

***SCIENCE COMMUNICATION THROUGH CULTURAL EVENTS :  
A SUCCESS STORY FROM INDIA***

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**ABSTRACT**

India possesses a great treasure of cultural heritage in the form of her traditional rituals, festivals and socio-recreational activities, including mass involvement of people during such festivals. It was observed that people in far flung villages are still accustomed to age old practices and traditions and have a number of beliefs and miss-beliefs, which are the main constraints to their development. This unscientific attitude is considered to be one of the important root causes of most of the miseries of the people. The author has always been exploring ways and means to penetrate deeper into the socio-cultural fabric of the society to establish and strengthen the process of communication between the scientific community and the people at large, bringing them to the main stream of development. In the process, it was discovered that if the scientific contents and concepts can be weaved with cultural fabric of society, the process of science communication could become more effective and appreciable. Recently, the intervention of a well conceptualized, formulated, planned, implemented and coordinated programme, i.e. 'Science Communication through Cultural Events', has been able to trigger interest and curiosity, especially amongst rural folk and has started making a difference. The public attitude is changing; now they tend to be more analytical and rational in their approach and behaviour; they now rush to take anti-venom injection, in case of snakebite as a contrast to earlier days when they used to consult so called god-man for such remedies. These are some of the clearly visible indicators of changes over the period; only one programme cannot be credited for this entire success, it is a result of collective efforts of a number of science communication programmes by various organizations and individuals. The current programme, however, has been able to attract a large cross section of the society and motivate it towards a scientific culture. This is beginning of the end of age old superstitions and ignorance though several miles are yet to go.

**INDEX TERMS**

Science and culture, Science communication, Folk media, Tableau exhibits, Science procession, Rural communities.

## **INTRODUCTION**

Science and technology have made several strides the world over. India has also witnessed a quantum leap in the area of scientific and technological developments. In spite of the rapid scientific and technical developments taken place in recent years, there has been not much change in the conceptual outlook of the people. Old faiths and beliefs, based on non-scientific prejudices and habits, persist and dominate scientific thinking. This is one of the reasons for a contemporary society, with so many occult and paranormal notions that many people being misguided by so-called god men, claiming to possess supernatural power.

Realizing the potential of the cultural medium for science communication, a series of workshops on science popularization through cultural events are being organized in the country. Eventually, the programme could be taken to district and local levels to spread scientific awareness through cultural events. Communicating science through cultural occasions such as Durga Pooja, Ramlila, Prabhat Pheri seems to be an effective approach.

The Indian society has a tradition of folk media that has the potential to motivate and revolutionize the human psyche, such as fair, exhibition, play, tableau, and processions, etc. These programmes have been instrumental in not only providing entertainment, education and information but also inspiring people with the ideals of life. The present programme has the following objectives:

- A) To inculcate interest in science amongst artisans, folk artistes in particular and common man in general.
- B) To promote scientific awareness in the society for social up-liftment.
- C) To bring about a scientific culture at large so that science becomes part of culture.

## **SCIENCE COMMUNICATION PROCESS**

Prior to introduction of a coordinated programme on science communication through the cultural medium, a number of programmes were being tried and science communication processes adopted. Some important ones are discussed here :

- A) Scientific Explanation of So-called Miracles :  
“Miracle” is a phenomenon or an activity which seems unexplainable by the laws of nature and that is why it is supposed to be supernatural in origin or ascribed to an act of god”. Many of us might have seen ‘miracles’ being performed. The so called god men or avatars produce anything from nothing or transform one kind of thing to other, through what they call as mental power. They perform acts, which seem to be dangerous and exciting (like eating fire, walking on fire, Samadhi, etc.). To a common man, scientific explanations of many of these acts are now available. All of these miracles can be explained and are based on scientific principles. To find explanations to most of the miracles performed by the god men, we may categorise them as follows: i) Sleight of hands; ii) Use of mechanical apparatus; iii) illusions of body; and iv) Chemical reactions.

