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Popularization of Science in Local Context: Case Study of Newspapers Published from Uttarakhand

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Abstract:

Science is Universal by nature, but it needs to be defined in local context because common man can better understand the logics of science in their own environments. Original science is understood by the scientific community only while general public is required to be communicated it in simple as well as in their native language. As per the definition of popularization of science, "it is nothing else than an endeavor to image scientific ideas in such a way that everyone (non- scientist) can grasp the fundamental concepts and have an idea of what science in essence is."¹

General concepts and principles of science are universals in nature. It means each and every scientific happening has same traits and impact everywhere. Logics of science are equally applicable too. That's why it becomes easy to spread scientific awareness in the local context as a medium of communication. Just publishing scientific research and information in newspapers is nothing but a mere formality of bringing the science in the public domain. Instead of this if the same science is written in local context, the more people will definitely take it interestingly and seriously. Keeping these objectives in mind a study was conducted on how to visualize scientific happenings through local context? It means is it possible to spread scientific awareness in view of local context? And if yes, then how these newspapers cover science issues in this regard? For this purpose six most circulated newspapers published from Uttarakhand were selected for the study. Amar Ujala, Dainik Jagran, Hindustan and Rashtriya Sahara were selected in Hindi newspapers category, while The Pioneer and Garhwal Post were selected in English newspaper's category.

When any local issue, related to scientific work, is covered by the newspaper it automatically gets appreciation and value for the work. As science is the part of our daily life so every news item has some elements of science in it too. Sometime newspapers adopt this approach to give a scientific treatment to the general news, but this trend is not common in practice. The similar case was found during the study while analyzing the different newspapers for the research work. On 5th December 2010 when the former chief minister of Uttarakhand, N.D. Tiwari was admitted to hospital due to some illness, each newspaper covered this news due to his news value as former Chief Minister. As most of the newspapers presented it as an informative way like 'Tiwari falls sick admitted to hospital', Rashtriya Sahara on the other hand gave it an excellent scientific touch. Instead of giving simple information about the health of former CM of the state, Rashtriya Sahara took it with basic cause of illness and warned its readers also about the use of Anti Termite Treatment in its headline. In a similar case happened when the students of Doon school developed a robot named 'iTalk' capable of conversation on any given topic. The Pioneer gave it good space with color photographs. This is the way when science can also be defined in local context, making its greater impact on local people.

Keywords: Science popularization, local context, newspapers, scientific treatment

1. Introduction

Popularization of science has many challenges in which lack of knowledge and illiteracy are the main hurdle in its growth. Though the percentage of the literacy has been improved, but the desired level is still to achieve. Twenty two languages have been recognized by the Indian constitution but most of the work of science popularization is done through English language only². It means other languages do not have original work in science popularization as most of the scientific work is mere translation. Again, as other languages do not have their own scientific terminology, they have to depend on English only. This type of unavailability of scientific terminology in other Indian languages becomes a big hurdle in actual science popularization, because most of the Indians are of the flavor of their own local language. Besides this science writing work is not done in an interesting way. Science stories, poem, satire, discussion, etc. are still not given due importance in the science popularization work. Even most of the science writer could not provide interesting science stories or article to the newspapers and magazines.

Studying the role of newspapers in science popularization in Uttarakhand, though the percentage of science coverage through newspapers was found to be 4.64%, but the concepts of science and its terminologies was not made clear. As the purpose of the study itself was to find out the present status of science popularization, presentation patterns of science news and articles and the terminological use of science in print media, it becomes imperative to know whether science is communicated in understandable way or not. It means how can a common man be able to understand the logic behind this science? Actually understanding of science does count on its terminology first. The fundamental purpose of science communication is not the mere presentation, but rather its actual understanding among the layman also. In science popularization, it does matter a lot whether a large majority of the readers perceive the actual meaning of the science or not. Writing about the common understanding of science in his article 'The Science of Scientific Writing', George Gopen says that it does not matter how pleased an author might be to have converted all the right data into sentences and paragraphs; it matters only whether a large majority of the reading audience accurately perceives what the author had in mind³. It is quite obvious that media is the most powerful medium of analyzing the varied aspects of public opinion. Among all the available media, print media is long lasting as well as of greater impact. As it has more space to say, it has possibilities of varied concepts also. As far as coverage of science news through newspapers is concerned, most of the science news items are taken from agencies. Though newspapers give coverage to science related issues, but it was found that most of the newspapers do not try to impart the basic knowledge of science rather they touch it superficially. The way of presentation of science news and the language used cannot convey the science among the readers because scientific terminology and monotonous way of science news writing creates a gap between science and society. During the survey, it was found that most of the readers did complain against scientific jargons commonly used in science news items through newspapers. To know the actual condition of science news coverage through newspapers, a content analysis was undertaken for one year duration from June 2010 to May 2011. Communicating science in local context either in the form of the local language, events or knowledge will definitely serve the actual purpose of popularization of science. The purpose of the present study was to analyze science coverage in newspapers published from Uttarakhand. For this purpose all the published scientific news or items were analyzed in order to know the tone and purpose of the contents.

