Communicator

Volume LII, Number 4, October–December 2017

Contents

Communicator
Vol. LII (4), October–December, 2017
03

IMPACT OF BEHAVIOUR CHANGE COMMUNICATION ON NON-SKELETAL FLUOROSIS

A Case Study from Tamil Nadu

P.H. Rao[1], S.Srikumar[2],
Gnanam S[3]. & P. Prathyusha[4]

1 Fellow, IIM (Bangalore) & CEO, Centre for Symbiosis of Technology, Environment and Management (STEM), Bengaluru, India.
email: drphrao@stemgroup.org [*Corresponding Author*]
2 Director (Projects), STEM, Bengaluru, India.
3 Manager-Data, STEM, Bengaluru, India.
4 Research Executive, STEM, Bengaluru, India.

Abstract

Fluorosis is a major public health problem caused by ingestion high concentrations of fluoride through drinking water, food, and other items, over prolonged periods. It manifests in three forms – dental, skeletal and non-skeletal. Prevention is most appropriate to mitigate fluorosis problem as there is no cure. A comprehensive approach - three pronged namely school, hospital and community was adopted in two district of Tamil Nadu under the Hogenakkal Water Supply and Fluorosis Mitigation (HWS & FM) Project. Behaviour change communication resulted in people using safe water supplied by the project; increase in consumption of food rich in micronutrient important for mitigation of fluorosis; decrease in consumption of items with high fluoride content such as black tea, areca nut etc. The base line and end line data revealed that there has been reduction in symptoms of non-skeletal fluorosis. This was associated with reduction in the level of fluorides in the urine of people affected by non-skeletal fluorosis.

Keywords

Behaviour change, Social marketing, Swachh Bharat, Sanitation, Hygiene

Fluorine is a highly reactive element hence often found as fluoride in nature, mainly in earth crust. Fluoride is a micronutrient and is essential for wellbeing of teeth and bones. Adequate intake of fluoride prevents 'caries' in teeth. However, ingestion or inhalation of high concentrations of fluoride over prolonged periods causes fluorosis, a public health problem which cripples the affected people. Men, women and children of all age groups are affected by it. Dental fluorosis starts with appearance of white patches. In the more severe form, reduced mineralisation of the enamel results in stained and pitted teeth. Progressive accumulation of fluoride in bones, over many years, results in skeletal fluorosis. Early symptoms include stiffness and pain in the joints (WHO, 2010). Due to both beneficial and detrimental effects fluoride is often referred to as 'double edged sword' (Park, 2011).

Non-skeletal forms of fluorosis include symptoms such as muscle fibre degeneration, low haemoglobin levels, excessive thirst, headache, skin rashes, neurological manifestations, gastro intestinal problems, urinary tract malfunctioning, repeated abortions, male sterility, etc. By detecting early, non-skeletal fluorosis can be prevented from developing in to a more severe and debilitating forms of skeletal fluorosis.

Globally fluorosis is endemic in 25 countries, including India, affecting tens of millions (Susheela & Mudgal, 1999). In India 230 districts of 20 States are affected by high levels of fluoride. In 2014 the population at risk in the country is estimated at 11.7 million (DGHS, 2014, p. 5). In Tamil Nadu, Dharmapuri and Krishnagiri districts experience regular spells of drought and also do not have perennial water storage sources. This has led to high fluoride concentration in ground water sources. Predominant dependency on borewell water for drinking renders the people in these districts susceptible to high risk of fluorosis. The Government of India initiated the 'National Programme for Prevention and Control of Fluorosis' (NPPCF) during the 11th Five Year Plan in 2008-09 with the aim to control fluorosis. In the first phase 100 districts of 17 States were covered and Dhramapuri district was included in the first year 2008-09 of the first phase (DGHS, 2014, p. 23).

Review of Literature

Role of Drinking Water

Primary sources of intake of fluoride are drinking water and water used for cooking. The rate and extent of fluorosis was found to increase in Manur block of Tirunelveli District with increase of fluoride level in drinking water and age. Ground water is the main drinking water source of these selected study areas (Gopalakrishnan, Viswanathan & Ilango, 2012). In Dhar district,

Madhya Pradesh it was found that inspite of safe water being provided under fluorosis mitigation project, people continue to use water from hand pumps for drinking as well as cooking. This has led to reduction of fluoride level only in eight people out of 21 during impact assessment. Hence, there is need to motivate people with using appropriate communication strategies (PSI, 2011).

Role of food and other items

Various food items, especially packaged food, and other items such as black tea, pan, and black salt and exposure to industrial emissions also contribute to ingestion of fluoride. A study of school children in villages having different levels - low, medium, and high - in drinking water in North Karnataka reported positive association between consumption of jowar, with severity of dental fluorosis. Children who consumed jowar had 2.67 times more chance of getting severe dental fluorosis compared to those who did not. Prevalence of severe dental fluorosis was more among the children who started consuming jowar before eight years of age compared to their counterparts (Chandrasekhar, Thanakappan & Sundaram, 2010). A study of health status of children in the age group 7-9 residing in low endemic fluoride affected areas of Chittor district in Andhra Pradesh (Lakshmi, 2013) found the average intake of fluoride through food (3.09 ppm) is higher than that through the drinking water (2.48 ppm).

Effects of change in diet and nutrition supplementation

The Guidance Manual on 'Integrated Fluorosis Mitigation' (NEERI, 2007) offers a list of – a) calcium rich food; b) vitamin C rich food; c) iron rich food and d) anti-oxidant rich food that can be consumed regularly and in higher frequency and quantities and e) food containing high fluoride content, which can be avoided. Consumption of *amla* (gooseberry) powder may play an important role in mitigating fluoride-induced toxicity. Mean urinary fluoride level declined in a group of residents of Bhupnagar a fluoride endemic village in Gaya district, Bihar, who were given amla powder as dietary supplement for nine months compared to a control group (Ranjan & Yasmin, 2015). Analysing debilitating Juvenile Skeletal Fluorosis in Bhil tribe from Jhabua district of Madhya Pradesh, Sapur (2012) argues that, in addition to providing safe drinking water and supplementation of micronutrients such as Calcium, Magnesium and Vitamin C through diet or drugs to address fluorosis action needs to be taken to address overall nutritional deficiency and malnutrition. Complaints of patients suggestive of fluorosis attending a clinic of Fluorosis Foundation in Delhi disappeared after one month of interventions including

diet counselling for promoting intake of essential nutrients, micronutrients and antioxidants through dairy products, vegetables and fruits. A pictorial booklet revealing various aspects of food viz. items that need to be eliminated and how intake of larger portions of fruits, vegetables and dairy products are possible through fruits juices, buttermilk, milk-shakes, salads and soups, were provided to every patient when they come for counselling, to constantly reminding them and reinforcing the message (Susheela, Mondal, Tripathi & Gupta, 2014).

Importance of IEC and BCC

Behaviour Change Communication (BCC) interventions are important in making the people aware, accept and use de-fluoridation technologies to make drinking water safe. BCC is also required to encourage people use safe water supplied under different water supply projects. Change in diet and nutrition supplementation play important role in fluorosis mitigation. In order to bring these changes by the affected population intense and continuous Information, Education and Communication (IEC) and Behaviour Change Communication (BCC) are required. Behavioral changes through appropriate IEC strategy is an important activity of fluorosis mitigation (MDWS, 2014). The diet/ nutrient counselling should promote message that for fluoride toxicity can be effectively tackled diet consisting of sufficient Calcium, Iron, Vitamin C, E and other antioxidants and also by avoiding fluoride contaminated food and beverages. Daily consumption of daily diet comprising vegetables and fruits rich in vitamins and other antioxidants, in a matter of a couple of weeks, can nullify the poisonous effect of fluoride with remarkable recovery (Susheela, 2003).

Massive awareness generation under Fluorosis Mitigation Program, in Khaira, a village in the district of Munger in the state of Bihar under safe drinking water campaign had been initiated in support of use of safe alternate drinking water sources. The intake of fluoride through drinking water became less but the existing fluoride deposits in the body through some other means can still be found in the excreted urine samples (KVSS, 2013). Hence there is a need for awareness creation about avoiding food and other materials which have high level of fluoride. It was recommended that there is need to add calcium rich food and vegetables in the menu of the *anganwadi* centers of Khaira village and schools. Awareness creation through periodical group meetings of the village women, in Mandla district in Madhya Pradesh, with the help of anganwadi workers and Female Health Workers for a period of three years helped increase in consumption of a locally available green plant called ‘Chakoda Bhaji’, which have calcium, vitamin C and iron, from

Behaviour Change Communication (BCC) interventions are important in making the people aware, accept and use de-fluoridation technologies to make drinking water safe. BCC is also required to encourage people use safe water supplied under different water supply projects.

once in a week to at least five times in a week. Myths related to occurrence of diarrhea due to consumption of this plant were removed. Nutritional intervention along with therapeutic supplementation of Calcium, vitamin C and iron revealed that there was a reduction in the prevalence (<20 years) of Genuvalgum from 51% at base line to 2.6% after intervention. Cases with mild fluorosis showed complete reversal of bone deformity, whereas partial reversal was observed in severe cases after intervention. This correction in the deformity was also detected radiologically (Chakma, 2016).

Continuous supervision and motivation of users of domestic and community based water filters to remove fluoride in three villages in Rampurhat Block I of Birbhum district of West Bengal reduced number of people using fluoride based toothpaste and drinking of black lemon tea. It also increased in number of people taking plenty of green leafy vegetables containing antioxidants. These behaviour changes resulted in significant decrease in percentage of people with symptoms of non-skeletal fluorosis such as pain in stomach and bloating or flatulence; constipation followed by diarrhea; polyuria and polydipsia, and fatigue or depression and muscle weakness and loss of appetite. Proportion of people with symptoms of skeletal fluorosis such as inability to touch the chin with chest; inability to bend to touch the toes, and inability to stretch the arm to touch the back of the head also showed a decline (Majumdar, 2011).

A number of earlier studies focused on prevalence and mitigation of dental and skeletal fluorosis information on non-skeletal fluorosis scarce. When detected early, measures to mitigate fluorosis can be undertaken to reverse the effects of non-skeletal fluorosis. This study contributes to the body of knowledge related to non-skeletal fluorosis and impact of IEC and BCC on its mitigation.

Research problems and methodology

Fluorosis mitigation in Tamil Nadu

A number of earlier studies focused on prevalence and mitigation of dental and skeletal fluorosis information on non-skeletal fluorosis scarce. When detected early, measures to mitigate fluorosis can be undertaken to reverse the effects of non-skeletal fluorosis.

There is no treatment available for severe cases of dental and skeletal fluorosis. However, it can be prevented by taking measures such as avoiding drinking water from fluoride contaminated sources; minimising consumption of food and other material rich in fluoride. Provision of safe drinking water, promoting appropriate nutrition and nutrition supplementation will help mitigating the effects of fluorosis. Tamil Nadu Water and Drainage (TWAD) Board taken up Hogenakkal Water Supply and Fluorosis Mitigation (HWS & FM) Project to provide sustainable safe drinking water to three Municipalities, 17 Town Panchayat and 6755 rural habitations in 18 Panchayat Unions in

Dharmapuri and Krishnagiri districts covering 33.87 lakh populations. The surface water is drawn from river Cauvery, flowing near Hogenakkal village. Centre for Symbiosis of Technology, Environment and Management (STEM) has supported the TWAD Board, over a period of five years 2010 to 2015, in implementing the Fluorosis Mitigation Component (FMC) of the HWS and FM Project.

HWS and FM project adopted a comprehensive Strategy 3 PHASE-3 APPROACH model.

APPROACH	**STAGE**		
	Capacity Building	*Survey & Lab Tests*	*Interventions*
School	• School teachers trained to identify dental fluorosis among students	•Teachers examine students for dental fluorosis • Collect and send water samples for lab analysis	Health education
Hospital	•Doctors trained to identify different types of fluorosis •Laboratories equipped with ion meters for testing fluoride content in water and urine samples	• Medical camps • Urine test • Radiological examination • Cosmetic interventions and • Corrective surgeries	•Health education •Individual counselling on nutrition •Supply of nutrition supplements to people with non-skeletal fluorosis
Community	•Village Voluntary Force (VVF) of local NGOs, Village Health Nurses (VHN) at Health Sub Centres trained to identify symptoms of fluorosis	•Household survey to identify people with symptoms of fluorosis •Water samples for lab analysis	•IEC activities on fluorosis symptoms and useful dietary changes • Group counselling on nutrition

This study pertains to the Information, Education and Communication and health education intervention on the people affected by non-skeletal fluorosis in two project districts. IEC involves educating the target groups by communicating information in a way in which they can understand. IEC aims at creating awareness and influence attitude and beliefs of selected audience, with respect to a health and related issues such as drinking water,

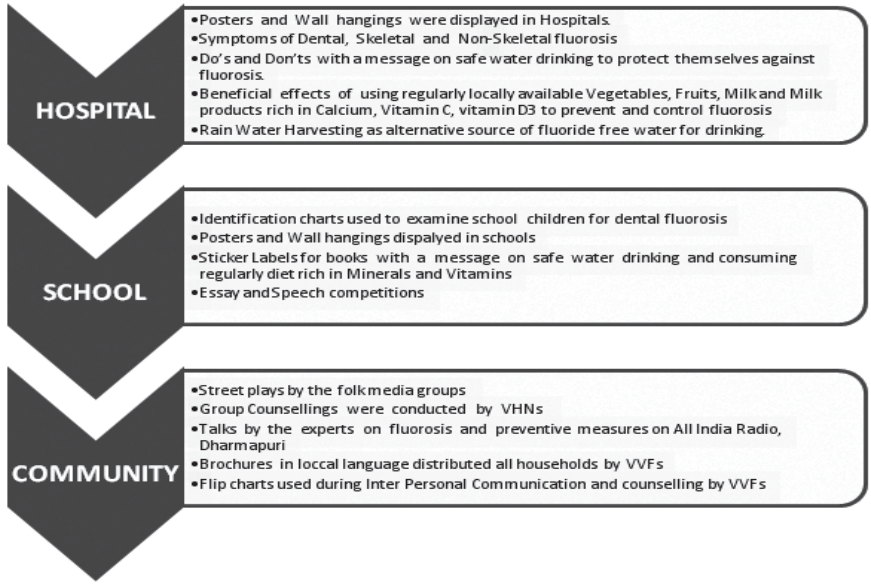
sanitation etc. Behaviour Change Communication (BCC) takes the impact of IEC by facilitating change in the behaviour of target groups. The following are the objectives of the IEC under the FMC of the project.