Awareness of scientific facts behind such miracles among people not only increases the level of confidence but also inculcates scientific temper and saves them from being cheated by the so called miracle man or god man. A demonstration kit has been developed with support from NCSTC for wider dissemination. Some 150 most prevalent miracles/ tricks have been compiled from across the country which can be demonstrated with the use of kit. A number of voluntary groups have been trained to first perform the miracles before people and then offer its scientific explanation so that the audiences are able to understand that there was no miracle as such, but a scientific phenomenon or trick and they can also perform these so-called miracles by using some specific materials. The activity has got tremendous response across the country. A book titled "Seeing is not Always Believing" was also published containing many miracles with their explanations and tricks.

B) Milk Miracle :

On the event of the so called milk miracle on September 21, 1995, when idols of gods and goddesses in temples and homes had started drinking milk, the author took initiative and organized a team of scientists to deal with and to investigate the situation. Visited different temples in the capital and observed that there was nothing, but only an illusion. The results were reported on Doordarshan's noon, evening and night news bulletins, wherein he demonstrated the phenomenon and gave scientific explanation of the event. The impact of this spontaneous exercise was so effective that the whole show declined immediately after the scientific explanation appeared in the media. A press release explaining the event was also issued.

C) Use of Folk Media :

It includes various performing arts, such as puppetry, theater, skits, street play, folk dances, folk songs; and drama, etc. These media are being used for science popularization in concerted manner to reach to unreachable because of its nature of two-way communication, cost effectiveness and ability to offer communication even amongst illiterates.

D) Folk Toys/ Games :

Under a novel effort, a number of traditional games and toys have been collected from various parts of the country that have some scientific principle or concept. These games and toys are being used for popularizing not only science behind them but also other related topics especially among children.

E) Science Communication through Cultural Events : The programme is divided into 4 parts, i.e., i) conceptualization of exhibits, ii) developing exhibits, iii) developing scripts for explaining exhibits, iv) demonstration of models/ exhibits in Pooja Mandap (Place of worship) and Pooja Yatra. The technical programme starts with an introductory session, wherein topics are assigned to groups of participants for developing exhibits on various subjects of science and technology as per their areas of interest.

That apart, many types of exhibits and models of clay, thermocol, wood, and cloth, etc., are also selected. The participants to this programme are drawn from universities, local/ regional schools/ colleges, and voluntary (scientific, social and cultural) organizations. Some 40 participants work in 8 groups and develop exhibits, of which some are selected for demonstration in the Durga Pooja Mandap and Pooja Yatra.

Participants also develop scripts, charts, and slogans for making demonstration of exhibits more effective. Apart from experts, four professional idol makers are also invited to give a professional finish and shape to the exhibits. They work with participants under the guidance of resource persons and extend their help in making the exhibits presentable. The material required for making exhibits is provided to each group of participants by the organizers. On the last day, an exhibition of the newly developed exhibits is arranged. This unique event attracts a large number of visitors. The exhibits are then demonstrated in Pooja Mandap and Pooja Yatra during various cultural events. The people are generally charged with excitement of such an interesting intrusion of scientific objects in the Pooja Yatra (religious march) and Pooja Mandap. The confluence of lively science exhibits and festive idols generates a lot of interest among common people. Though, the programme is a welcome effort at large, some time experiences a bit resistance from certain quarters, which is amicably overcome. A number of organizations are coming forward for organizing similar kind of experiments in different parts of the country. Improvisation is encouraged to make the programme more receptive and effective among masses.

The scientific topics covered in the programme were as follows :

- A. Cloning : The gene mutation depicted the elimination of a fictitious gene responsible for sins, as a mythological story.
- B. Biotechnology : The biotech tree depicted the potential of biotechnology.
- C. Internet : Various parts of internet were displayed.
- D. A forestation : This exhibit demonstrated the role of forests in human life.
- E. Solar cooker : Use of non conventional energy sources.
- F. Water harvesting : Traditional techniques of rain water harvesting.
- G. Fly ash : Use of fly ash in bricks making.
- H. General cleanliness : It is required for healthy life.
- I. Rational use of pesticides : Promoting bio-pesticides instead of chemical pesticides.
- J. Bio diesel : Jatropha plat can be used for production of bio diesel.
- K. No oxtocine : It is harmful to use oxtocin injection for over milking in cattle.
- L. Tsunami : Awareness and preservation of natural mangroves is the key.
- M. Herbal treatment : Use of various herbs and medicinal plants for good health.
- N. My village : A glimpse of high tech village.