2. Objective of the Study

1. To know the coverage of science news or items through newspapers published from Uttarakhand
2. To analyze science coverage in newspapers.
3. To know the impact of science coverage and its relevancy through public opinions.

3. Area of Study: Uttarakhand

The present study has been conducted in Uttarakhand. Along with 13 districts viz. Pauri, Chamoli, Rudraprayag, Tehari, Uttarkashi, Dehradun, Almora, Bageshwar, Pithoragarh, Nainital, Champawat, Udham Singh Nagar, Haridwar Uttarakhand became separate from the Uttar Pradesh as a 27th state of the Indian Union in November 9th 2000. Bounded by UP on the south, Nepal on the east, Himachal on the west and the China on the northeast, Dehradun was declared its interim capital³. Dehradun, the Capital of Uttarakhand, is well-known educational hub world over. Most of the central institutions, like Forest Research Institute. Oil and Natural Gas Corporation, Indian Institute of Petroleum, Wild Life Institute of India, Wadia Institute of Himalayan Geology, etc are in Dehradun. Besides this, for the popularization of science, the proposed science city is to be established in Dehradun in the near future. As far as literacy rate is count according to census 2001 we are at the figure of 72% where 60% females and 84% males are literate⁴. District- wise literacy shows that district Nainital is the most literate with 80% literacy rate while Haridwar is the least at 65% literacy rate. Even in comparison to others, this newly state has well treasurers of natural resources like water and forest. Keeping all these favorable conditions in mind this becomes important to know the role of media, to be the part of development of Uttarakhand, in this region⁵.

4. Methodology

Uttarakhand comprises of 13 districts namely Almora, Bageshwar, Chamoli, Champawat, Dehradun, Haridwar, Nainital, Pauri Garhwal, Pithoragarh, Rudraprayag, Tehri Garhwal, Udham Singh Nagar and Uttarkashi⁶. Because of time constraints and geographical position of the state, it was not possible to collect the data from all the districts. So the method of random sampling was adopted here to select any five districts for the study point of view. That's why out of all the 13 districts five districts, viz Dehradun, Nainital, Pauri Garhwal, Chamoli and Pithoragarh were finally selected for the study.

Again, with the help of purposive sampling method two major towns from each district (One headquarters of the district and the other at a distance of 30 to 40 km around) were selected for the study. And by this way total ten towns viz Dehradun, Rishikes, Srinagar, Pauri, Haldwani, Nainital, Pithoragarh, Didihat, Gopeshwar and Karnprayag were selected as a sampling units from all the five districts.

Primary and secondary data were collected for the present study. For the collection of primary data field visits were made, while for the secondary data research work, newspapers, magazines and experts were consulted. Primary data were collected from all the five districts through questionnaires. The researcher has distributed about 350 questionnaires to the respondents. The questionnaires after filling and returned were 325. Out of these, there were some questionnaires which were not properly filled or answered. Therefore, such questionnaires were rejected. Hence 300 questionnaires which were properly responded and most of the questions of whom were answered were selected for the study purpose.

4.1. Selection of Newspapers for Content Analysis

The researcher applied purposive sampling methods in selection of newspapers published from Uttarakhand for content analysis. The newspapers selected are from Hindi and English language as Hindi language newspapers are highest in number of publication as well as in circulation followed by the newspapers published in English language. According to RNI's data, there are total 1355 newspapers published from Uttarakhand in different languages. Out of these total newspapers there are maximum 1139 Hindi language newspapers while 82 newspapers of English language are published from the state⁷. Newspapers published in other languages are not such popular as compare to Hindi and English language newspapers. In the category of Hindi language 'Amar Ujala (1,89,746)⁸', 'Dainik Jagran (1,17,360)⁹', 'Hindustan (65000)¹⁰' and 'Rashtriya Sahara (67000)¹¹' while in the category of English 'The Pioneer (24,163)¹²' and 'Garhwal Post (21,650)¹³' were selected for the content analysis.

4.2. Selection of Contents

Every page of each newspaper was included in the study. Maintaining the objectivity of the study, science news items were divided into 8 categories viz Environment, Health, Information Technology, Science and Society, Space Science, Wild Life, Science and Technology and Miscellaneous. Every science news/article was measured in centimeters and the total science news coverage area was then subtracted from the total printed area. In order to have impartiality in content analysis, first of all a cluster of two months was made, starting from June 2010 to April 2011. By this way total six clusters were made for one year period. Again from each cluster, one composite week was made. It means from a cluster, out of all Mondays, one newspaper was selected by randomization. This process was applied to all other days, viz Tuesday, Wednesday, Thursday, Friday, Saturday and Sunday. It means from all the six clusters, six composite weeks (42 days) were made for the content analysis of newspapers. By this way each newspaper was analyzed for 42 days (from June 2010 to May 2011).