1. To create awareness among the community on ill effects of drinking high fluoride containing water.
2. To make known to the people that fluoride is the cause of Dental, Skeletal and Non-Skeletal fluorosis.
3. To motivate the people to drink safe (Hogenakkal) water regularly.
4. To educate the people on Rain Water Harvesting (RWH) as alternate source of fluoride free water.
5. To educate the people on beneficial effects of using regularly diet rich in Calcium, vitamin D3, Vitamin C and Anti-oxidants to antagonise the ill effects of fluorosis.
6. To create awareness on the ill effects of using fluoride rich black rock salt smeared pickles and black tea and motivate them to avoid.
7. To educate the people on hazardous effects of using paan, supari and arecanut which are rich in fluoride content.

IEC strategy

IEC strategy under FMC adopted an optimal mix of – a) mass communication; b) interpersonal communication and c) group approaches on preventive and control measures of fluorosis.

Figure 1: IEC and Health Education under Different Approaches



A Human Resource Development (HRD) approach was adopted for implementing the IEC strategy. IEC was included as a component of training manuals developed under the project. It was also included in the training schedule by training doctors (841 both government and private), teachers (3785), VHNs (418) and VVF (1887) on fluorosis mitigation to improve their skills with respect to understanding and using the IEC material effectively to bring about a change in knowledge, attitude and practices of the people and achieving the intended goals of the project.

Table 1: Print material developed under various approaches

School Approach	**No. of (Tamil)**	**No. of (English)**
Posters	5,000	500
Stickers	6,00,000	1,000
Fluorosis Identification Charts	3,500	500
Hospital Approach	**Tamil**	**English**
Fluorosis Identification Charts	500	1,000
Dos & Don'ts	3,000	1,000
Wall Hangings	4,000	500
Community Approach	**Tamil**	**English**
Fluorosis Identification Charts	2,500	1,000
Pamphlets (Brochure)	7,00,000	1,00,000
Posters	6,000	500
Flip Charts	2,500	1,000
Printing of Small Stickers	16,00,000	

This study presents – a) prevalence of non-skeletal fluorosis among the people in two districts under the HWS and FM project; b) the IEC and BCC interventions carried out and c) the impact of the BCC on non-skeletal fluorosis.

Materials and methodology

A household survey was conducted in all the habitations and all households

IEC was included as a component of training manuals developed under the project. It was also included in the training schedule by training doctors (841 both government and private), teachers (3785), VHNs (418) and VVF (1887) on fluorosis mitigation to improve their skills

of both the project districts covering a population of 6.62 lakh.

Table 2: Details of Household Survey and Population Covered

S. No.	Unit	District		Total
		Dharmapuri	Krishnagiri	
1	No. of the Blocks	8	10	18
2	No. of House-holds	307944	359280	667224
3	Population • Males • Females	1209730 629835 579895	1452555 752376 700179	2662285 1382211 1280074

Data analysis and implications

Prevalence of non-skeletal fluorosis

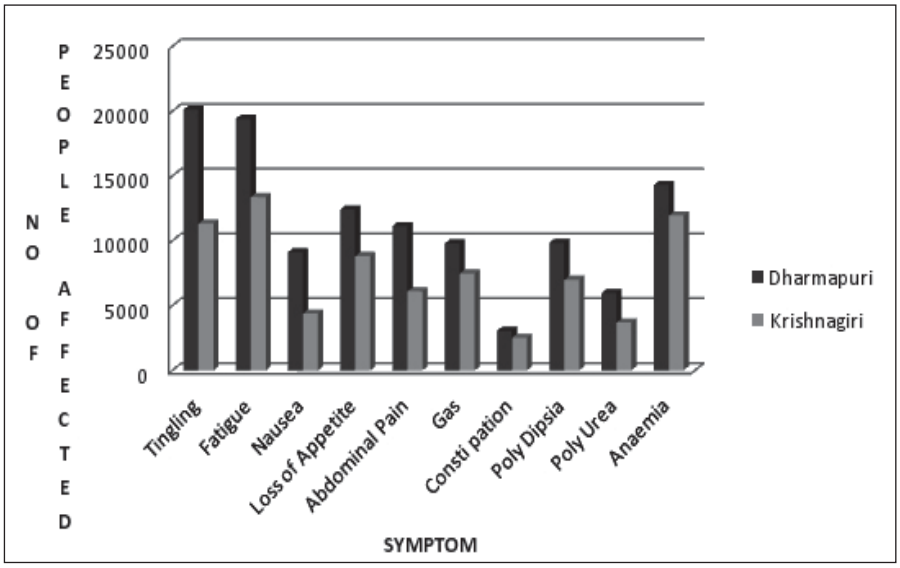
The household survey generated data on prevalence of all three forms of fluorosis namely – a) dental fluorosis; b) skeletal fluorosis and c) non-skeletal fluorosis. In this study data pertaining to non-skeletal fluorosis and impact of project interventions, especially communication interventions are presented. In case of non-skeletal fluorosis data on occurrence of the following symptoms was generated with the help of a questionnaire.

1. Tingling
2. Fatigue
3. Nausea
4. Loss of appetite
5. Abdominal pain
6. Gas
7. Constipation
8. Polydipsia
9. Polyuria and
10. Anaemia

The household survey generated data on prevalence of all three forms of fluorosis namely – a) dental fluorosis; b) skeletal fluorosis and c) non-skeletal fluorosis.

Non-skeletal fluorosis was reported by 7.21% of the population surveyed. Proportion of people affected in Dharmapuri 4.3% is higher compared to 2.9% Krishnagiri. Tingling, fatigue and anaemia are the three most frequently reported symptoms of non-skeletal fluorosis.

Figure 2: Prevalence of non-skeletal fluorosis - by Symptom



Out of all the different age groups, 3.7% in the age group of 19-45 is affected with non-skeletal fluorosis followed by 1.5% in the age group of 46-60. Out of non-skeletal affected population, the female population (4.1%) is more affected with non-skeletal fluorosis than the male population (3.1%) in both the districts.

Table 3: Prevalence of non-skeletal fluorosis – by gender and age group

District	Gender	Age Group (years)					Total
		1-12	13-18	19-45	46-60	> 60	
Dharmapuri	Female	7106	5685	26871	10795	4884	55341
	Male	7904	6736	33281	8003	3911	59835
Krishnagiri	Female	674	1050	30043	13532	7326	52625
	Male	596	550	8958	7745	6164	24013
Total	Female	7780	6735	56914	24327	12210	107966
	Male	8500	7286	42239	15748	10075	83848
Grand Total		**16280**	**14021**	**99153**	**40075**	**22285**	**191814**

Analysis of urine samples

The households with more than 60% of the members affected and persons with more than three to four symptoms related to non-skeletal fluorosis were

selected for study of impact of interventions. As the symptoms related to non-skeletal fluorosis and early skeletal symptoms could be reversed in a short period of 3 weeks to 8 months by adopting safe water drinking practices and regular use of diet rich in micronutrients as explained above.

As per house to house survey by the village volunteers 39,800 persons in both the districts with various symptoms related to non-skeletal fluorosis were selected for the purpose of impact study. In order to confirm the provisional diagnosis based on the symptoms, urine samples of all the suspected persons were collected and analysed for fluoride level. Those persons with fluoride level more than normal range of 1.0mg/l were selected for study of impact of interventions.

Table 4: Fluoride levels in urine samples of people affected by non-skeletal fluorosis

S. No.	District Name	Number of samples examined	Fluoride level	
			Below 1 Mg/L	More than 1 Mg/L
1	Dharmapuri	16207	4049	12158
2	Krishnagiri	12256	4356	7900
	Total	28463	8405	20058

Change in behaviour

The impact of IEC and BCC activities was assessed based on 1014 people from Krishnagiri block in Dharmapuri district and 651 people Shoolagiri block in Krishnagiri district who exhibited non-skeletal fluorosis symptoms and with urine fluoride level was more than 1mg/l. Change in the behaviour of people with respect to – a) drinking water source; b) diet rich in micronutrients; c) consumption of fluoride rich items is presented below. The impact of these behaviour changes on – a) urine fluoride level and b) reduction in symptoms of non-skeletal fluorosis are also presented.

Drinking water source

Prior to Hogenakkal Water Supply all the residents were drinking pipe water supplied by the panchayat and other ground water sources. Subsequent to supply of water through Hogenakkal Water Supply Project, all persons affected with non-skeletal fluorosis switched to this safe water source.

Table 5: Change in use of drinking water sources

S.No.	Source of water	Number of people			
		Krishnagiri block		Shoolagiri block	
		Baseline	*After 3 months*	*Baseline*	*After 3 months*
1	Pipe	1014	0	651	0
2	Tubewell	417	0	227	0
3	Drawwell	17	0	11	0
4	Others	31	0	3	0
5	Hogenakkal	0	1014	0	651

Consumption of food rich in micronutrients

Milk, Curd and Green leafy vegetables, especially drumsticks which are commonly used daily by the residents are rich in calcium and other micronutrients and are of great help in minimising the ill effects of fluorosis. The seasonal fruits like guava, orange, mango and tapioca rich in vitamin-C and other anti-oxidants are also of great help in antagonising the ill effects of fluorosis. Impact of the sustained health education and IEC and BCC activities on people with non-skeletal fluorosis was assessed in terms of change in consumption of food items rich in calcium and other micro-nutrients.

Table 6: Increase in consumption of food items rich in calcium and other micro nutrients

S.No.	Diet rich in micro nutrients	Number of people			
		Krishnagiri block		Shoolagiri block	
		Baseline	*After 3 months*	*Baseline*	*After 3 months*
1	Milk	886	1014	396	618
2	Curd	828	1010	382	543
3	Green Leafy Vegetables	886	995	375	593
4	Drumstick	886	995	431	542
5	Guava	846	804	182	357
6	Amla	227	790	211	574
7	Orange	486	964	225	574
8	Tapioca (Kilangu)	217	790	136	215

Though many people reported to be using milk regularly, they may be using in the form of coffee or tea. Hence they should be encouraged to use milk directly, especially children to whom it will be of great help since the milk is rich in calcium content.

Consumption of fluoride rich items

Due to individual counselling during house to house survey and also IEC activities through mass media and group counselling, there was a substantial decline in habits like drinking black tea and chewing tobacco, areca nut, supari and paan, items which contains high level of fluoride in both blocks of the district.

Table 7: Reduction in consumption of food items rich in fluoride

S.No.	Name of fluoride rich item	Number of people			
		Krishnagiri block		Shoolagiri block	
		Baseline	*After 3 months*	*Baseline*	*After 3 months*
1	Black Tea	427	21	98	12
2	Tobacco	711	114	607	107
3	Supari				
4	Areca nut				
5	Paan				

Symptoms related to non-skeletal fluorosis

Change in drinking water source, increased consumption of diet rich in calcium and other micronutrients and reduction in consumption of fluoride rich items, due to sustained and targeted IEC and BCC interventions, resulted in decrease in symptoms of non-skeletal fluorosis.

Table 8: Reduction in symptoms of non-skeletal fluorosis

S.No.	Symptom	Number of people			
		Krishnagiri block		Shoolagiri block	
		Baseline	*After 3 months*	*Baseline*	*After 3 months*
1	Tingling & Numbness	796	310	524	157
2	Fatigue & Weakness	935	351	459	123
3	Nausea	786	228	389	100
4	Loss of Appetite	772	263	422	385
5	Pain in Abdomen	886	173	288	103

6	Gas formation & Bloating of Stomach	688	168	447	238
7	Constipation	541	169	193	104
8	Poly Urea	551	95	172	92
9	Polydipsia	603	333	324	257
10	Anaemia	822	787	373	206

Urine fluoride levels

The reduction in non-skeletal fluorosis is also accompanied by a change in fluoride level in the urine samples of the people affected people.

Table-9: Change in fluoride levels > 1 mg/l in the urine samples of people affected with non-skeletal fluorosis

S.No.	District	Number of people	
		Baseline	*After 3 months*
1	Krishnagiri	1014	238
2	Dharmapuri	651	243

Conclusions

The IEC and BCC interventions in two districts of Dharmapuri and Krishnagiri districts in Tamil Nadu have been successful in bringing in behaviour change – a) with respect to drinking water from safe sources; b) increase in consumption of diet rich in calcium and other micronutrients and c) reduction in consumption of items rich in fluoride. Such behaviour changes have been effective in reducing the symptoms of non-skeletal fluorosis, accompanied by change in fluoride level in urine samples of these people.

Limitations

The household health survey was by the Village Volunteers identified by the NGOs of the concerned blocks, who are not medically qualified. All of them are provided two days training on identification of persons with skeletal and non-skeletal fluorosis based on the symptoms expressed by the persons affected and entered in the survey questionnaires.

Conflict of interest

The project under which these interventions were carried out by STEM was

funded by the Tamil Nadu Water and Drainage Board and supported by the Japan International Cooperation Agency (JICA).

References

Chandrasekhar, J., Thankappan, K.R., & Sundaram, K.R. (2010). Severe dental fluorosis and jowar consumption in Karnataka, India. *Community Dent Oral Epidemiol*, *38*(6),559-67. doi: 10.1111/j.1600-0528.2010.00564.x.

Chakma, T. (2016). Fluorosis Mitigation through Nutrition supplementation and food diversification and safe drinking water in Madhya Pradesh. *NIRTH Update, 1*(1), 2-3. Retrieved from http://www.nirth.res.in/publications/update/may_2016.pdf

DGHS Report (2014). *National Programme for Prevention and Control of Fluorosis (NPPCF)* [Revised Guidelines (2014)]. Directorate General of Health Services, Ministry of Health & Family Welfare, Government of India. Retrieved from http://www.mohfw.nic.in/WriteReadData/l892s/569857456332145987456.pdf

Gopalakrishnan, S.B., Viswanathan, G., & Ilango, S.S. (2012). Prevalence of fluorosis and identification of fluoride endemic areas in Manur block of Tirunelveli District, Tamil Nadu, South India. *Appl Water Sci*, *2,* 235–243. doi: 10.1007/s13201-012-0043-4.