## EVALUATION

The programme was assessed for its efficacy and impact. It emerged that the programme could attract a number of illiterate and rural people who generally do not find opportunity or have never been given the chance to know about science and technology confronting their day-to-day life. Majority of visitors was a firm believer of superstitions and supernatural powers; after having participated in science-religious processions under this programme, they have started believing scientific principles. In order to evaluate the programme, a questionnaire survey was conducted and questions were asked from the participants of the workshops as well as visitors/ beneficiaries of the programmed. The sample size was 500.

1. How you got information of the programme?
  - a) News paper
  - b) Radio
  - c) Television
  - d) Circular
  - e) Personal contact
  
2. After participating in the programme what is your level of beliefs/mis-beliefs?
  - a) Do not believe
  - b) Moderately believe
  - c) Somewhat believe
  - d) Often believe
  - e) Firmly believe
  
3. What was your level your beliefs/mis-beliefs before participating in the programme?
  - a) Do not believe
  - b) Moderately believe
  - c) Somewhat believe
  - d) Often believe
  - e) Firmly believe
  
4. Which form of communication is more effective for you?
  - a) Print
  - b) Broadcast (Radio/Television)
  - c) Digital (New media)
  - d) Folk/cultural/traditional
  - e) Public relations/inter personal/man to man contact/interactive
  
5. Do you think you are convinced to help spread further the spirit of science?
  - a) Not convinced
  - b) Moderately convinced
  - c) Some what convinced
  - d) Would depend on situation

- e) Fully convinced
6. Your educational background?
- a) Illiterate
  - b) Neo-literate
  - c) Up to 10<sup>th</sup> standard
  - d) Intermediate/Graduate
  - e) Post graduate and above
7. You belong to
- a) Small Settlement
  - b) Village
  - c) Town
  - d) City
  - e) Metropolitan
8. In case you come across so called miracle/superstition, what would be your reaction?
- a) Overlook
  - b) Moderately oppose
  - c) Try to demystify
  - d) Strongly oppose
  - e) Motivate people
9. Have you yourself ever experienced any miracle?
- a) Yes
  - b) No
  - c) My friend/relative neighbour has experienced
  - d) Came to know from media
  - e) Heard from somebody
10. Which scientific subject was more useful?
- a) General science
  - b) Biological/medical science
  - c) Earth/physical science
  - d) Agricultural science
  - e) Environmental science
1. The majority of participants got the information of the programme through personal contact (76%), followed by newspapers (12%), circular (7%), TV (3%), Radio (2%).
2. After participating in the programme the majority of people accepted that they moderately believe (62%), often believe (19%), somewhat believe (10%), firmly believe (8%), and do not believe (2%).

3. On a question of the level of beliefs/mis-beliefs before participating, the responses were very interesting: Firmly believe (18%), often believe (14%), somewhat believe (15%), moderately believe (52%), do not believe (1%).
4. Most of the respondents found the print media more effective (35.29%), followed by broadcast media (34.12%), folk media (19.32%), digital (02.02%) and interactive (09.25%).
5. Generally participants were somewhat convinced with scientific outlook (42%), followed by moderately convinced (31%), depend on situation (21%), fully convinced (4%), and not convinced (2%).
6. Most of the visitors were illiterate (37%), 10<sup>th</sup> standard (30%), Inter/graduate (19%), postgraduate and above (9%) and neo-literate (5%).
7. Presence from town area was high (56%) followed by villages (28%), small settlement (11%), city (3%) and metropolitan (2%).
8. While asking for their reaction to a miracle in future, the majority opted to motivate people against superstition (66%), try to demystify (22%), moderately oppose (7%), strongly oppose (9%), and overlook (3%).
9. Most of the people have no first hand experience of a miracle (43%), heard from someone (39%), media (15%), friend has experienced (2%), self experienced (1%).
10. On a question of the interest in various scientific subjects the majority of respondents liked biological/medical sciences (32.30%), general science (21.49%), agricultural science (17.78%), environmental science (15.17%), earth/physical science (13.26%).