4.3. Science Coverage through Newspapers

4.3.1. Science Coverage by Hindi Newspapers

After calculating news coverage area from each newspaper, popular science coverage area was separated to find out the percentage share of science coverage in newspapers. From each newspaper, numbers of science items were selected first. This way the area covered by each science item was measured in sqcm. The detail of the popular science coverage has been given below as:

Newspaper	No. of Science Items	Area Covered by Science Items (sq cm)	Ares of Total News Coverage (sq cm)	% of Science Coverage Area (cm)
Amar Ujala	148	22242	816065.75	2.73
Dainik Jagran	171	33786.75	927802.75	3.64
Hindustan	212	48511	899947.5	5.39
Rashtriya Sahara	267	56100	1058221	5.30
	798	160639.75	3702037	4.34

Table 1: Science Coverage by Hindi Newspapers

The above table shows that the popular science items published in Rashtriya Sahara during the analysis period were highest in number. Amar Ujala was at the bottom as far as the number of science items is concerned. There were total 798 popular science items covered by all the four Hindi newspapers. Thus the average percentage of popular science coverage, is 4.34%. It is clear from the above table that Hindustan gave maximum space to popular science coverage which was 5.39%. On the other hand Amar Ujala gave the lowest coverage (2.73%) to popular science items/articles. Rashtriya Sahara was at the second position by giving 5.30% space to science items while Dainik Jagran was at third place with 3.64% popular science coverage. In the graphical presentation the percentage share of each newspaper has been given below.

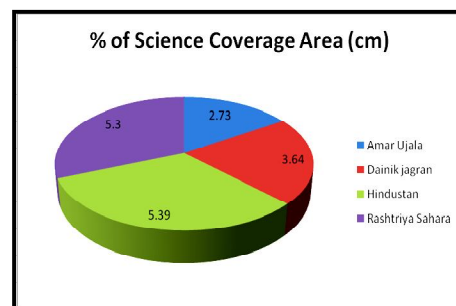


Figure 1: Graphical Presentation

4.3.2. Science Coverage by English Newspapers

Newspaper	No. of Science Items	Area Covered by Science Items (sq cm)	Ares of Total News Coverage (sq cm)	% of Science Coverage Area (sq cm)
The Pioneer	131	39909.5	1049892.5	3.80
Garhwal Post	122	44093.75	516449.75	8.54
	253	84003.25	1566342.25	5.36

Table 2: Science Coverage by English Newspapers

It is evident from the above table that during the analysis period both the English newspapers published 253 science items including news, articles, stories etc. There were 131 science items in The Pioneer while Garhwal Post published 122 science items. As far as their coverage in percentage is concerned, Garhwal Post gave 8.54% space to science items while The Pioneer gave only 3.80% during the analysis period. The above table shows that the average percentage of science coverage by both the newspapers was 5.36%. By comparing both the language newspapers, it is clear that more space (5.36%) was given to popular science coverage by English newspapers as compare to Hindi newspapers (4.34%).

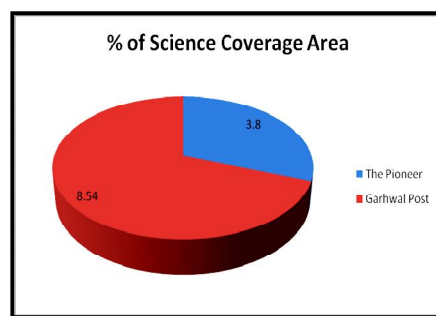


Figure 2: Graphical Presentation

4.4. Details of Science Coverage

Popular Science coverage through newspapers was categories into eight different categories. These categories are Environment, Health, Information Technology, Science and Society, Space Science, Wild Life, Science and Technology and Miscellaneous. In the table (1) details of the popular science coverage done by Hindi newspapers has been given while details of science coverage made by English newspapers have been given in the table (2).

4.4.1. Details of Science Coverage by Hindi Newspapers

Details of Science Coverage (Hindi Newspapers)					
S. No.	Science Category	Science Items	Area Covered by Science Items (sqcm)	Total Science Coverage Area (sqcm)	% of Science Coverage Area
1	Environment	134	30231.00	160639.75	18.82
2	Health	291	59960.25		37.33
3	Information Technology	33	9999.50		6.22
4	Science & Society	62	10407.25		6.48
5	Space Science	19	3386.00		2.11
6	Wild Life	50	5206.50		3.24
7	Science & Technology	70	19066.25		11.87
8	Miscellaneous	139	22383.00		13.93
	Total	798	160639.75	160639.75	100.00

Table 3

Above table shows that the out of total 798 science items published by all the four selected Hindi newspapers, the highest number 291 were on health followed by Environment (134), Science and Technology (70), Science and Society (62), Wild Life (50), Information Technology (33), Space Science (19) and 139 on Miscellaneous. As far as the percentage of the popular science coverage, is concerned, the maximum space was given to Health items while minimum space was given to Space Science. There is 37.33% coverage to health issues while 2.11% space was given to 'Space Science' which is the lowest among the all popular science categories.