KVSS (2013). *Integrated approach to fluoride management in Khaira village, Munger* [Project Report]. Kalpwraksh Seva Sansthan and B-TAST, Patna, Bihar, India. Retrieved from http://www.indiawaterportal.org/sites/indiawaterportal.org/files/final_report_khaira_1_0.pdf

Lakshmi, V. (2013). Fluoride intake, diet and health status of children residing in low endemic fluoride afflicted areas of Chittoor district. *International Journal of Scientific Engineering and Research*, *1*(4). Retrieved from http://www.ijser.in/archives/v1i4/SjIwMTM4MA==.pdf

Majumdar, K.K. (2011). Health impact of supplying safe drinking water containing fluoride below permissible level on fluorosis patients in a fluoride-endemic rural area of West Bengal. *Indian Journal of Public Health*, *55*(4), 303-308. Retrieved from http://www.jfmpc.com/temp/JFamMedPrimaryCare2174-1636195_002716.pdf

NEERI (2007). *Integrated Fluorosis Mitigation*. Guidance Manual [National Environmental Engineering Research Institute, Nagpur; United Nation's Children Fund, Bhopal; Regional Medical Research Centre for Tribals (ICMR), Jabalpur and Public Health engineering Department, Bhopal]. Retrieved from http://www.ircwash.org/sites/default/files/Devotta-2007-Integrated.pdf

Park, K. (2011). *Park's text book of preventive and social medicine*. India: Banarasisdas Bhanot Publishers.

PSI (2011). *A Report on Fluorosis mitigation program in Dhar District (M.P.)* [A Joint Study by People's Science Institute, Dehradoon Vasudha Vikas Sansthan (Dhar) Water Aid, India]. Retrieved from http://www.indiaenvironmentportal.org.in/files/file/fluorosis_mitigation_dhar_district_psi_2011.pdf

Ranjan, S. & Yasmin, S. (2015). Amelioration of fluoride toxicity using amla (Emblica officinalis). *Current Science*, *108*(11), 2094-98. Retrieved from http://www.currentscience.ac.in/Volumes/108/11/2094.pdf

Sapur, S. (2012). Strategies of sustainable nutrition to address fluorosis and malnutrition in children. *Water Policy Research Highlight-41* [IWMI-Tata Water Policy Program].

Susheela, A.K. (2003). *Strategy for fluorosis mitigation program in India*. Retrieved from http://www.de-fluoride.net/4thproceedings/129-137.pdf

Susheela, A. K., Mondal, N. K., Tripathi, N., & Gupta, R. (2014). Early diagnosis and complete recovery from fluorosis through practice of interventions. *Journal of the Association of Physicians of India*, *62*, 572-79. Retrieved from http://www.japi.org/july_2014/04_oa_early_diagnosis_and.pdf

Susheela, A.K. & Mudgal, A. (1999). Flouride in water: An overview. *Water Front*. *13*. Retrieved from https://www.unicef.org/wash/files/wf13e.pdf

WHO (2010). *Inadequate or excess fluoride: A major public health concern*. Switzerland: World Health Organisation. Retrieved from http://www.who.int/ipcs/features/fluoride.pdf?ua=1

Mapping the Coverage of Defence Science & Technology in the Indian Press

An Analysis of Thirteen English-language dailies published from Delhi

Phuldeep Kumar[1]

1 Scientist D, Defence Scientific Information & Documentation Centre (DESIDOC), Defence Research & Development Organisation (DRDO), Metcalf House, New Delhi, India.
E-mail: phuldeep@gmail.com

Abstract

The press being the fourth pillar of democracy has been endowed with responsibility of informing, educating, entertaining, and motivating the public. It acts as bridge between government and public, and vice versa. This function of press has been examined in limited context of defence science and technology (DST) coverage by English-language dailies published from Delhi in this study. Content analysis of thirteen English-language newspapers has been done to unravel the actual state of affairs. The coverage has been found to be abysmal when we consider that close to 2.3% of GDP is being spent on defence in India.

Keywords

Defence journalism, Content analysis, Science communication, Defence science and technology, English dailies

India since its independence has constantly faced aggression from its hostile neighbours. Indian boundaries have not seen a full-fledged war since 1971 war with Pakistan, which resulted in formation of a new country Bangladesh. The last 46 years without a full fledged war doesn't mean that neighbours have been friendly, but it is because India has consistently and effectively improved its defence mechanisms. The hard reality of this modern world is the stronger you are; more peaceful will be the borders. According to SIPRI report 2016 India is spending 2.3% of GDP on defence. India is a big country, sharing border with many countries, and also has a big coastline to guard. Hence, it has to have all forms of defence, i.e. Army, Navy, and Air Force. India has third largest army in the world in terms of manpower. India is being consistently rated among top six militaries around the world in various SIPRI reports (2011 to 2016). There is popular support among the masses to have a strong defence mechanism, given the history. Political leadership has always been responsive in matters of defence.

In India English-language press seems to attract more advertising revenues. This is so because they cater to the elite and middle class of India. They publish more number of pages per issue. Quality of printing and paper is also better as compared to the vernacular press. They also perform agenda setting function for Indian press. Vernacular press seems to follow the prominent issues raised by English press. It must be added here that the Indian vernacular press too has been improving leaps and bounds. Every circulation audit of Indian newspapers is showing impressive gains by vernacular press.

In this context, how Indian press is covering defence science and technology (DST), would be interesting to know. The English language press with its deep pockets and with the best journalists on the payroll does merit a look. In this study various facets of DST coverage have been looked into to unravel the actual state of affairs. In this study DST news includes plain news reports of defence, reports about science and technology involved in weapons, interviews of defence scientists and defence strategists, politics of defence, geopolitical news, analysis of strategic equations, comparisons of armoury of different countries, news and views about defence personnel.

Review of literature

Content analysis is purposive analysis of a communication medium content with predetermined unit of analysis and variables. It conforms to scientific methods of enquiry, it is objective, systematic, and can be generalised. It is a research method whereby replicable and valid inferences from data to

their context can be made. Understanding can be developed on the basis of explicit rules (Krippendorff, 1980; Berelson, 1952; Weber, 1990; Prasad, 2008).

Nelkin (1987) has emphasised on importance of newspapers as an important service of information for all around the world, and for some it is the only source of information. Science stories need space as they require some explaining along with the news. Various media have their own virtues, among TV, Radio, and newspapers; the newspapers offer maximum space for science to be told.

According to Schafer (2012), science coverage by press involves three frames: The scientific frame (it involves scientific methods, principles, and processes); the political frame (it involves political, judicial, regulatory, and people participation aspects); and the economic frame (it involves monetary deliberations, such as, profits, generation of employments impacts on stock market, etc).

Science and technology involves a gamut of sub-disciplines and not every aspect of it can be covered by press. As newspapers choose stories based on news value (proximity, human interest, cause and effect, novelty, probability, controversy, economic gain), hence news which would have wider impact on society as a whole gets more attention, and consequently are more published. Many previous studies have found a clear inclination of newspapers around the world towards health and medicine issues. For vast majority of world traditional media such as newspapers are vital sources of information and in a developing country like India it is even more true. (Nelkin, 1995; Bucchi & Mazzolini, 2003; Pellechia, 1997; Rosen, et al 2016; Dunwoody & Peters, 1992).

Coverage of science in newspapers is also affected by events such as National Science Day, National Technology Day, World Environment Day, etc. As on such days many functions are organised and many press releases reach the newspaper offices. Also some controversy or public debate issue such as genetically modified seeds many prop up science coverage in newspapers (Miller, 1999).

Dutt and Garg (2012) while studying science coverage by Indian newspapers found that defence science and technology occupied 2.5% of the space occupied by all the science related stories. Though, in DST category 21.42% news items were international. This is abysmal coverage considering that overall science coverage itself was found miniscule.

Arulchelvan (2010) has studied four Tamil newspapers regarding their science and technology coverage. These newspapers were Dinamani, Dinamalar, Daily Thanti, and Dinakaran. The period of study was March to May 2008. A total of 1078 items were found, 3.5% coverage of S&T was found overall. Health items were 338 (31.35%), Agriculture items were 240(22.26%), and computer related news were 218 (21.52%). The tone was positive (60.95%), neutral (31.45%), and negative (7.79%). The origin of these items were foreign (52.13%), Tamil Nadu (33%), and rest of India (17.44%). Around 70 % of news was sourced from news agencies and rest 30% by their own reporters.

Puri (2006) in his study analysed 28 newspapers for their coverage of science and technology. It included 19 Gujarati, three Hindi, and two English newspapers. The duration of the study was 18 October 2002 to 20 January 2003. A total of 1926 copies were analysed. In 7.5% of the cases newspapers did not cover any S&T news. Newspapers generally printed short stories on science and technology. On an average four items were covered every day. Medicine and health was most covered area in S&T. Among Gujarati newspapers it was 48.9%, Hindi newspapers it was 39%, and English newspapers it was 30%. The foreign news appeared more in English newspapers. Most favoured format was news (65%), followed by articles (29%).

Kumar (2013) studied newspapers published from Kerala regarding their science coverage during 2010. A total of six Malayalam newspapers and two English newspapers were studied. The Malayalam newspapers were: *Malayala Manorama, Mathrubhumi, Kerala Kaumudi, Madhyamam, Deshabhimani*, and *Janamabhumi*. The English newpapers were *New Indian Express* and *The Hindu*. A total of 1.05% science news coverage overall was found among Malayalam newspapers. A total of 0.7% science news coverage overall was found among English newspapers. The Hindu was better in English category and Deshabhimani was the best amongst Malayalam category. In terms of priority of areas health, agriculture, and environment were the leaders.

Bucchi and Mazzolini (2003) analysed a leading Italian newspaper over a period of 50 years. They concluded that science reporting has increased over the period. Biomedical issues dominated the discourse in comparison to other fields. Scientists have also started to contribute general articles in newspapers. Length of articles has increased, more illustrations are being published. A general and increasing tendency to represent science as uncontroversial has been found. The articles published generally quote

Puri (2006) in his study analysed 28 newspapers for their coverage of science and technology. In 7.5% of the cases newspapers did not cover any S&T news. Medicine and health was most covered area in S&T.

single sources like research institutes, universities and science academics.

Schafer (2009) has done a meta analysis of studies on the media's coverage of science from 1956 onwards. It has been reported that there has been a significant increase in reporting about science 1990 onwards, before that very few articles appeared in media. The natural science (biology, medicine, climate, etc) occupied lion's share of science reporting. In terms of continents where content analysis of media is most pursued Europe (54.7%), and North America (40%) consumes almost all studies. Asian countries lagged abysmally in such studies with only 0.4%. Among countries USA media is most analysed with 37.3% of the total. At second position is United Kingdom with 24.7% of the total. Print media was the most analysed media with 78.7% of all the media analysis. In print media newspapers alone account for 57% of the content analysis done.

Kumar and Kumar (2016) while studying specific coverage of DST in thirteen English-language newspapers have reported that it is miniscule.

Research design and methodology

Content analysis is similar to data mining. It uses both qualitative and quantitative methods to make valid inferences from given information. It is objective, systematic, replicable, and valid. Qualitative content analysis is used to examine the differences between latent and the manifest content (Guillaume & Bath, 2008). Thirteen English-language national dailies published from Delhi, India with wide circulation base were selected for this study. These newspapers are also the most resourceful, therefore, have wider coverage of news and perform agenda setting function, which is also followed by other small newspapers (Vilanilam, 2005). These newspapers are representative of broader national consensus view on multidimensional aspects of DST. The newspapers are Business standard, Deccan Herald, Daily News Analysis (DNA), The Hindustan Times, Mail Today, The Hindu, The Economic Times, The Indian Express, The Times of India, The Pioneer, The Tribune, The Statesman, and The Asian Age. The period of study is entire month of May 2013. All these newspapers were manually read for DST related news, editorials, views, and opinions on daily basis. The political, social, economical, and scientific aspects of defence and national security are included in studying coverage of defence science and technology. Quantitatively for each news item, the data regarding: date of publication, newspaper in which the item appeared, weekday of publication, news item format, number of words in each news item, and presence of illustrations were coded using the code book. Qualitatively each news item was analysed

Schafer (2009) has done a meta analysis of studies on the media's coverage of science from 1956 onwards. It has been reported that there has been a significant increase in reporting about science 1990 onwards, before that very few articles appeared in media.

to ascertain source of news item, area of coverage, approach, presentation, bias, subject of news item, and level of reporting were coded. The census method was adopted, i.e., every news item meeting the set criteria was coded. The data so gathered has been put through SPSS software. The similar news item appeared in more than one newspaper were discarded. Only one news item was retained.

Result

A total of 251 news items during the sample period (31 days) were found in all thirteen English language-newspapers under this study, which pertained to defence science and technology and its various dimensions. The results obtained after collection and compilation of data, and feeding it in SPSS software are as follows.

Occurrence of defence science and technology news (Newspaper-wise)

News related to defence science and technology in all forms of framing are selected and tabulated newspaper-wise. The genre of these newspapers is also slightly different. Mail Today and DNA are entertainment oriented papers. Business Standard and The Economic Times are papers with focus on reporting of dynamics of markets and economy. The Asian Age is an international newspaper published from Delhi. Rest are national newspapers covering every aspect of human interest. Given the priorities of these newspapers as different, so it is expected that national newspapers would be covering more of DST. The results though are not in conformity to the expectations.

Among these newspapers, The Tribune covered 38 stories which is 15.1% of the overall news covered in all the newspapers. At second place is The Times of India with 30 stories which is 12.0% of the total news covered. At third place is The Indian express with 27 news stories, i.e. 10.8% of the total news covered. DNA didn't even publish a single story in this period. Among the newspapers which gave poor coverage to DST are The Economic Times with 08 news stories, i.e. 3.2% of the total, The Statesman with 09 stories, i.e. 3.6% of the total comes third from the bottom. Mail today comes fourth from the bottom with 11 news stories, i.e. 4.4% of the total, which is better than The Statesman. The average news story published per newspaper per day is 0.62 (Table 1).

Table 1: Occurrence of defence science and technology news (Newspaper-wise).

Sr.	Newspaper	Number of news items	Percentage (%)
1.	Mail Today	11	4.4
2.	Business Standard	14	5.6
3.	The Economic Times	8	3.2
4.	The Hindu	26	10.4
5.	The Indian Express	27	10.8
6.	The Times of India	30	12.0
7.	The Pioneer	26	10.4
8.	The Tribune	38	15.1
9.	The Hindustan Times	26	10.4
10.	Deccan Herald	12	4.8
11.	The Asian Age	24	9.6
12.	The Statesman	9	3.6
13.	DNA	0	0
	Total	**251**	**100.0**

Specific topic of the news

A very few journalists covering science have formal education in science (Palen, 1994). At editorial level the situation is more or less same (Dubas & Martel, 1975). Encouragingly a new breed of science reporters is cropping up, though slowly and sparsely (Weigold, 2001). In Indian context both specialised science journalists and generalists are writing for defence science and technology content. The selection criteria of science journalists is different from other beat journalists (Artz & Wormer, 2011), here the specific topics/actors covered by Indian English-language press are enlisted. All the news items were read manually to find the specificity.

