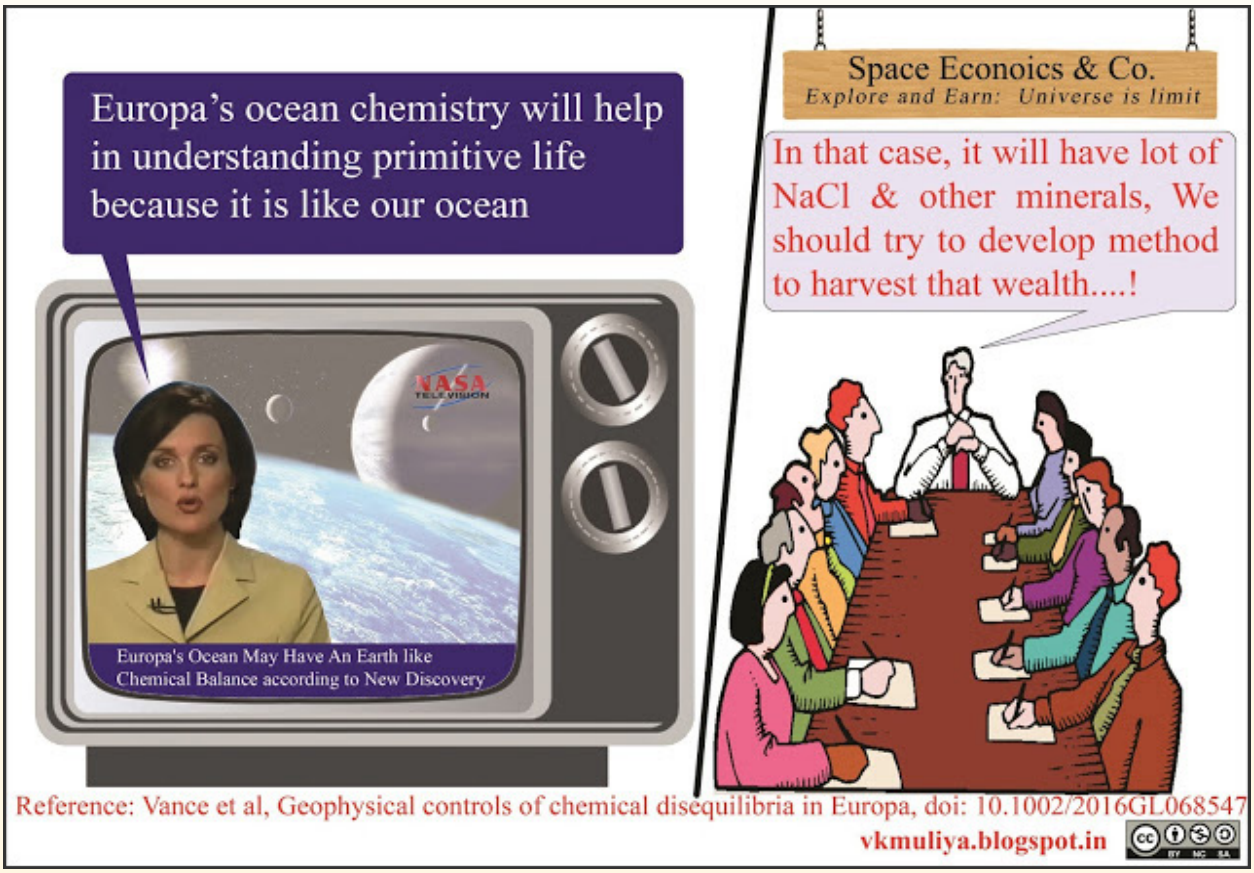

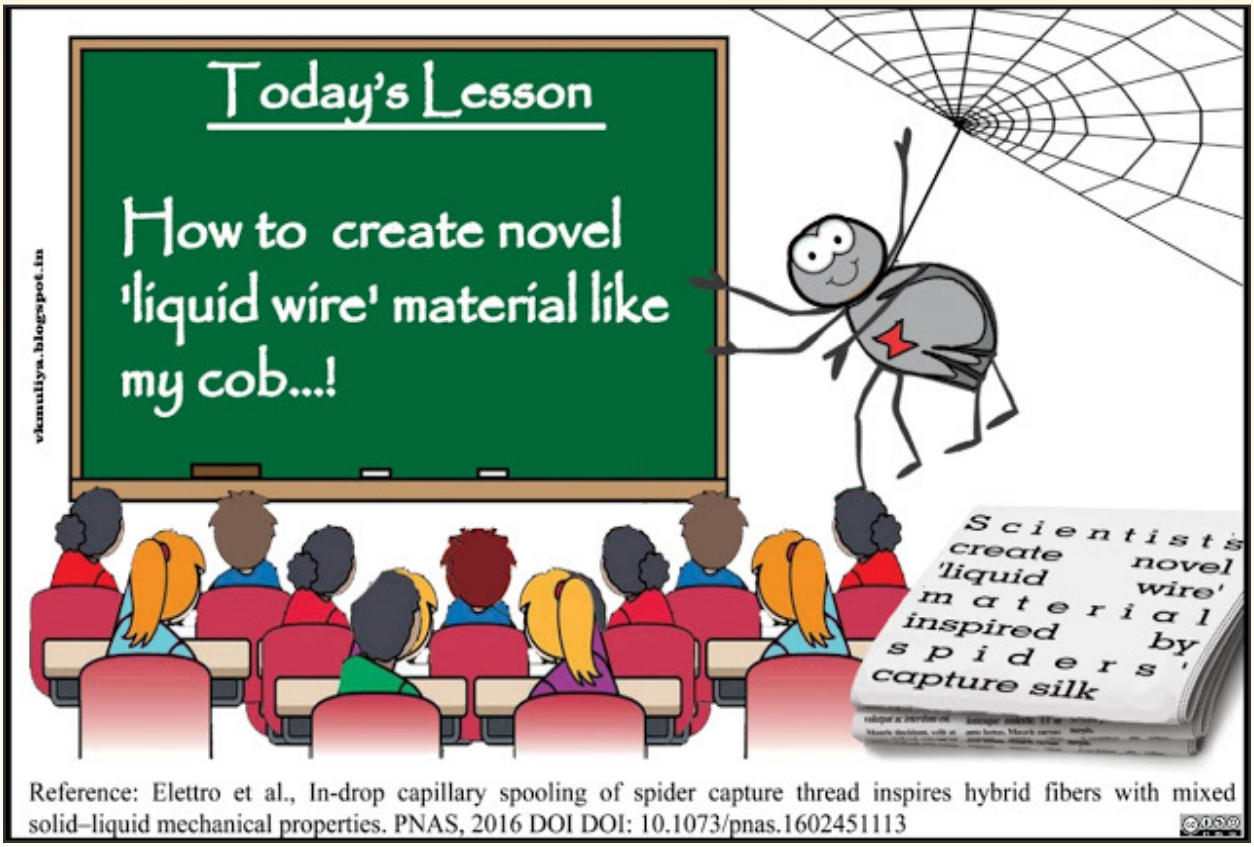

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