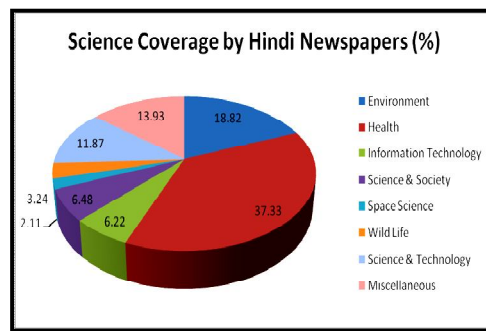


Figure 3: Graphical Presentation

4.4.2. Details of Science Coverage by English Newspapers

Details of Science Coverage (English Newspapers)					
S.No.	Science Category	Science Items	Area Covered by Science Items (sq cm)	Total Science Coverage Area (sq cm)	% of Science Coverage Area
1	Environment	98	26531.00	84003.25	31.58
2	Health	67	21747.00		25.89
3	Information Technology	4	673.75		0.80
4	Science & Society	8	2410.25		2.87
5	Space Science	12	3204.50		3.81
6	Wild Life	28	12851.50		15.30
7	Science & Technology	8	2508.25		2.99
8	Miscellaneous	28	14077.00		16.76
	Total	253	84003.25	84003.25	100.00

Table 4

Above table shows that out of total 253 science items published by both the English newspapers. The highest numbers of popular science items were on Environment (98) followed by Health (67), Wild Life (28), Miscellaneous (28), Space Science (12), Science and Society (8), Science and Technology (8) and Information Technology (4). As far as the percentage of popular science coverage is concerned, the maximum space was given to Environment (31.58%) followed by Health (25.89%), Miscellaneous (16.76%), Wild Life (15.30%), Space Science (3.81%), Science and Technology (2.99%), Science and Society (2.87%) and Information Technology (0.80%).

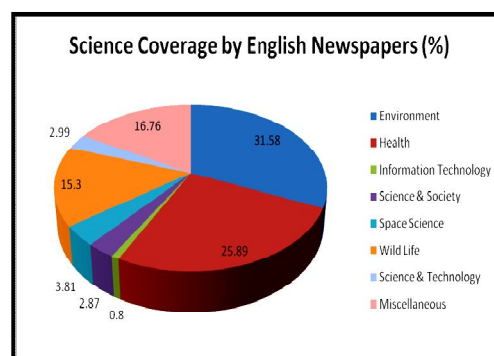


Figure 4: Graphical Presentation:

4.5. Science in Local Context: Case study of six Newspapers

Generally all the newspapers take science news from the agencies. It means most of them are of national or international interest. So it becomes difficult for the common man to correlate this information with his own environment or surroundings. If these news items have any relevancy to them, then only readers do read those otherwise most of the science news goes down the drain. Whenever science in the local context is covered by these newspapers, people read them carefully, whether they are health based, environmental or any other type.

During the outbreak of diseases, local newspapers always do their best in spreading information, for the sake of its readers. For example, in 2010 when 'dengue' has become epidemic in Dehradun city and some other areas of Uttarakhand, newspapers disseminated all related information and make the public well aware about it. On this ground regional newspapers played a vital role

in spreading the information regarding its treatment and precautions suggested by the doctors. Daily update about the number of patients and the information about the government's efforts to control the disease was the routine of the newspapers.



Figure 5: Local Health Issues and Media Coverage

From the above news covered by various newspapers, it is clear that public were given all the related information to make them aware about all the facts. Newspapers did not only disseminate the information about these diseases but other developments or its cause and effects were also given space which made the readers well equipped in this regard. Besides, this way of presentation of these news items make them more catchy and valuable. Using crossers, inset box, graphics and color photographs show that newspapers better know how to convey the message to its readers. Giving news in different angles makes it more live so that the reader can easily understand the situation. 'Short news with more news' has now become the concept of newspapers.

It will be wrong perception to think that 'what relevancy a global issue has in the rural area'? Marshal McLuhan's term of the global village has been proved everywhere and even the villagers of Uttarakhand are not exception to this theory. Villagers now are well aware, though not in depth, about the climate change, global warming, Cancun conference and many more. Though there is limited access of newspapers in rural areas, but the actual readers do arrange it anyway and try to adjust him with the global happenings and feel better to be the part of the mainstream of the society.

People have now become much alert for the relevant information, how to expose their work and what the precautions be taken in agriculture, environment and on health related issues. Newspapers now give value to the local developmental issues to whether they are environmental, agricultural, new findings and any other technological advancement.