Most stories were about China, which was 29.9% of the total news items published. Defence related coverage got the second most attention of the journalists with 7.6% of the total news items published. News related to Navy got the third most attention with 7.2% of the total news items published. Among Indian defence PSU's, Defence Research and Development Organisation (DRDO) got most coverage with 12 stories published (4.8%). Indian Air Force also got very good coverage with 11 stories published (4.4%).During this period press has been found to have given attention to

national and international issues related to DST as mentioned in Annexure 1.

Weekday wise distribution

Among the traditional media, newspapers are most suited to report science, as they have lesser space constraints compared to Radio and TV (Nelkin, 1995). Indian English-language newspapers carry more number of pages in their Sunday editions. Hence, it is expected that DST coverage would be more on Sundays but no such correlation is found in this study. The results were contrary to the view, most DST related news stories were published on Thursday (20.7%) of the total news stories published. This was followed by Wednesday (19.1%) and Tuesday (15.1%).The least news related to DST was found on Saturdays (8.4%) (Table 2).

Table 2: Weekday wise distribution

Weekday	Number of News Item	Percentage (%)
Monday	29	11.6
Tuesday	38	15.1
Wednesday	48	19.1
Thursday	52	20.7
Friday	37	14.7
Saturday	21	8.4
Sunday	26	10.4
Total	251	100.0

Format of the news items

Newspapers published news items in various formats, viz. news reports, editorials, articles, interviews, pictorials and analysis. Among these formats articles and analysis have the widest opportunity to explain the science behind the defence weapons. Interviews can provide insights directly from the scientists and technologists. News reports are often based on press releases from defence organisation (Weigold, 2001). The pictorials are the most effective in terms shortly explaining the technical attributes of a weapon. News stories of all thirteen newspapers were quantified among these categories. It is evident that favourite form of reporting is in news form with 49.0% of the total items published. This was followed by the articles with 31.1% of the total items published and the analysis with 17.5% of the total items published. Only two editorials appeared about DST and only four interviews were published. No pictorial was published at all (Table 3).

Table 3: Format of the news item

Format	Number of News Items	Percentage (%)
News/report	123	49.0
Article	78	31.1
Analysis	44	17.5
Editorial	2	0.8
Interview	4	1.6
Pictorial	0	0
Total	251	100

Approach towards news item

Hartz and Chappel (1997) suggests that a very few journalists understand the nuances of scientific method, the peer review system, and the reasons for linguistic precision scientists employ when speaking about their work. The result here confirms the above statement in the Indian context, only 25 news items, i.e. 10% of the total items published have some sort of inkling towards science. Rest are reported in the form of plain news (Table 4).

Table 4: Approach towards news item

Approach	Number of News Items	Percentage (%)
Scientific	25	10.0
General	226	90.0
Total	251	100.0

Way of presenting the news item

Fischhoff (2013) suggested a template for good science communication. It involves four tasks. Firstly, identify the issues relevant to the people. Secondly, determine what people already know. Thirdly, try to fill the gap between what is known to people and what needs to be told to people. Fourthly, constantly evaluate the adequacy of the communication effort to improve next time. Here 67.3% of the total news items published were just informative, i.e. no specific efforts were made by the journalists to employ the above tricks. In 32.7% of the cases though, such attempts seems to have successfully made by the journalists (Table 5).

Table 5: Way of presenting the news item

Presentation	Number of News Items	Percentage (%)
Interesting	82	32.7
Just informative	169	67.3
Total	251	100.0

Overall bias towards defence science and technology

The coverage of science by press in the past was criticised for being critical and technophobic (Homberg, 1987; Kepplinger, 1989), in recent times the opposite is true; coverage is too supportive and is being criticised for it. This tendency seems to be growing (Bauer, et al 1995; Elmer et al. 2008). Summ and Volpers (2015) reported that science coverage of German press is in neutral style and is fact-oriented. In present study the coverage of DST is predominantly neutral with 56.2% of total news items published. It has been positive in 31.5% of the cases. The negative tendencies (the news items critical of defence acquisitions; questioning of defence expenditure; finding faults in weaponary) were in 12.4% of the cases (Table 6).

Table 6: Overall bias towards defence science and technology

Bias	Number of News Items	Percentage (%)
Positive	79	31.5
Negative	31	12.4
Neutral	141	56.2
Total	251	100.0

Source-wise distribution of news items

Newspapers may gather news from media agencies, their own correspondents, press releases sent to them directly, and through sourcing from competitive media. Defence is an area under veil of secrecy; journalists can't go in their free will. This makes getting defence news tough. Journalists' prime source of information are press releases from defence departments.

This is also evident from this study that 45.0% news published without byeline. Most news appeared by name (54.6%), were published by journalists who predominantly cover defence. These journalists gather information from various sources and present them with their inputs in exhaustive way. Only one news report was found from the news agency. (Table 7).

Table 7: Source-wise distribution of news item.

Source	Number of News Items	Percentage (%)
By name	137	54.6
Staff reporter	0	0
Agency	1	0.4
Not mentioned	113	45.0
Total	251	100.0

The coverage of science by press in the past was criticised for being critical and technophobic (Homberg, 1987; Kepplinger, 1989), in recent times the opposite is true; coverage is too supportive and is being criticised for it.

Author-wise distribution of the news item

As more than half the news stories about DST were published by name, here the number of news stories published by individual journalists is quantified (see Annexure 2). It was found that Rajat Pandit and Ajai Shukla have been the most active journalists with seven news stories each, i.e. 2.8% of the total followed by Rahul Singh (2.4%) and Ajay Banerjee (2.4%). 55 individual journalists have written one news story each. Two news stories each has been written by 12 individual journalists. Three news stories each has been written by four journalists. More than two stories each have been published by 12 journalists. These can be considered as defence journalists. Eight foreign journalists have also found to have published defence news. This also exposes the fact that in India there are few journalists who have some expertise in defence.

Main actor/subject of news item

While quantifying the news they were grouped in four broad categories. Equipment category includes news which talks about a specific weapon, facility and organisation. In human resource category news which involve talks with scientists and defence personnel were clubbed. In government policy category news which talk about budget, finance, FDI, privatisation, etc. were clubbed. In geopolitical category the news which involves analysis of more than one country were taken. The majority of news focused on geopolitical strategic equations (48.6%). The news about equipment/product (36.3%) comes second. The evaluation and reporting of government policy regarding DST is at 10.4%. The people involved in defence research and development, production, active personnel, maintenance, and use were very less reported about, only 4.8% coverage was found (Table 8).

While quantifying the news they were grouped in four broad categories. Equipment category includes news which talks about a specific weapon, facility and organisation. In human resource category news which involve talks with scientists and defence personnel were clubbed.

Table 8: Main actor/subject of news item.

Main Focus	Number of news items	Percentage (%)
Equipment/product	91	36.3
Human Resource	12	4.8
Government policy	26	10.4
Geopolitical	122	48.6
Total	251	100.0

Level of reporting

There can be four levels of reporting in press viz., international, national, regional, and local. Defence as such is an area of national importance and international ramifications. It has been found that only 3.6% of the total news

was covered at regional level and were mainly about defence exhibitions. Majority of the reporting was found either at national or international level. The national level reporting was at 65.3% and international level reporting was 31.1% (Table 9).

Table 9: Level of reporting

Level of Reporting	Number of News Items	Percentage (%)
National	164	65.3
International	78	31.1
Regional	9	3.6
Total	251	100.0

Depth of news coverage Newspaper-wise

Depth of news coverage can best be gauged from number of words published in a particular news story. The mean value of The Economic Times is highest (853 words). This is followed by The Tribune (671.95 words) and The Hindu (661.36 words) respectively. The least mean value is of Mail Today (319.55 words). This is followed by Deccan Herald (390.64 words) and The Hindustan Times (406.58 words). The median value is highest for The Tribune (671.95 words). The median value is lowest for Mail Today (253 words). The shortest story was published in The Pioneer (34 words). The biggest story was published in The Hindu (3730 words). The standard deviation was highest for The Economic Times (808.804 words). The standard deviation was least for Deccan Herald (151.899 words) (Table 10).

Table 10: Depth of news coverage Newspaper-wise

Newspaper	N	Mean	Median	Minimum	Maximum	Std. Deviation
Mail Today	11	319.55	253.00	68	961	270.600
Business Standard	14	627.14	584.00	247	1504	301.024
The Economic Times	8	853.00	570.00	217	2418	808.804
The Hindu	26	661.36	515.00	211	3730	683.095
The Indian Express	27	458.52	431.00	134	1140	228.406
The Times of India	30	420.07	432.00	195	831	153.709
The Pioneer	26	563.46	413.50	34	1790	413.086
The Tribune	38	671.95	527.00	135	1914	426.835
Hindustan Times	26	406.58	314.00	200	916	222.799
Deccan Herald	12	390.64	413.00	105	652	151.899
The Asian Age	24	472.83	277.50	71	1130	346.001
The Statesman	9	584.00	553.00	192	1363	366.084
DNA	0	--	--	--	--	--
Total	251	531.29	428.00	34	3730	401.252

Newspaper-wise distribution of journalists

The number of news stories published by name of journalists is more than half of the total news stories published. Maximum journalists were found to be writing for The Tribune. Ten journalists each have written for The Times of India and The Hindustan Times. Only one journalist has written for Business Standard (Table 11).

Table 11: Newspaper-wise distribution of journalists

Mail today	Gautam Dutt, Kanwal Sibal, Kartikeya Sharma, Rohan Venkatramakrishnan, Shiv Arora
Business standard	Ajai Shukla
Economic times	Alexander Tomas, Arten Zagarodnov, Sruthijit K K
The Hindu	Ananth Krishnan, B Muralidhar Reddy, G,Srinivasan, Madhumati D.S., Manoj Joshi, Sandeep Dikshit, Vinay Kumar
The Indian express	Anchal Dhar, David E Sangerl & Nicole Perlorth, Manu Pubby, Pranab Dhal Samanta, Robert M Hathaway, Sam Roggeveen, Shubhajit Roy
The Times of India	Chiadanand Rajghatta, Josy Joseph, Rajat Pandit, Rajat Pandit & Sanjay Dutta, Rajeev Deshpande, Sachin Parashar, Saibal Dasgupta, Srikanth Kondapalli, Srinivas Laxman, Vishwa Mohan
The Pioneer	Ashok K Mehta,Claudi Arpi,Kumar Chillappan,Pravin Sawhney,Rahul Dutta,S Rajagopalan,Sachin Parashar,Saibal Dasgupta,Sandhya Jain,Vipin Malik
The Tribune	Ashok Tuteja, Brig Arun Sehgal, Gurmeet Kanwal, Harsh V Pant, Inder Malhotra, Kuldip Nayar, Man Mohan, P Stobdan, Raj Chengappa, Shyam Saran, Umesh Dewan, Vijay Mohan, Zorawar Daulet Singh
Hindustan Times	Brahma Chellaney, J Shanmugha Sundram, Jaynath Jacob, Moushmi Dasgupta, Pramit Pal Chaudhuri, Rahul Singh, Rahul Singh & Jaynath Jacob, Rubla Singh, Shishir Gupta & Pramit Pal Chaudhuri, Sutirtho Patranobis
Deccan herald	Kalyan Roy, Zulfikar Majid
Asian age	Aun Kumar Singh, Ashok K Mehta, Vharat Karnd, KC Singh, Lalit K Jha, VS Arunachalam
The Statesman	Flynt Leverett & Hilary Mann Leverett
DNA	No news item appeared during the period of study

Conclusion

After studying the DST coverage of thirteen English-language dailies

published from Delhi and analysing the data so obtained through the content analysis, the following conclusions are drawn.

1. The average DST news story published per newspaper per day is approximately 0.62. This means not a single DST related news appeared daily. Considering that around 2.3% of GDP is being spent on defence, this is abysmal coverage.

2. The Tribune has the most coverage amongst these newspapers with 15.1% of the total. DNA didn't even report a single defence story. The Economic Times has the least coverage amongst these newspapers with 3.2% of the total.

3. The spread of DST news items published is wide. China attracted most attention with 29.9% of the total news published.

4. No correlation between a particular weekday and more DST coverage is found.

5. DST items were mostly reported in news format (49%) followed by articles (31.1%).

6. Mostly (90%) news items were written in general way. There was no mention of any scientific principal process, or technology involved in them. This point towards lack of science background among Indian journalist.

7. Among the news items published, Indian journalists are good at making them interesting. A total of 32.7% of the news items were interesting.

8. The attitude of Indian press towards DST has been neutral (56.2%), positive (31.5%), and negative (12.4%), the press largely seem to be uncritical, unless a major accident occurs.

9. More than half of DST items published bear names of journalists. In 45% of the cases sources were not mentioned. Only one news items is found to be credited to a news agency. This point towards tendency of press to not give credit to news agencies and public relation official of the defence establishment.

10. A very few defence journalists were found. Only 12 to be specific among 13 newspapers under study. Eight foreign journalists also have published in Indian newspapers.

11. Indian press has written about geopolitical strategic equation the most (48.6%) in this period. Defence equipments and products were also reported extensively (36.3%).

12. Level of reporting is on expected lines 65.3% national and 31.1% international.

13. The overall mean of 531.29 words per story of all thirteen newspapers suggests that when DST news were published, genuine depth and good attempts were made extensively. But still science related aspects were not there.

14. Most number of defence journalists published news items in The Tribune (13 Nos).

Discussion

This study points towards abysmal coverage of DST by English-language press. Newspapers have ample space to report about science involved in defence weapons; this opportunity is lost by the journalists. It seems that Indian journalists lack formal science training. Journalists are very enthusiastic, though, a total of 78 journalists have written for DST and its allied areas as defence journalists (having published three or more news stories in entire month). This proves that there is a great dearth of trained defence journalists in India. Defence is a vital sector and deserves more attention from Indian universities. There is a need to train people with higher science and engineering degrees in the field of science journalism. More creativity is desired from the journalists to publish pictorials of defence equipments. On the side of defence organisations, they need to employ people with both science and journalism expertise to present the defence related news in letter and spirit. More cordial relations with the press is the need of the hour.

References

Artz, K. & Wormer, H. (2011). What recipients ask for: An analysis of "user question generated" science coverage. *Journalism*, *12*, 871-888.

Arulchelvan, S. (2010). Science and technology dissemination through Tamil newspapers: A study. *Indian Journal of Science Communication*. *9*(2), 3-9.

Bauer, M., Ragnarsdottir, A., Rudolfsdottir, A.; & Durant, J. (1995). *Science and technology in the British press, 1946-1990: A systematic content analysis of press.*

London: The Science Museum, London and London School of Economics.

Berelson, B. (1952). *Content analysis in communication research*. Glencoe: Free Press.

Bucchi, M. & Mazzolini, R. G. (2003). Big science, little news: Science coverage in the Italian daily press, 1946-1997. *Public Understanding of Science*, *12,* 7-14.