A parallel study on beliefs and mis-beliefs about some 20 customs and superstitions prevalent in India has revealed interesting results :

1. 31% respondents believe in supernatural (up-shakun); 25% do not believe, 44% occasionally believe.
2. 25% respondents take it as good indication if an unmarried girl, cow or a married lady with a pitcher (filled with water) comes across while you are going for an important work.
3. 25% take it as a bad indication if a widow comes across, 33% when a cat crosses the road, 13% when they see an empty pot and 38% for sneezing.
4. 25% believe that it is good to keep your door open in the evening, no sweeping in the evening, any sweepstake standing, Nazar.
5. No hair cut on Tuesday, horoscope, numerology 38%.
6. 31% believe that no nail cut on Thursday, mantras for healing.
7. 44% believe that no iron to be purchased on Saturday, they believe in palmistry and zodiac.
8. 19% feel that the presence of owl in your home on Deepawali festival is good symbol of income, evil spirits stay on Imli tree, if boiling milk comes out of pot by mistake it is good.
9. 50% believe that god lives on Peepal tree.
10. 13% believe that a vacant house is shelter for evil spirit.
11. 56% believe in gemology.

12. No one believes on Dian.
13. 19% believe that scientific explanation of all the above beliefs is possible.
14. 62% believe that the scientific explanation of all such superstitions is not possible and only a few can be explained.
15. 94% believe in god.
16. Only one person has no mis-belief.
17. If we include the occasional believers, the number of total believers will be increased as they believe at least one superstition or the other.

## **DISCUSSION**

Some of the points that emerged during the course of the programme are summarized here. It emerged that developing rapport with various charitable societies at local level, which are involved in organization of various public programmes with huge participation like fairs and festivals would be beneficial for science communication. Motivating the priests, sages, god man and religious preachers to promote a scientific outlook can help tremendously; it could be a challenging task, as it has been evident from the history that the religious fundamentalists have been highly skeptical for scientific reasoning. If we are able to bring these people along, our task would be very simple. Most of the TV channels have some slot for religious and astrological programmes; these could be utilized for providing scientific information and inculcating a scientific temper.

Demonstration of science exhibits and science tableau besides idols and religious exhibits was an exciting experience and opportunity to observe the reaction of visitors and viewers. In the beginning, the priests did not allow the inclusion and demonstration of science tableau and science exhibits in the religious procession and temples. Most of them were of the opinion that the inclusion of such demonstrations would adversely affect the chastity of the religious programme and thereby affecting the sentiments of the people. Then, diplomatically it was told to the priests as if the goddess herself has asked in the dream to put all these demonstrations as part of the religious procession. It worked and as a result the scientific tableaus and exhibits could become part of the religious procession. It attracted a number of people from in and around the town and the programme was continued with much more vigour for all the 9 days during the festive period.

Science has been an integral part of Indian culture for the ages. While the sages were practicing yoga, they were specifically practicing the science of healthy living. Similarly, the modern science has revealed that a number of spices and flavoring plants used in Indian food, have their medicinal values. The trees of Neem, Peepal and Banyan have been the centre of early human settlements, because of their pleasant shadow and healthy products, i.e., all parts of Neem tree have their specific medicinal values, be it leaf, flower, fruit, kernel, bark, root, viscous secretions, etc. Moreover, a number of rituals, traditions, customs, etc. have been followed for the centuries; have some elements of scientific principles and attitude, i.e., the celebrations of Baisakhi on the occasion of the arrival of new crop of a number of food grains. Over the period, unfortunately, many of these rituals, traditional and customs were contaminated with a number of superstitions,

miss-beliefs and malpractices. It has to be further revamped and the old combination of science and culture has to be restored to bring back the old glory of Indian civilization.

## **CONCLUSION**

Some important conclusions drawn are being summarized below :

- B. There was not much difference between the literate and illiterate of the villages of eastern UP with regard to scientific awareness.
- C. Even literate people were not aware of energy crisis rational, use of water, pollution control.
- D. 90 % respondents were not aware of the seriousness of these issues.
- E. 70 % respondents were able to understand about these subjects through the programme.
- F. Besides routine visitors of religious bent of mind, a number of other visitors were attracted for these scientific demonstrations.

The programme has triggered an interest and excitement in science and technology in the target groups. The experiment has been able to bring science and religion together for the better understanding of each other. The world is passing through a state of obscurism lead by religious fundamentalism. The programme has been proved to be an effective means for bringing about certain attitudinal changes to salvage the humanity from the present state of uncertainties.

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