4.6. Amar Ujala



Figure 6: Local Science News Coverage

Amar Ujala and Dainik Jagran being the most circulated newspaper in Uttarakhand have high penetration in the rural areas too. Due to this reason people of the far flung area have also come under the well media coverage. Now the traditional knowledge and some other untouched issues have got the route to come out through these newspapers. Covering the local science issue by the media not only give the value to local science, but stimulate the scientist or others for new findings also. This is the reason that some of the important news comes out of its hole. Such news stories like the death of a female deer in December 9, 2010 Amar Ujala gave it a good space. This was a news of a musk deer who was found dead after a prolong disease in Kedarnath Wild Life Sanctuary¹⁴. This news story was also raised by the other newspapers. In other next issues Amar Ujala did follow up of the story, though raising it with a different angle.

Besides these other issues like hybrid crop, Polly house system, global warming, production of medicinal plants and many more, which were alien to the common people has now become a part of their work culture.

When a common man gets the opportunity to highlight his work with the help of media and at the same time when media becomes a tool to spread a global issue at the local level, then the relevancy as well as the necessity of the media becomes obvious. In December 2010, Amar Ujala published another interesting story of a villager named Prem Singh Rawat (from Lohaghat, Champawat district of Kumaon Mandal, Uttarakhand) who became a pioneer in the field of agriculture¹⁵. It was told by the newspaper that Prem Singh Rawat was the first person who produced hybrid Cauliflower in this area. Before him, nobody knows what the hybrid crop is called? He was the only person who started Polly house system in the area. Now working with the same pattern a number of people in that area have good earnings from this type of agriculture system. Similarly, when a conference was held on global warming in Dehradun, all the newspapers gave a valuable space to this program and convey its relevant message up to far flung area of the state. This is the reason that now even a person sitting in the corner of the state is well aware about all the happenings that are taking place at the global level. On the occasion of Environment Day (5 June 2010) Amar Ujala published six big news articles like 'Prakriti se Chhed Chhad karen Band', 'Pariywaran ko Samjhe Naitik Kartabya', 'Paryawaran Bachana Hoga with various local news of environmental activities. In the month of April-May 2010 Amar Ujala covered many stories on merits and demerits of new crops of Wheat and Mango. In the month of August, Amar Ujala and Dainik Jagran published equally 34 science based news articles like 'Prarthana se door hoti hai bimari', 'Caron se jyada hoti hai global warming', '3d express coach', 'Camical wale fal- sabjiyon se sahame saansad', 'Jila vigyan seminar', 'Duniya ki sabse jahareeli makdi', 'Asthama se prostate ka seedha nata.' Among all these 34 science news items only three were on local context otherwise most them were of national or international level. Though all the news items were quite interesting for the common man, but these were still not free from the uses of scientific jargons which would have annoyed the readers again.

4.7. Dainik Jagran



Figure 7: Local Science News Coverage

Availability of newspapers has direct concern with benefits of the society. It means if there are a maximum number of newspapers in any area definitely maximum issues of that area will get focus naturally. Giving local science issues space in newspaper is an excellent motivating factor in all kinds' of development. The coverage of the newspaper shows that how the reporters have nose for the news in their surroundings. In a conference held in Dehradun on December 2010, the impact of global warming was discussed there. In the conference it was said that due to this global warming, water resources were depleting fast, resultant of which there may be crisis of water in the coming future. In the table (2.3) above this story has been mentioned with the title 'Global Warming Ka Jal Sansaadhano Par Ulta Asar'. One other news story covered by the newspaper was also a good one as most of the people were not aware about the latest medical facility available here and that was Cochlear Implantation. Previously people have to go to Delhi and other places for this treatment¹⁶. After two years research work Pant Nagar University developed a variety of peanuts that can be produced here in Uttarakhand. This news not only highlights the efforts of our scientist at the local level but also encourage the farmers to produce this cash crop at their home land which minimize dependency to other states.

Similar news that has more concerned about the natural resources like Water, Forest and Soil was given front page space with color photographs and experts' views in this regard. In this news the bad impact of some special kind of trees like Eucalyptus, Lantana, Poplar, etc. on environment was highlighted. These varieties of tree are not only making the land dry but also destroying the biodiversity of the state. Experts say, as per the story, that these species of trees are making the soil acidic which is more dangerous¹⁷. In a conference held in October 6, 2010, in Dehradun scientist from various part of India assembled here to discuss the problem of congestion in the communication process. Under the theme of 'Recent trends in Microwave and Millimeter Wave Technology' scientist suggested various uses of microwave and millimeter wave technologies¹⁷. This conference was held for two days here, which

was covered by most of the newspapers. Local efforts in various research works cannot be ignored, though in past, they could not come out due to ignorance of media but now every big or small effort have found their way to come to the limelight.