Dubas, O., & Martel., L. (1975). *Media impact: A research study on science communication*. Ottawa, Canada: Ministry of State.

Dunwoody, S. & Peters, H. P. (1992). Mass media coverage of technology and environmental risks: A survey of research in the U.S. and Germany. *Public Understanding of Science, 1*, 199-230.

Dutt, B. & Garg, K.C. (2012). *An overview of science and technology coverage in indian English-language dailies*, *JCOM*, *11*(3).

Elmer, C., Badenschier, F. & Wormer, H. (2008). Science for everybody? How the coverage of research issues in German newspapers has increased dramatically. *Journalism & Mass Communication Quarterly, 85*(4), 878–893.

Guillaume, L. & Bath. P.A. (2008). A content analysis of mass media sources in relation to the MMR vaccine scare. *Health Informatics Journal*, *14*(4), 323-334.

Hartz, J., & Chappell, R. (1997). *Worlds apart: How the distance between science and journalism threatens America's future*. Nashville, TN: First Amendment Center.

Hömberg, W. (1987). Wissenschaftsjournalismus in den Medien: Zur Situation eines Marginalressorts [Science journalism in media: The situation of a marginal resort]. *Media Perspektiven, 5*, 297–310.

Kepplinger, H-M. (1989). *Künstliche Horizonte: Folgen, Darstellung und Akzeptanz von Technik in der Bundesrepublik* [Artificial horizons: Implications, presentation and acceptance of technique in Germany]. Frankfurt: Campus Verlag.

Krippendorff. (1980). *Content analysis*. Beverly Hills, Sage.

Kumar, P. & Kumar, H. (2016). Coverage of Defence Science & Technology in Indian Press: A content analysis of sixteen newspapers. *Indian Journal of Science Communication*, *15*(1), 14-23.

Kumar, S. A. (2013). Science coverage in print media & regional languages: Observations of a content analysis. *Science Communicator*, *4*(1&2), 40-47.

Miller, D. (1999). Mediating science: Promotional strategies, media coverage, public belief, and decision making. In E. Scanlon, E. Whitelegg, and S. Yates [Eds.], *Communicating science: Contexts and channels,* 206-26. London: Routledge.

Nelkin, D. (1987). *Selling science: How the press covers science and technology*. New York, NY: W. H. Freeman.

Nelkin, D. (1995). *Selling science: How the press covers science and technology*. [Revised edition]. New York: Freeman.

Palen, J.A. (1994). A map for science reporters: Science, technology, and society studies concepts in basic reporting and newswriting textbooks, *Michigan Academician*, *26,* 507-19.

Pellechia, M. G. (1997). Trends in newspaper coverage: A content analysis of three US newspapers. *Public Understanding of Science 6*(1), 49-68.

Prasad, B. D. (2008). Content analysis: A method in social science research. In D.K. Lal Das, &V. Bhaskaran [Eds.], *Research Methods for Social Work*. New Delhi: Rawat, 173-193.

Puri, I. (2006). Science & technology coverage in print and electronic media: A case study of Gujrat. *Indian Journal of Science Communication*, *5*(2), 3-6.

Rosen, C., Lars G., & Klara F. (2016). The Question of Newsworthiness: A Cross-Comparison Among Science Journalists' Selection Criteria in Argentina, France, and Germany."*Science Communication, 38*(3), 328-355.

Schäfer, M.S. (2012) Taking stock: A meta-analysis of studies on the media's coverage of science. *Public Understanding of Science, 21*(6), 650–663.

Schafer, M. S. (2009). From public understanding to public engagement: An empirical assessment of changes in science coverage. *Science Communication*. *30*(4), 475-505.

SIPRI Yearbook 2016: *Armaments, Disarmament and International Security. Stockholm International Peace Research Institute*. Sweden: Oxford University Press.

SIPRI Yearbook 2015: *Armaments, Disarmament and International Security. Stockholm International Peace Research Institute*. Sweden: Oxford University Press.

SIPRI Yearbook 2014: *Armaments, Disarmament and International Security. Stockholm International Peace Research Institute*. Sweden: Oxford University Press.

SIPRI Yearbook 2013: *Armaments, Disarmament and International Security. Stockholm International Peace Research Institute*. Sweden: Oxford University Press.

SIPRI Yearbook 2012: *Armaments, Disarmament and International Security.*

Stockholm International Peace Research Institute. Sweden: Oxford University Press.

SIPRI Yearbook 2011: *Armaments, Disarmament and International Security. Stockholm International Peace Research Institute*. Sweden: Oxford University Press.

Summ, A. & Volpers, A. M. (2015). What's science? Where's science? Science journalism in German print media. *Public Understanding of Science*,1-16.

Vilanilam, J .V. (2005). *Mass communication In India: A sociological perspective*. India: Sage Publications.

Weber, R. P. (1990). *Basic content analysis* [Second edition]. CA: Sage Publication.

Weigold, M. F. (2001). Communicating science: A review of the Literature. *Science Communication*, *23*(2), 164-193.

Annexure 1: Specific topic of the news

Sr.	Area	Number of News Items	Percentage (%)
1.	Afghanistan	4	1.6
2.	Agni-6	1	0.4
3.	Agni-V	1	0.4
4.	Air Chief	1	0.4
5.	Aircraft	1	0.4
6.	Arihant	1	0.4
7.	Army	10	4.0
8.	Aryabhatta Award	1	0.4
9.	Augusta Westland	4	1.6
10.	Beijing	3	1.2
11.	Brahmos	1	0.4
12.	Chabbahar Project	1	0.4
13.	China	75	29.9
14.	China-Pak	3	1.2
15.	Cyber-Security	11	3.2
16.	Defence	19	7.6
17.	Defence Budget	3	1.2
18.	Defence Expo	1	0.4
19.	Defence Minister	1	0.4
20.	Defence Sattellite	4	1.6
21.	Defence Food Research Laboratory (DFRL)	1	0.4
22.	DRDO	12	4.8
23.	Electronics	1	0.4
24.	France	1	0.4
25.	GSAT	1	0.4
26.	Helicopter	1	0.4
27.	IAF	11	4.4
28.	Incursion Effect	1	0.4
29.	India	2	0.8
30.	India China Pact	1	0.4
31.	India-China Tie	1	0.4
32.	Indian Warship	1	0.4
33.	Indo-Japan	1	0.4
34.	INS	1	0.4

35.	Iran	4	1.6
36.	Iraq Drone Exporter	1	0.4
37.	Iron Brothers	1	0.4
38.	Israel	1	0.4
39.	Japan	1	0.4
40.	LHC	1	0.4
41.	MIG	2	0.8
42.	Military	6	2.4
43.	Military Equipments	1	0.4
44.	Missile	1	0.4
45.	N-Tech	1	0.4
46.	Naval Exercise	1	0.4
47.	Navigation System	1	0.4
48.	Navy	18	7.2
49.	North Korea	9	3.6
50.	Nuclear Deal	1	0.4
51.	Nuclear Plant	1	0.4
52.	Nuclear Weapon	4	1.6
53.	Pakistan	1	0.4
54.	Radiation	1	0.4
55.	Security	2	0.8
56.	Sukhoi Fighter Plane	4	1.6
57.	Tata Erec	1	0.4
58.	US	3	1.2
59.	US-China	1	0.4
60.	US Air Force	1	0.4
61.	Total	251	100.0

Annexure 2: Author-wise distribution of the news item

Sr.	Name of Journalist	Number of News Items	Percentage (%)
1.	Ajai Shukla	7	2.8
2.	Ajay Banerjee	6	2.4
3.	Alexander Tomas	1	0.4
4.	Ananth Krishnan	2	0.8
5.	Anchal Dhar	1	0.4
6.	Arten Zagarodnov	1	0.4

7.	Arun Kumar Singh	1	0.4
8.	Ashok K Mehta	2	0.8
9.	Ashok Tuteja	5	2.0
10.	B Muralidhar Reddy	1	0.4
11.	Bharat Karnad	2	0.8
12.	Brahma Chellaney	1	0.4
13.	Brig Arun Sehgal	1	0.4
14.	Chiadanand Rajghatta	2	0.8
15.	Claudi Arpi	1	0.4
16.	David E Sangerl Nicole Perlorth	1	0.4
17.	Flynt Leverett & Hilary Mann Leverett	1	0.4
18.	G. Srinivasan	1	0.4
19.	Gautam Datt	2	0.8
20.	Gurmeet Kanwal	2	0.8
21.	Harsh V. Pant	1	0.4
22.	Inder Malhotra	1	0.4
23.	J Shanmugha Sundram	1	0.4
24.	Jayanth Jacob	4	1.6
25.	Josy Joseph	1	0.4
26.	Kalyan Ray	3	1.2
27.	Kanwal Sibal	1	0.4
28.	Kartikeya Sharma	1	0.4
29.	KC Singh	1	0.4
30.	Kuldip Nayar	1	0.4
31.	Kumar Chillappan	1	0.4
32.	Lalit K Jha	1	0.4
33.	Madhumathi D.S.	1	0.4
34.	Man Mohan	1	0.4
35.	Manoj Joshi	1	0.4
36.	Manu Pubby	5	2.0
37.	Moushumi Dasgupta	1	0.4
38.	Narayan Laxman	1	0.4
39.	P Stobdan	1	0.4
40.	Pramit Pal Chaudhuri	2	0.8
41.	Pranab Dhal Samanta	1	0.4
42.	Pravin Sawhney	1	0.4
43.	R Prasad	1	0.4
44.	Rahul Datta	1	0.4

45.	Rahul Singh	6	2.4
46.	Rahul Singh & Jayanth Jacob	1	0.4
47.	Raj Chengappa	1	0.4
48.	Rajat Pandit	7	2.8
49.	Rajat Pandit & Sanjay Dutta	1	0.4
50.	Rajeev Deshpande	1	0.4
51.	Robert M Hathaway	1	0.4
52.	Rohan Venkatramakrishnan	1	0.4
53.	Rubal Singh	1	0.4
54.	S Rajagopalan	2	0.8
55.	Sachin Parashar	2	0.8
56.	Saibal Dasgupta	3	1.2
57.	Sam Roggeveen	1	0.4
58.	Sandeep Dikshit	5	2.0
59.	Sandhya Jain	1	0.4
60.	Shishir Gupta & Pramit Pal Chaudhuri	1	0.4
61.	Shishir Gupta & Rahul Singh	1	0.4
62.	Shiv Arora	1	0.4
63.	Shubhajit Roy	3	1.2
64.	Shyam Saran	1	0.4
65.	Sridhar Kumaraswami	1	0.4
66.	Srikanth Kondapalli	1	0.4
67.	Srinivas Laxman	2	0.8
68.	Sruthijit KK	2	0.8
69.	Sutirtho Patranobis	1	0.4
70.	Umesh Dewan	1	0.4
71.	Vijay Mohan	2	0.8
72.	Vinay Kumar	3	1.2
73.	Vipin Malik	1	0.4
74.	Vishwa Mohan	1	0.4
75.	VS Arunachalam	1	0.4
76.	Y Mallikarjun	1	0.4
77.	Zorawar Daulet Singh	1	0.4
78.	Zulfikar Majid	1	0.4
	Total	137	100.0

Public Screening of Documentaries in Rural India

Scope For 'Nirnay'

Rinku Pegu[1]

1 Assistant Professor, Indian Institute of Mass Communication, Aruna Asaf Ali Marg, New Delhi, India. e-mail: rinkupegu@rediffmail.com

Abstract

India is no stranger to public screening of documentaries. Post-independence, since the late fifties and sixties the documentary mode was adopted pro-actively by the state to promote economic and social programs of the day. However, toward the fag-end of the second decade of twenty first century, when digital India occupies mind space and literal engagement does this practice still hold any relevance? This study attempts to explore the possibility of such a revival through a survey conducted on audience reaction to a screened documentary.

Keywords

Nirnay, Public Screening, Documentary, Behaviour Change, Public Service Broadcasting Trust

The title may sound anachronistic especially in the current context when access to audio visual content is considered given. Circulation of digital technology has not only reduced the cost of producing audio visual content but has made such content affordable for millions of people. In such a scenario why should documentary as a genre be singled out for special attention? Based on empirical evidence the research study attempts to show how it still holds relevance in the areas marked on the wrong side of digital divide. The Annual Survey of Education Report[1] 2017 brought out by Pratham reveals that several eastern states scored a higher percentage than the national average of 63.7 per cent when it came to rural youth having never accessed the internet (The Hindu, 2018). Indeed, Assam where this research has been conducted figure among the eastern states.

This poses a genuine concern? How does one reach out as in the example cited above to the rural youth deprived of internet access in these eastern states and affords them a situation on par with advanced states like Kerala. As a frontrunner in the digital sphere, nearly 70 per cent of rural youth in Kerala uses the internet (The Hindu, 2018). The paper further seeks to articulate why it is desirable to incorporate documentary genre into public communication strategy by facilitating screenings and holding dedicated public exhibitions. Can the genre of documentary through public screening help the administration reach the last mile person and bridge the communication gap with the citizenry? Communication is critical not merely for generating awareness about schemes and programmes but the very success of the latter depends on its effectiveness. Significantly most often than not government interventions in the field of health and education embeds behaviour change on the part of recipient.

Documentary as a film genre

As opposed to cinema that engages with both fiction and non-fiction, the genre of documentary is restricted firmly to reality. The World Union of Documentary in 1948 coined the definition of a documentary as 'all methods of recording on celluloid any aspect of reality interpreted either by sincere and justifiable reconstruction, so as to appeal either to reason or emotion'. Interestingly WUD did not stop at that but went further to accord such recording with specific objectives i.e. 'for the purpose of stimulating the desire for and the widening of human knowledge and understanding, and of truthfully posing problems and their solutions in the spheres of economics, culture, and human relations'. In addition the proposed hypothesis borrows from Michael Renov's[2] exposition that one of the four functions of the documentary is to persuade and promote (Renov, 1993).

What is being proposed is not entirely new? Indeed it had been tried and tested by governments in the past. A study by IIMC (1969-70) of audience reaction to documentaries screened publicly have been carried out in India largely in the 1960s and 1970s when the government of India had aggressively pursued the method of film exhibition to communicate with the public. This was very much evident in the efforts of government media units like Directorate of Field Publicity. In tandem the Films Division (FD) too had churned out several instructive documentaries dealing with diverse issues of nation building ranging from commemorating freedom fighters, to agriculture, to health as well as unity in diversity.

Methodology

Since the research process involved measuring audience reception, attitudes and opinion toward documentary genre, it was considered best to adopt the quantitative research that helps to measure and express in terms of quantity. The data thus collected could then further be collated and analysed either to affirm or deny whether demand for documentary existed and thus establish the need for public screening. To conduct the research the survey questionnaire tool was adopted to administer a set of standard questions to a sample from the audience for eliciting an accurate picture of whole community (Tacchi, Slater & Hearn, 2003). This particular tool is also helpful in ensuring that the sample selected is representative of the population.

The village of Luhijaan located in the Jonai[3] subdivision of Dhemaji district was deliberately chosen as a site to screen the film being at the heart of an area marked by diversity. The four different communities Bodos, Misings, Deuri and tea estate workers inhabiting the surrounding villages comes under the scheduled list. In addition the village had a combined middle cum high school to serve as the venue for screening *Nirnay* (Pushpa Rawat, 2012). Particularly Rukmini Ali Middle School came in handy as it hosted children from four neighboring villages.

In order to establish rapport with the audience, information about the screening was disseminated personally one day prior – by visiting all sections of each standard and explaining to them the documentary genre, the theme of *Nirnay* and the timing of the show on the following day. The time allotted was 4:30 pm as it gave adequate time for the students to go back home after school hours and come back refreshed. They were also encouraged to bring their relatives specially their mother, aunts and grannies.

Study of audience reaction to documentaries screened publicly have been carried out in India largely in the 1960s and 1970s when the government of India had aggressively pursued the method of film exhibition to communicate with the public.

Survey

After the screening was completed with many a hiccup, the respondents after random selection were asked to stay back and give their responses. An average of 15 to 20 minutes was spent on each respondent for interviewing them. To elicit their responses, the questionnaire which comprised a set of seventeen parameters was administered after the following process was completed. Namely first checking out whether the respondent had seen the complete documentary, secondly collecting the personal details of the respondent.

The questionnaire was based on the film content, treatment, message and their engagement with the documentary genre. The idea was to gauge the level of exposure to the documentary genre among the audience and other to elicit people's response to the genre and thereby assess the need and potential for public screening of documentaries.

Accordingly, it was further designed to seek opinion about the possibility of making a documentary on their village, the films main message and the reaction to the screened documentary as well also the necessity of screening documentary on regular basis. Prior to the survey, pretesting of questionnaire was conducted in the local Assamese language with people from different villages.

Most of the questions were open ended and the responses taken down by hand in the primary language of the interviewee i.e. Assamese. A language used by various ethnic communities to as a lingua franca to communicate among them while resorting to their respective mother-tounge in the private sphere.

As part of data collation, the responses were later translated into English to help prepare the research tabulation and the attendant writing. Age group of the respondents varied from early childhood at 10 years to 50 year old women. For the data analysis each of the seventeen questions were tabulated and to further aid the analysis certain cross tabulation resorted to for securing a reading age wise and gender. The results and discussions from the analysis are as follows:

1. Core message of the documentary film;
2. Comprehension of documentary as a film genre;
3. General reaction to the screened documentary;
4. The potential relevance of the documentary genre as an effective means of public communication, especially in the hinterland.

Apart from school going children of both sexes, the audience comprised of school faculty, parents and guardians of the children. This was not surprising for during the explanation of central theme of documentary a day prior, students were appealed to bring along their family members too for the proposed screening. Initially, attendance of school children was particularly high, especially among the middle level. However, frequent power interruptions dissuaded the audience from sitting through the screening. Indeed power disruptions during the screening were twice over. Not only was the power supply erratic, even the generator arranged as a backup gave way.

To gauge the audience reaction, quantitative method was deployed by administering a questionnaire focused on documenting two main areas. One was to gauge the level of exposure to documentary genre and other to assess the audience response to the need and validity for public screening of documentary.

Age group of respondents

The survey was restricted to a sample size of sixteen. Despite the relatively small sample size, the survey still holds out significance for the following reasons. It is well representative as it includes a cross section of audience in terms of age, gender as well as professionals. The latter ranged from home makers, to farmers to craftsperson to educationist. Children from both middle and high school were in attendance.

Interview was taken post screening of the documentary, *Nirnay*. Form among the sixteen respondents the age composition whereas follows. Fifty six percent comprised of teenagers covering the age group thirteen to nineteen. The next age group was the middle-aged who formed thirty one percent of the respondents covering the age from thirty six to fifty. The smallest group among the respondents was the youth covering spanning twenty to thirty five years of age.

About the screened documentary

The documentary that was screened is called *Nirnay*[4] (decision) by first time director Pushpa Rawat and produced by Public Service Broadcasting Trust[5] (PSBT) in 2012. *Nirnay* etches the lives of Mithilesh, Gita, Binita and Lata by following their daily routine of chores and responsibilities of nurturing, care giving, cooking, cleaning etc to their respective families. The narrative unfolds in an engaging way by juxtaposing the expectations and experiences of these four women before and after marriage. Indeed these characters are

shown to be so immersed in their daily routine that taking time out to dwell and ponder on how their lives have turned out had become a challenge.

Based in Uttar Pradesh, the documentary was chosen due to its semi-urban and rural ambience to facilitate audience connect and ensure relatable quotient. Interestingly, two out of four characters were vocal about parental responsibility for nurturing talent and confidence in the girl child. Within the genre, *Nirnay* is based on the participatory mode[6] of documentary film making premised on the relationship between the film maker and the film subject (Nichols, 2001). This mode helps the director to gain direct and in-depth experience from the film by participating in the lives of others. This is in sharp contrast to the poetic mode that aims to create a specific mode and tone rather than providing the viewer with information.

It took the director nearly four years to complete the documentary in 2012 after starting off in 2009. The process was fraught with unpredictability, in the initial stages one had to convince the subjects of the documentary to overcome their unwillingness and coax them to participate. Even during the shoot it was no smooth sailing since the director had to put up with mood swings of the people involved. At times characters in the documentary simply refused.

Through *Nirnay,* director Pushpa Rawat revisits the lives of three women with whom she had grown up prior to their marriage. Rawat follows them with a camera as they go about their daily routine. Though largely filmed in Ghaziabad, *Nirnay* captures a rural ambience through the story of Gita who is shown tending to cattle for supplementing her income as a single parent. The narrative spotlights her struggle to educate her child showcasing the moment where Gita looks back at the family's immediate past on the occasion of her son's wedding.

The three other protagonists have all been raised in semi-rural areas within Ghaziabad while Gita had come from village Keshta as a bride. The common theme underlining the lives of four women is how circumstances conspire to coerce them into embracing a familial life abandoning their personal ambitions. For instance Lata wanted to pursue a career in singing. Among the four women only Pooja could fulfill her dream of pursuing a career as computer teacher.

Nirnay is based on the participatory mode of documentary film making premised on the relationship between the film maker and the film subject (Nichols, 2001).

Research findings

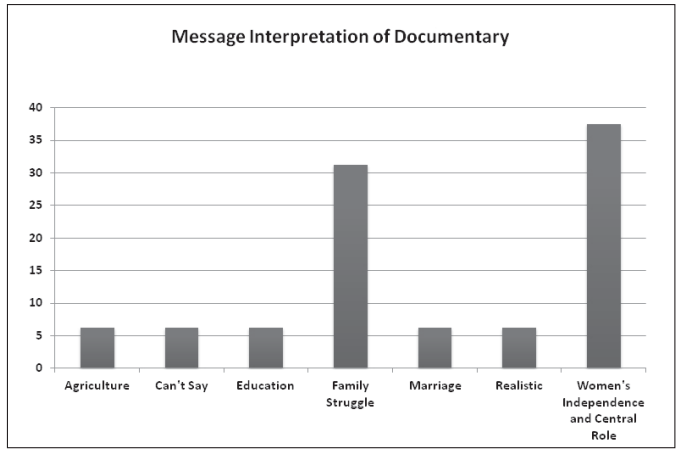
A surprising element thrown up by the study has been the maiden exposure of the audience to documentary genre. Prior to *Nirnay* this genre had escaped

their notice. Indeed the sole respondent who alluded to have watched a documentary, on further probe turned out to have mistaken a feature film titled *Halodhia Choraye Baodhan Khai* directed by Jahnu Barua in 1988. The graphs that follow will further delineate what the overall survey has etched out to back the initial plea that there still exists the case for public screening of documentaries in rural India.

Message interpretation of documentary (Fig. 1)

Over 35 percent of the respondents interpreted documentary to be focusing on the central role of women in taking decision for single parent family and showcasing women independence. The second highest interpretation about the documentary was read as a family struggle to educate the child and secure a job. A little above five percent of the respondents interpreted the documentary to be about education, marriage and agriculture in each of these three categories. Only five percent drew a blank over what the documentary was about.

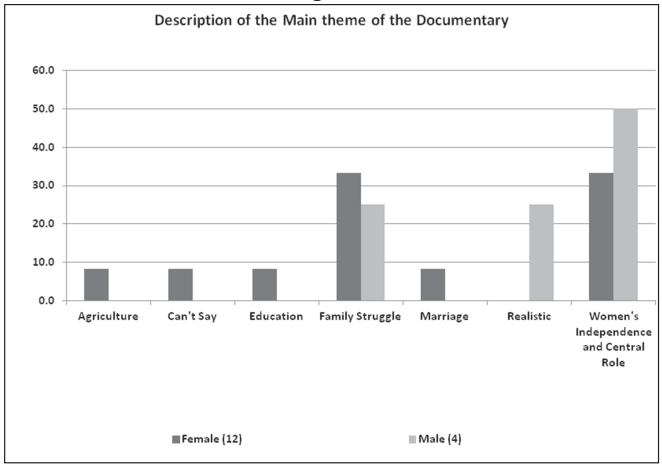
Figure 1



Description of the main theme of the documentary (Fig. 2)

A gendered reading of the survey has been factored in an attempt to trace any difference over the reception of the main theme. The cross tabulation throws up an interesting trajectory. In general describing the main theme of the documentary, respondents have confined themselves to 3 main topics of family struggle, women's independence and central role in the family. Interestingly, female respondents have added on 3 other themes like agriculture, education and marriage. However, all female respondents did not come out with a response with 5 per cent declining to make any particular comment.

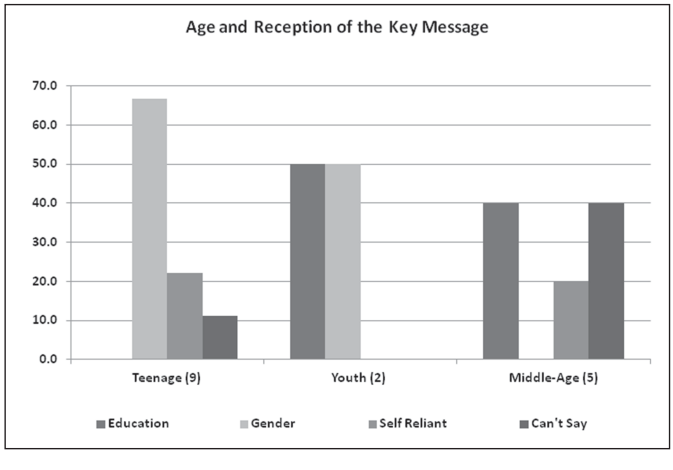
Figure 2



Age and reception of the key message (Fig. 3)

Nearly seventy percent of the teenage respondents stated that documentary was to do with women's roles in the family and the struggle of their daily lives. In other words, central theme of the documentary which was the gendered experience of young women was registered by the respondents. Among the youth fifty percent of the respondents could catch the central theme of the documentary. On the contrary, the other half in this segment considered central theme to be on education. Similarly, in the middle-aged category forty percent of the respondents considered education as a central theme of the documentary. Strikingly, an equal percent of respondents in this segment found it difficult to pin point any central theme for the screened documentary. Interestingly, in terms of message recall of the screened documentary twenty percent of the middle-aged respondents could not recall the key message of the documentary while the youth registered hundred percent .

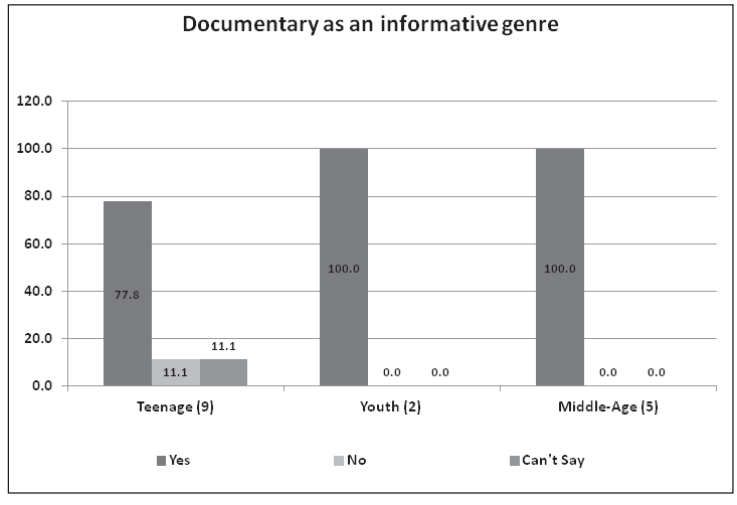
Figure 3



Documentary as an informative genre (Fig. 4)

On the question of whether documentary was informative the respondents came up with three varied responses. Majority, accounting for ninety percent concurred with the view that they could glean more information from the format. Around five percent of the respondents denied the nature of the documentary as a carrier of information. The rest five percent was ambiguous without giving any specific answer on the grounds of not having an opinion. Interestingly the two latter responses came from the teenage segment.

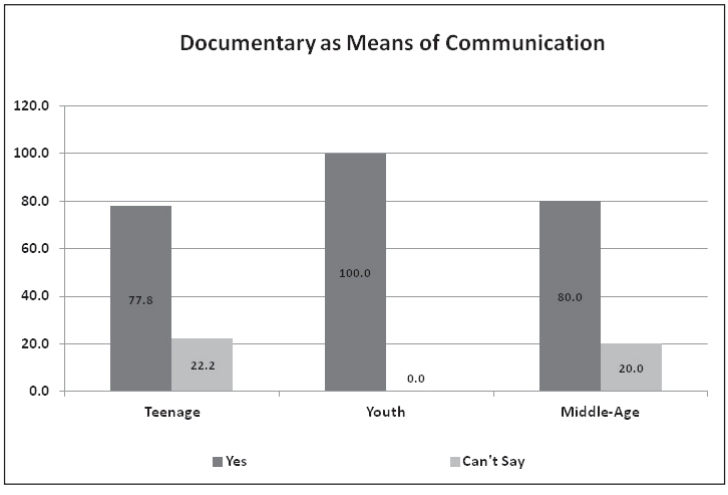
Figure 4



Documentary as means of communication (Fig. 5)

Another popular endorsement by the respondents was the genre of documentary as an effective means of communication. Among the respondents, the youth segment scored the highest with hundred percent endorsement of this idea. In the other two segments of teenagers and middle- aged, eighty percent of the respondents subscribed to the view of documentary as an effective means of communication. In both these groups around twenty percent were unsure about giving any clear cut opinion. Largely documentary was considered to be an effective means of communication due to factual presentation. One of the recurring comments on documentary as genre was that it featured realistic portrayal of life and events and therefore it was easy for the respondents to relate to. Despite language barrier as *Nirnay* was shot in Hindi, the audience could relate to it visually as it dealt with scenes and activity of a semi-urban and rural ambience.