Medicinal plants of Himalayan region have been proved to be useful in many incurable diseases. One such plant named 'Jenthujalum' was identified as a valuable in the treatment of Cancer. Scientist of the H.N.B. Garhwal University Srinagar Garhwal claims that the extraction of this plant has anti cancer elements which can lead to a great success in the coming future. Dainik Jagran gave space to this story on December 10, on top of the inside page with inset box.

Giving space to these kinds of news items definitely make the public more cautious about their surroundings as well as stimulate their work in a right direction. Automatically the basic purposes of the science communication get solved up to some extent this way.

4.8. Hindustan



Figure 8: Local Science News Coverage

Role of the Himalayan region in environment conservation is well known to all. Economic changes and growing population is the greatest threat to the ecology of the Himalayas. In recent years, deforestation in the foothills and the Middle Himalayas and overgrazing on the high pastures has led to soil erosion and other environmental problems here. Rapid population growth has accelerated pollution, and Himalayan streams that were once clear are now polluted with refuse and sewage. Hilly people who use the water for drinking purpose are mostly suffering from dysentery, cholera and typhoid epidemics. Having these problems as well as the responsibility of preservation of this environment make the Uttarakhand special venue for the discussion like climate change, wildlife conservation, melting of the glaciers and many more. Many such programs like workshops, seminars, campaigning and other activities are common here in Uttarakhand. Due to such activities newspapers have to give them space and naturally the message goes to the last man sitting far away from the venue.

On June 6th 2010, Hindustan published a story with astonishing facts about the melting of glaciers and impact of global warming on Himalayan glacier. In this seminar which was organized in Dehradun, the former vice chancellor of H.N.B. Garhwal University and Fellow of National Science Prof. A.N. Prohit said that it is a misconception that due to the presence of carbon dioxide glaciers is melting. The basic fact behind the melting of glaciers is the large quantity of water vapor in the environment. Further he elaborates that the presence of CO₂ in the environment is only 3% while water vapor is up to 95% which is the big threat to the environment. Giving tips to preserve the environment, environmentalist Sunderlal Bahuguna suggested to plant more trees of broad size leafs while Dr. Rajendra Dobhal, Director General, UCOST, Dehradun, said that only collective efforts of the society can mitigate the bad impact of the global warming. Making this news more valuable newspaper placed it on the top left inside the newspaper and put some crossers and one inset box also. In the inset box newspaper present some valuable data concerning with the Himalayan glacier as the total number of glaciers in the Himalayan region are 9575 while 1916 glaciers are in Uttarakhand alone. This state, Uttarakhand, is also known as the most snow covered area of the Nation¹⁸.

Focusing on the status of wildlife species in Uttarakhand, newspaper published some news stories on most endangered species like Monal (state bird) and Musk deer (state animal). On October 2010, newspaper published a news story on Monal which has now come in the category of most endangered species. Newspaper said that after the death of Musk deer the only female in Kanchula Khark (Kedatnaath Sanctuary) the sate bird Monal is now under the threat as the number of these birds was continually going down. On 11th December 2010 newspaper gave a front page story on the production of Musk in Uttarakhand. According to this news, presently there are only 14 Musk Dears in Bageswar (Kumaon). The musk, which is found from musk deer, is not only used in life saving drugs, but also in Bronchitis, Paralysis, Neurologic related as well as in cosmetics too.

Covering some more news on science related issues newspaper on the behalf of a seminar organized here, proclaimed that it is the science only which made communication easy. Coverage of some workshops, campaigning of HIV/AIDS, science exhibition, usefulness of butterflies and biodiversity, news item of Doppler effects, etc. most valuable news were given good coverage by the Hindustan.

4.9. Rashtriya Sahara



Figure 9: Local Science News Coverage

Most of the news items covered by all the newspapers were found common, because these were program based. A variety in news cannot be expected until a new approach in science news coverage is developed. For this purpose media houses as well as scientific institutes have to come forward to flood all the newspapers with scientific information. Every newspaper has its own way of presenting news. When Rashtriya Sahara covered news on the health of former chief minister N.D.Tiwari, it gave it in the scientific way. On 5th of December 2010 all the prominent newspapers of Uttarakhand cover the story on the health of Narayan Dutt Tiwari, former chief minister of Uttarakhand. This story was covered with different angles by different newspapers. Amar Ujala covered it under the headline of, 'Purv Mukhya Mantri ND Tiwari Doon Aspatal me Bharti', while Dainik Jagran also gave a simple title to this news as 'ND Tiwari ki Tabiyat Bigadi'. Hindustan and Garhwal Post gave the title to this news 'Keetnashak Spray se Bigda ND ka Swasthya' and 'Tiwari falls sick, admitted to Doon Hospital' respectively. But on the other hand Rashtriya Sahara using effective language and angle to this news presented it into scientific manner. The title to this news was given as 'Sawadhan: Kahin Aapki Tabiyat na Bigad de Anti Termite Treatment'¹⁹. This way of presentation makes scientific value of general news. Public opinion reveals that whenever any information or news is presented in simple, as well as interesting language it catches maximum attention.