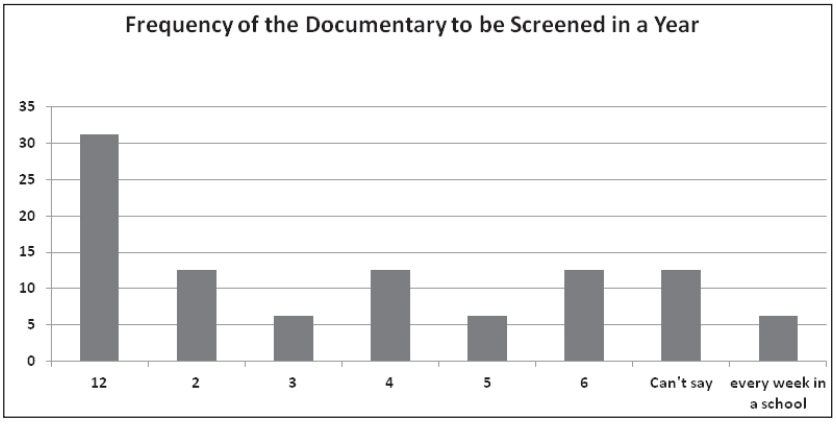
Figure 5



Frequency of the documentary to be screened (Fig. 6)

Ninety per cent of the respondents endorsed the idea of screening documentaries on a regular basis. The remaining ten per cent were not against practice of screening per se but refrained from confirming on the ground of not having an opinion. Interestingly, within the ninety per cent there was gamut of recommendation on the interval of screening. It ranged from once a month, to quarterly to half yearly. Majority of those who agreed, thirty percent of the audience subscribed to the idea of screening documentary once every month. The other popular suggestions each with over ten percent of the respondents were once every quarterly, two months and six months. However to give the complete picture, displaying intense fondness for the medium, few of the respondents went to the extreme of advocating screening of documentaries once a week.

Figure 6

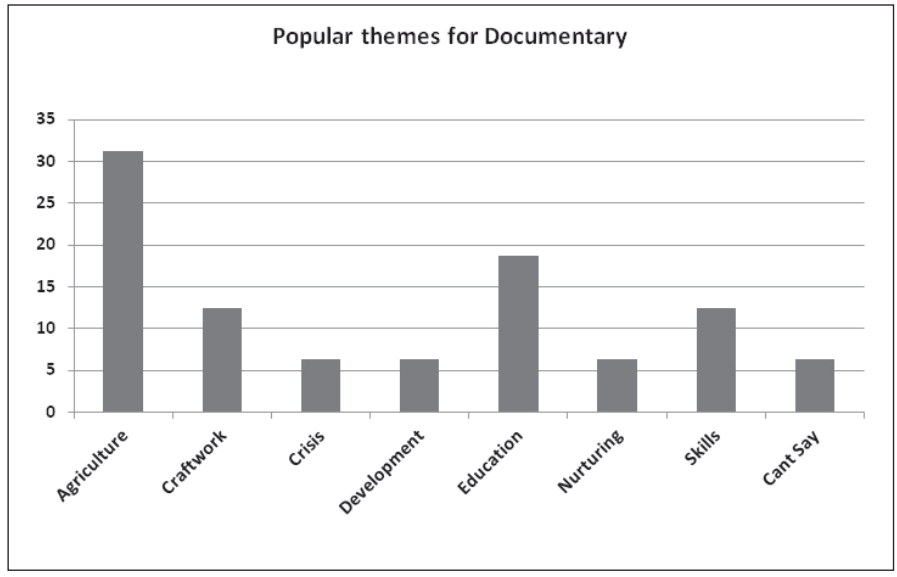


Popular themes for documentary (Fig. 7)

The survey also attempted to gauge the respondent engagement with the genre by asking whether a documentary was possible on their respective village. And if in the affirmative what would be their choice of the subject matter? Over ninety percent of the respondents readily agreed that they would cooperate in the event of a documentary being made on the village or on the issues that affected their lives. The remaining ten percent while not out rightly rejecting participation in a documentary refrained from suggesting any particular topic citing the need for time to think over it.

In the survey that was conducted post- screening, seven broad themes emerged as a likely subject for a documentary. The subject which registered the highest priority among the respondents was agriculture with over thirty percent of the respondents recommending it. Education also figured high on the list of probable subjects for documentary polling about eighteen percent of the votes. The themes of craft work and skills garnered over ten percent each of the respondents consent as likely subjects. The other subjects recommended where crisis management like floods, development issues and also nurturing and parenting with each polling over five percent of the respondents support.

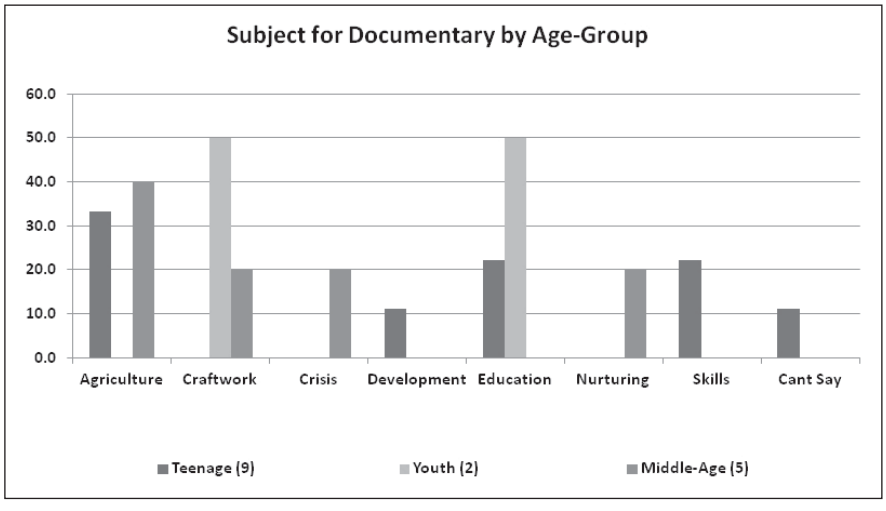
Figure 7



Subject for documentary by age-group (Fig. 8)

The utilitarian aspect of documentary was cottoned on to as evidenced from the various suggestions. The age-wise breakup of suggestions for documentary themes on their respective village throws up an interesting reading. Mirroring their immediate interest agriculture, education and skills featured high on the teen age group list of probable subjects. For the youth most prominent themes for a likely documentary were on education and craftwork polling around fifty percent each. As a reflection of their experience, the middle aged segment was the only group to recommend a documentary on handling of crisis situation like floods etc. Again it was this segment that rooted for a documentary on nurturing. Incidentally, the teenage segment was the only group to recommend that developmental themes should be tackled by documentaries.

Figure 8



Conclusion

This micro study backed by field research does weigh in favour of the presumption that even in the twenty first century; public screening of documentary still holds relevance in rural India. Such a prescription is not farfetched. There is a huge archive of documentary films compiled over the years by public organizations like Films Division and Public Service Broadcasting Trust. Every year these organisations commission a series of documentaries and between them have now built up a reservoir of over

a few thousands of documentaries. Without any dearth of content it is the exhibition aspect of documentary films that needs to be tackled.

Accordingly through a targeted schedule concerned organizations like Directorate of Field Publicity (DFP) with its sprawling network throughout the country should be strengthened. It should be tasked with drawing up an annual calendar for conducting such exhibitions. Prior to this, DFP should be equipped with both infrastructure and human resource. In such a scenario various programs designed and implemented by the government could gain traction not just in terms of numbers but also have villagers meaningfully embrace the process of change through the desired attitude.

Notes

1 In the *Annual Status of Education Report*, 2017 Assam's Kamrup district was surveyed where 64.1 per cent of the rural youth had never used the internet. If such is the case in a district which hosts the state capital Guwahati, the situation could only worsen at Jonai sub-division located 540 kms from Guwahati.

2 In *Theorizing Documentary*, Michael Renov (1993) outlines that of the two root terms on which the concept of the document and its adjectivization as a documentary is based, the Latin word *docere* connotes ability to teach.

3 Jonai subdivision comes under Dhemaji district of Assam and is located nearly 550 kms away from the state capital Dispur. Adjoining Pasighat district of Arunachal Pradesh, Jonai boasts one of the oldest and last outpost in the Northeast Frontier Railway track ie Murkong Selek. It is peopled predominantly by Scheduled Tribe with a sprinkling of Scheduled Castes and has one Vidhan Sabha seat.

4 *Nirnay* has been a recipient of the first most innovative film award instituted by Films Division in 2014. This apart the documentary film has been showcased in various film festivals of India. Director Pushpa Rawat is not a certified graduate from any media institution but was introduced to the craft of film making through a short course on videography at the National Bal Bhavan in 2007. Later on she honed her skills working as an assistant and sound recordist to documentary film maker Anupama Srinivasan. Since her 2012 debut with Nirnay, Rawat has made two other documentary films.

5 Public Service Broadcasting Trust was set up in 2000 with the avowed aim of serving the documentary genre. It creates space for this genre by both commissioning as well as mentoring documentary films. Producing over fifty documentary films a year, PSBT has since bagged 296 awards both national and international.

6 American documentary theorist, Bill Nichols ascribes six modes of representation to the genre of documentary film and video. They are poetic, expository, observational, participatory, reflexive and performative. In the first two modes, film maker is engaged more with constructing a pattern and arguments rather than the act of filming the subject. Whereas in the subsequent two modes of observational and participatory, encounter between the film maker and subject is intense and very often results in collaborative interaction. The reflexive mode goes one step further wherein the film maker is not merely occupied with the subjects but addresses the audience directly by

talking about the act of representation itself. What we find in the performative mode is the film maker dealing with one's own complex emotional experience while filming.

References

IIMC (1969-70). *A report on a study of the impact of documentary films in Tamil, Hindi and Bengali*. New Delhi : Indian Institute of Mass Communication.

Nichols, B. (2001). *Introduction to Documentary*. Bloomington: Indiana University Press.

PSBT (Producer), & Rawat, P. (Director). (2012). *Nirnay* [Motion Picture]. India: Public Service Broadcasting Trust (PSBT).

Renov, M. (1993). *Theorizing Documentary* , London: Routledge .

Tachhi, J., Slater, D. & Hearn, G. (2003). *Ethnographic Action Research.* New Delhi: UNESCO.

The Hindu. (January 19, 2018). *Rural Kerala frontrunner in Internet access, rural Bengal at the bottom of the heap*. Retrieved from http://www.thehindu.com/todays-paper/tp-national/report-highlights-indias-digital-divide/article22468162.ece

Role of Interpersonal Communication in Sanitation Campaigns

Aswathi Mary Varghese[1] &
Swati Jaywant Rao Bute[2]

1 Research Scholar, Amity School of Communication
Amity University, Noida, Uttar Pradesh, India.
E-mail: aswathiv45@gmail.com (*Corresponding Author*)
2 Assistant Professor, Amity School of Communication
Amity University, Noida, Uttar Pradesh, India.

Abstract

India's vast and diverse socio-cultural and economic composition ensures a heterogeneous populous living in both rural and urban settings. Considering the varied living conditions of people and their different realities, it makes it important to conceive this populous as a group with complex needs that can be met by one homogeneous communication strategy or message. Mass media communication channels are typically used in campaigns geared for wide and public audiences, but often campaigns directed to local communities with specifically identified audiences. Involving citizens in problem-solving and planning decisions that affect their everyday lives clearly outlining the importance Interpersonal Communication (IPC) activities. This study is an attempt to understand the role and functions of Interpersonal Communication approaches adopted during the Awareness Building Phase in *Swachh Bharat* (Clean India) Campaign and thereby identify related prospects and problems. To do so, the first section focuses on the theoretical prospective understanding the importance of Interpersonal Communication and strong components of community outreach activities and ground level connect. Further it studies the use of IPC activities based on triggering of community action for provision of sanitation, safe water and hygiene access as part of the above mentioned campaign in two rural villages of India.

Keywords

Communication campaign, Communication channel, Community, Interpersonal Communication, Target audience

Communication campaigns are well designed methods of reaching large audiences with messages designed to produce explicit results. Meanwhile, community level is a good place to start because it is the citizens or members of a community who best understand the problem inherent to the community in which they live and get involved in a coherent dialogue to initiate action towards improving the situation in a collective manner. And here the role of development communication and specifically IPC becomes extremely relevant as any intervention with the intention of achieving a real sustainable development in the living conditions of people will be a big failure unless the intended beneficiaries are actively involved in the process. Here it is important that people participate in all the phases of any campaign [here in discussion *Swachh Bharat* **(**Clean India**)** Campaign], from problem identification to research and implementation of solutions.

Interpersonal Communication, an important constituent of Development Communication, is heavily oriented towards human aspects of development bringing conformity to one's own sense of right conduct. According to Knapp (1984), Interpersonal Communication (IPC) involves a direct face-to-face relationship between the sender and the receiver of the message, who are in an interdependent relationship.

The main scope or function is not mere communication of information or messages but rather involvement of stakeholders as well as assessment of situation is a priority. This calls for an analytical role or so called a dialogical process intended to open public spaces where opinions, perceptions and knowledge are appraised and discussed. Here the reality of development is more complex, meaning calls for broader changes than specific individual behaviour changes.

Role of media

According to Ajzen and Fishbein (1980), interpersonal communication as a tool works predominantly in small and identified audiences/communities with whom the communicator of the message/s has established a direct and personal contact.

There are different channels identified for IPC which include Personal letters, door-to-door communication, face-to-face interaction, speeches and presentation, pamphlets/flyers/brochures to individual addresses, meetings and workshops etc.

Personal letters offer a personal touch, recipients feel that they have been selected to participate and help with the campaign goals. Meanwhile,

face-to-face interactions takes place physically between the message sender and the receiver and is considered to be the best among IPC channels as it serves two purposes both of verbal as well as non-verbal communications.