Similar case was found during the study when the coverage of science exhibition was focused on the street level but Rashtriya Sahara could not give it a valuable space. In October 2010, a two day's science exhibition was organized in an Inter college here in Dehradun. This was a block level science exhibition, in which 32 schools/colleges participated. In the exhibition different kinds of science models on 'Role of Science in Present Time', Agriculture, Transportation, Bio-diversity Conservation, Agriculture technology, Communication, Green Energy, Community Health and Environment, Mathematics, etc. were prepared by the students²⁰. This reporting was given such intense focus between the colonies or streets which remind us like a cricket tournament being played in a city. Definitely this type of reporting stimulates the local people and competitors to work hard to give good fight next time. Though this was not the first time when students were trying to convey their message through these models, but the media gave them a valuable space this time.

Imitation and follow up are the good stimulator in the learning process and media should keep this in mind while covering such news stories. Though Rashtriya Sahara covered this news in catchy style, but confined it to the single column cannot be said a justice with this valuable news. If this science exhibition be given good space with the photographs of science models and interview of the winners, definitely it would bring a good message to the readers and ultimately more and more students would be encouraged to do better next time. Next day the same news was covered from Doiwala block which was given a single column again mentioning only the winner of the exhibition. This type of news coverage is nothing but a formality or like space filler only.

On the other hand, when newspaper raise any story it gives good space as well as catchy headlines, color photographs and even crosser, inset etc. which mean a good package of a news. In December, 8, 2010, Rashtriya Sahara covered an exclusive story on sound pollution. In this story newspaper tried to explore those who are suffering from sound pollution. In the name of those surfers, newspaper tried its best. With the help of this news, newspaper tried to make public aware about the bed impact of sound pollution and suggested some majors to be taken to solve this problem. Bio-diversity is considered as a key of development of that area. While inaugurating a book titled with 'Bio-diversity potential of the Himalaya' in Nainital, then governor of Uttarakhand Marget Alwa said that the identity of this state is due to its rich bio-diversity. Some facts about the bio-diversity book also highlighted that there are five Biosphere Reserves in Himalaya, 28 National Parks and 98 Sanctuaries under conservation.

On the same day one another news was published from Nainital concerning about the mysterious death of the fishes in Naini Jheel (fish pond). This news was also given good coverage by the newspaper with inset box and black and white photographs. Besides this Rashtriya Sahara covered other news like seminar on global warming, HIV/AIDS campaign, say no to polythene and health issues also relating them to the local concern.

4.10. *The Pioneer and Garhwal Post*

Figure 10: Local Science News Coverage

Climate change has engulfed everybody and the Himalayan region of Uttarakhand is not exception to this change. On its report on June 11, 2010, The Pioneer published environmental news on the bad impact of climate change in the high altitude of Uttarakhand. Given front page space to this news item newspaper tried to pull out the attention of the readers as well as scientific community towards this problem. Giving the reference of the study, jointly conducted by Forest Research Institute (FRI), Dehradun and Space Application Centre (SAC) Ahmedabad, newspaper highlighted that high-altitude alpine meadows or Bugyals of Uttarakhand were badly affected by global climate change. According to the study the famous Bedani Bugyal in Nanda Devi Biosphere Reserve is being encroached upon by different tree species resulting in the timberline extending to a higher altitude²¹.

When any local issue, related to scientific work, is covered by the newspaper it automatically gets appreciation and value for the work. The same happened with a student of Doon school who developed a robot named 'iTalk' capable of conversation in any given topic. This robot can talk with anybody in English and understand humor also. The big surprise behind this robot was that it was developed by 12th class student²². The Pioneer gave it good space with color photographs but alas other newspaper did not give it even a single column.

Performance of Uttarakhand in environmental conservation is well established in the country. Even planning commission of India has marked the state with excellent performer in the conservation of India. Though this news was given space by most of the newspapers but Garhwal Post published it with a big space and color text as a box news item. During the 'Wild Life Week' observed in first week of the October programs were celebrated in different places. Garhwal Post covered many of them with proper space and colored photographs. On October 7, newspaper published news on wild life week celebrated by an institute. Newspaper highlighted the efforts made by the institute in conservation of wild species. Students of that institute did survey of the nearby forest and draw some conclusions also.

The role of newspaper in awareness is obvious in every walk of life. The most vibrant example came to notice when all the newspapers highlighted the cases of adulteration of milk. After publishing this news time and again by the newspapers, this news made the public much aware resultant of which people came on the roads to demonstrate against this activity of the adulteration. Making people more conscious about the environmental heritage, Garhwal Post on 7th December published an exclusive interview of 'Miss Uttarakhand 2010'. Speaking of her concern about the environment, Miss Uttarakhand urged the people to plant more trees to fight against deforestation and asked for help maintaining the greenery and scenic beauty of Uttarakhand. Garhwal Post adopted a good approach to spread the message of environment conservation through the winner of beauty contest²³. Adopting such techniques not only make the public aware about the message but attract them to read the relevant news items also.

4.11. *Impact of Science Coverage at Local Level*

To know the public perception about science coverage in newspapers a questionnaire was administered to 350 respondents. Out of which 300 questionnaires were found to be correct for the study point of view. There were 159 male and 141 female respondents from different parts of the study field. All the respondents included in study were educated. Though there were different questions in the questionnaire but as per the requirement of this research paper only three most relevant questions are being discussed here. The purpose of discussion of these questions here is to know the impact of science coverage through newspapers on local people.

4.11.1. *Science Coverage by the Newspapers*

In order to know the actual science news coverage through newspapers a question was asked as: 'Does your newspaper cover science related issues?'

The responses obtained as:

Responses	No. of Respondents	Percentage
Yes	176	58.7
Seldom	100	33.3
Don't Know	24	8
Total	300	100

Table 5

Above table shows that out of 300 respondents, 176 i.e. 58.7% respondents say that their newspaper publish science related news items. On the other hand 100 i.e. 33.3% respondents say that newspaper 'seldom' publish science related news items. Other 24 i.e. 8% respondents say that they 'do not know' whether newspaper publish science related news items or not.

4.11.2. Satisfaction for Popular Science Coverage:

In order to know the opinion of the respondents towards popular science coverage, a question was asked as: 'Are you satisfied with the coverage of popular science in newspapers?'

The responses obtained as:

Responses	No. of Respondents	Percentage
Satisfied	109	36.3
Partially Satisfied	156	52
Not Satisfied	35	11.7
Total	300	100

Table 6

It is clear from the above table that out of 300 respondents, 109 i.e. 36.3% respondents are satisfied with the coverage of popular science in newspapers while 156 i.e. 52% respondents are partially satisfied. Only 35 i.e. 11.7% respondents are not satisfied with the coverage of popular science in newspapers.

4.11.3. More Space for Science News

In order to know the opinion of respondents about providing more space to popular science coverage in newspapers, respondents were asked as: 'Should more space be given to popular science coverage in newspapers?'

The responses obtained as:

Responses	No. of Respondents	Percentage
Yes	233	77.7
No	67	22.3
Total	300	100

Table 7

Above table shows that out of 300 respondents, 233 i.e. 77.7% thinks that more space should be given to popular science coverage in newspapers. On the other hand 67 i.e. 22.3% respondents do not think that more space should be given to popular science items in newspapers. In the graphical presentation their percentage wise share has been given below.

5. Conclusion and Suggestions

Uttarakhand, being rich in forest cover, great in natural resources, better literacy rate, and better sex ratio in comparison to other states, has a better position in science news coverage through newspapers here. Study shows that there is about 4.64% of science coverage through newspapers in Uttarakhand while as per the survey conducted by Indian Science Writers' Association (ISWA) it is only 3%^a. Besides this it was found that health and environmental issues are the most influential factor in science coverage. As far as the coverage by Hindi newspapers is concerned, there is 37.33% coverage to health issues and 18.82% of environment issues. Similarly, in English newspapers 25.89% coverage area was given to health issues while 31.58% space was given to environmental issues. Though the most science coverage was global in nature, but environment and health issues are often raised in a local context. And this is the only reason when a reader gets influenced towards science news reading. But there is a need to co-relate science with the local happenings so that people can adopt science easily.

Content analysis of newspapers shows that a good number of science issues were given a proper space by the newspapers published from Uttarakhand, but the traditional science and medicine system of the villagers need to be published so that it can be used for the public welfare. During the study it was found that science exhibitions related news items were not given due space by the newspapers. Most of the newspapers confined these news items in the single columns only. There is a scope to highlight these kinds of news items in a proper way. Models exhibited by the students of Intermediate Colleges in science exhibitions must be given proper space by the newspapers. Besides this, expert's opinion on these models can be added to popularize it in a big way. Scientific terminologies should be explained for the sake of the general public.

As far as the presentation of science news coverage through newspapers is concerned, only 36% respondents were found to be satisfied otherwise most of them were not. It means approximately 64% were either partially or not satisfied with the way the scientific issues are covered by the newspapers. More than 77% respondents want more space for science news or items. It means at the local level people too are more cautious about the science issues. There is a need to provide a good space to science news in newspapers. Besides this availability of newspapers in every school and college library should be ensured so that students can have the access of the all information and happenings of the world around. Workshops and science awareness programs in school, colleges and village levels are necessary to inculcate scientific temper in those.

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