Moreover, non-verbal including facial expressions, gestures etc. have a greater impact on message delivery than the verbal messages. Campaign strategies involve campaign workers going from door-to-door communicating messages or strategies involve speeches/presentations for live audiences. Another benefit is the idea of instant feedback and the opportunity of having question/answer sessions can often help people to get involved to discuss the campaign issues and draft out solutions to drive the campaign in the right direction. Campaign materials to support campaign goals may include pamphlets, flyers and brochures. Flyers are one page announcements or suggestions while pamphlets usually consist of a two-page fold and brochure consists of two or more pages. The advantage of printed material is that people can have a physical printed document to hold, read and maybe take back home to save as a reminder of campaign goals.

"People usually move through seven intermediate steps in the awareness building and behaviour change process" (Piotrow et.al, 1997). People at different stages constitute distinct audiences. Thus they usually need different approaches, whether through interpersonal channels, community channels or mass media.

An audience group can be generally segmented based on the following stages (Piotrow et.al, 1997):

Preknowledge	Is unaware of the problem or their personal risk
Knowledge	Is aware of the problem and knowledge of the desired behaviours
Approval	Is in favour of the desired behaviours
Intention	Intends to personally take the desired actions
Practice	Practices the desired behaviours
Advocacy	Practices the desired behaviours and advocates to others

"People usually move through seven intermediate steps in the awareness building and behaviour change process" (Piotrow et.al, 1997). People at different stages constitute distinct audiences.

According to the Direct Effects Model of Mass Media Theory by Katz and Lazarsfeld (1955) also known as the Hypodermic Needle Theory or Magic Bullet Theory, mass media has a direct, immediate and powerful effect on their audiences. The mass media in particular is assumed to have a strong influence on the culture and it directly or indirectly influences individuals which is often considered as common knowledge to be passed down to others. On the other hand, this led to another sect of thinkers who felt that people's knowledge is unique and attention, perception and retention of messages varies among individuals.

Further studies found that not everyone was influenced by the mediated propaganda which led to the development of the Indirect Effects Model of Mass Media Theory, also known as the Selective and Limited Influences Theory or Conditional Effects Model. This theory closely looked at individuals who are not directly exposed to media content.

According to Seymour-Ure (1974),

> "a primary [= direct] effect takes place when the person affected has himself been involved directly in the communication process. A secondary [= indirect] effect takes place when individuals or groups not involved in the communication process are affected by changes in individuals who are (p.22)".

It deliberated that mass media is relevant and it does convey information or message to the society but this message is interpreted selectively as per the habits and perceptions of the members of society. This is a result of difference in beliefs, values and attitudes among the audiences which means messages from mass media cannot be seen as uniform or direct rather leads to selective responses.

Coming to idea of a 'campaign' and here in particular sanitation campaigns, one cannot forget the role of interpersonal influencers or policy makers, who are in a position to influence the focal individuals. This stresses on a two-step flow model which means mass media message is channeled to the masses through opinion leadership who are considered to have more access to media, higher understanding of media content and moreover have the ability to explain and intercept the content to the public.

Diffusion of innovations is the product of the two-step flow theory. According to Rogers (2003), "Mass media channels are more effective in creating knowledge of innovations, whereas interpersonal channels are more

effective in forming and changing attitudes towards a new idea, and thus in influencing the decision to adopt or reject a new idea (p.45).

Interpersonal influencers can impact behaviour through activities such as dispensing positive and negative reinforcement, exercising control via rule-making and enforcement, facilitating behaviour with reminders at opportune moments, and serving as role models. The interpersonal communication provided a significant boost to the campaign where the mediated messages were supplemented by intensive face-to-face instruction and informal interpersonal influence. One key advantage of opinion leaders is that they can customize their messages to the unique needs and values of individuals in a more precise manner than mediated messages.

But here again one more factor to be considered is that any new idea presented by a campaign [here in specific *Swachh Bharat* (Clean India) Campaign], are not adopted by all individuals at the same time and it clearly depends on a specific time sequence as more appropriately elaborated by Diffusion of Innovations model known as the '*adopter categories'* (Rogers, 1971) based on how long it takes them to start using this new idea. Meanwhile, adoption of any new idea is caused by human interaction through interpersonal networks. If the initial adopter of an innovation discusses it with two members of a given social system, and these two become adopters who pass the innovation along to two peers, and so on, the resulting distribution follows a binomial expansion. Expect adopter distributions to follow a bell-shaped curve over time.

According to Atkin & Wallack (1990), communication campaigns are primarily designed keeping in mind the primary role of Informing the audiences and second persuasion or in other words influencing the audiences to take timely action.

The more complex instructional messages present "how to do it" information in campaigns to produce knowledge gain or skills acquisition. However, the central type of message in campaigns is persuasive appeal. Most campaigns present messages featuring persuasive reasons why the audience should adopt the advocated action or avoid the proscribed behaviour. In other words, it helps in attitude creation or change, usually via knowledge gain and belief formation. A nation-wide campaign like *Swachh Bharat* (Clean India) campaign which is a lengthy as well as elaborative campaign usually disseminates a wide array of persuasive messages to influence attitudes and behaviours.

Moreover, beyond message qualities and importance of messengers

in the case of campaign, there are two more factors which have gained prominence overtime one being extensive volume of messages designed for the campaign to help attain adequate reach, recognition while creating a strong image of the campaign and the second being the frequency or amount of repetition to facilitate message comprehension and make the public understand the importance of certain behaviours recommended in the campaign.

Many successive communication campaigns like the HIV/AIDS campaign, Anti- Tobacco campaign etc. have shown that message distribution over continual periods by campaign-stimulated factors like interpersonal communication can help the campaign produce stronger impacts in future.

Impact of media

The task of determining which communication approach is appropriate for a campaign depends on the identification of immediate needs of the people at the local level while taking necessary action by the planners and the implementers. The success of any media outrightly depends on its ability of translating information and complex messages into effective approaches to facilitate triggering of dialogue among the audiences.

Here in this case the most functional model seems to be the AIDA Model (Lewis, 1908) which follows four major stages being: Attention, Interest, Desire and finally Action. Coming to this campaign, *Swachh Bharat* (Clean India), the planners and the decision makers need to first of all understand the drivers that motivate people to improve their sanitation situation. Moreover, addressing barriers in the communication campaign is equally important and needs complementary measures. Apart from all of this, most importantly, there is a need for effective and efficient ways to leverage grass root platforms to engage the rural audience to the campaign goals and objectives.

In the past two decades the role of media and communication has become increasingly important and relevant in the field of rural development more popularly known as Development Communication; "The systematic utilisation of appropriate communication channels and techniques to increase people's participation In development and to inform, motivate, and train rural populations, mainly at the grassroots level*"* (Coldevin, 1987, p. 4).

Interpersonal communication in rural India

The success of IPC activities in rural India is dependent on the identified community's curiosity to the new ideas and practices identified for the

Many successive communication campaigns like the HIV/AIDS campaign, Anti-Tobacco campaign etc. have shown that message distribution over continual periods by campaign-stimulated factors like interpersonal communication can help the campaign produce stronger impacts in future.

communication campaign. More importantly, this needs to be supported by necessary resources to enable people to apply available new information to find easy solutions to the problems outlined for the campaign (here in particular: Sanitation).

This is closely associated with the activities and awareness building tasks carried out by the motivators earmarked for the campaign which includes motivators, IEC specialists, educated leaders, community leaders, village head, elders, ASHA (Accredited Social Health Activist) workers, political leaders, students, women etc whose role is to work with the community and encourage them to positive development oriented objectives.

But one cannot dismiss the fact all these conditions work on the basis of certain factors like people must be the principal actors in defining and finding solutions to their problems, the people selected as leaders are easily identified by the local community and here it is important to specify the role of the leaders is to just define the problem to the community and not give the solution. Most importantly, community participation and social action is the goal therefore continuous feedback from the community will be the driver for change in any campaign working at grassroots level.

Research objectives

1. To identify the types of interpersonal communication approaches adopted for the campaign;

2. To study the written, spoken and visual material used in interpersonal communication approaches.

Data collection

The researcher went for field visits in the mentioned villages of the two states, met the officials working in the planning and the execution of the campaign to collect primary data for the study. For secondary data, researcher has consulted books, research articles, newspaper clippings relevant to the subject.

Research methodology

To understand the role of IPC activities based on triggering of community action as part of the *Swachh Bharat* (Clean India) campaign, the researcher selected two rural villages of India; one in Rajasthan and the other in Chhattisgarh. The selection involved two villages in the same district of

Rajasthan in which one is an Open Defecation Free (ODF) village and second where the campaign activities are yet to begin and is a fresh village for the campaign officials. Similarly in Chhattisgarh the researcher selected two villages in the same district one an ODF village and second village where the campaign activities are yet to begin.

The researcher conducted focus group discussions with the village residents to get a fair idea of the awareness and reach of the campaign. The government officials, panchayat members, IEC consultants, localised group members and village residents were also interviewed to know their roles and duties in the campaign as well as how did they support the campaign at different levels.

Rajasthan

In the first state that is Rajasthan, the researcher selected two villages:

1. Nimeda, which is an Open Defecation Free village (ODF) and a part of Jhotvada Panchayat Samiti;

2. Bhambori, again a part of Jhotvada Panchayat Samiti, a fresh village where *Swachh Bharat* (Clean India) campaign activities did not begin.

Goals and objectives of officials

The researcher had a one-to-one discussion with the planners and the implementers to understand the goals and objectives of the officials outlined for the campaign. The main objectives of the officials involved in the campaign was to ensure that the village masses arrive at an informed understanding about the objective of the campaign meanwhile also develop skills to trigger collective local action and gain training skills [knowledge/skills/attitude/motivation]. This will help the field level motivators in developing an action plan to scale up sanitation activities in the project area.

Similarly, the major goal of the trainers and the motivators is to ensure that the people are informed about the importance of sanitation in the process of total development that is it facilitates clean environment, reduction of disease burden and expenditure on health, reduction in waste generation, supports dignity and privacy etc.

They developed a poster in Nimeda village, which is now an ODF village, to show the people during household visits, an important IPC tool, which supports one-on-one interaction. The poster presented a society with

values as the one which is free from the practice of open defecation as this in turn is a marker of good health, end of poverty, self dependency, increase of self respect and lastly feeling of shame.

Sanitation ladder method

Moreover, one common parameter in both Rajasthan and Chhattisgarh is that both these states follow CLTS Approach (Community Led Total Sanitation Approach) in which the major focus is on behaviour change and sanitation is not considered to be an individual asset but is moreover a community asset which is driven by the community.

The community is united to facilitate collective behaviour change favouring collective community decision and total action. This kind of approach helps in emergence of natural leaders within the community to ensure social solidarity and cooperation and use 'trigger tools' for both informing and for igniting behaviour change. It follows a 'sanitation ladder' approach to promote community self monitoring, which means the key to this entire process is the 'facilitator' or the leader to ignite the community with IPC approaches.

Trigger approach

The most popular among all IPC approaches is the 'trigger approach', which means a story or an experience, which makes the people think and act. Triggering can take place both at an individual level as well as at the community level.

The conversation with Birendra Singh, IEC Consultant, working in both the above mentioned villages elaborated on the steps involved in the triggering approach. First of all, the entire community analyses their own sanitation situations till a sense of collective shame, disgust and helplessness creeps in the minds of the people. This forces the community to come together, think and act which will result in finding steps to eliminate open defecation. In the meanwhile, this process also leads to emergence of new leaders who help and initiate collective local action.

The most popular among all IPC approaches is the 'trigger approach', which means a story or an experience, which makes the people think and act. Triggering can take place both at an individual level as well as at the community level.

Tools supporting trigger approach

There are various tools involved in the trigger approach as elaborated by Pratibha Singh, Project Consultant working in the above mentioned villages in Rajasthan, which are the following: walk of shame, defecation mapping, calculation of faeces, calculation of faeces ingested by a person, cost of

illness, respect to occupation, flow diagram for water contamination, holy ignition, open defecation and begging, faeces to mouth transmission, water quality testing, begging of self respect, respect of women, respect to mother – debt of milk, respect to wife – pledge of marriage, respect to sister – *rakshabandhan*, social pride, respect of deity, respect of *pagdi* (turban), difference between human and animal and lastly social boycott. These tools were used very effectively keeping in mind the mindset and situations in and around the village.

Apart from the community triggering tools, there are some earmarked individual triggering approaches as mentioned by Rajendra Shekhar Makkar, IEC Consultant, which include Privacy, peer group pressure, fear, economic reason, demonstration effect and finally reward/incentive. Moreover, these IPC approaches both individual and community are designed in a manner to facilitate and prompt self-mobilisation while making the village people realize for themselves the importance of sanitation to trigger local action by handing over the campaign activities to local leaders.

Individual regressive campaign supporting parent campaign

In support of the main parent campaign i.e. *Swachh Bharat* (Clean India) campaign, there was regressive individual campaign designed for 7 days in all the districts as well as the blocks every month which included rallies, debate, drama, live discussions etc. as mentioned by Moindudeen Khan, Panchayat Pradhan Officer. A *nigrani* (inspection) committee is appointed in very village inclusive of local leaders which played an important role in making the people constantly aware of the bad effects of open-defecation and they used *dhols* (drumbeats)/whistling to gather people's attention.

Live situations and examples

Moreover, a local leader working in Bhambori village, Kamlesh Bairba, mentioned that they substantiated their IPC activities with live discussions with village masses asking them questions like 'How do you eat excreta? If you dip one strand of your hair in excreta and then in water, will you be ready to consume it?

Similarly another example of a fly, asking the village community during a focus-group discussion to imagine a situation where this fly sits on the glass of water kept on the table and it has six legs how dirty is the water (six milligrams)? How costly does it get when you get sick? And think if the same fly travels to four to five kilometers to the nearby villages? Such questions are used to stress on the importance of having a toilet at home.

Both IEC specialists and local leaders working in the above mentioned villages of Rajasthan believe that CLTS approach plays a predominant role which means there are no *Swachhata Doots* (sanitation messengers)instead a District Resource Group is appointed which is inclusive of 50-60 members and here they employ the CLTS approach and stay in the village for two to three days. Field functionaries include school children, women and child development, *anganwadi* workers etc.

There is constant hammering of messages related to the campaign to widen the pressure and under the CLTS approach there is the formation of *ratri chaupal* (night group discussion) to continuously monitor the change and activities of village residents.

Pratibha Singh emphasised the role of Panchayat Samiti which is to inform people about the importance of toilets and also consult the Village Head as part of government machinery and their role is to gather maximum publics to construct toilets and the money is given only after the toilet is constructed.

There are regular meetings organized and thereafter a District Resource Group (DRG) is formed which included a Block Officer, one ASHA worker, one active youth/aged and their role is to go door to door and discuss about local sanitation. If there is no habit change there is morning follow up and evening follow up for five to six days and whistling to stop people from open defecation and there are some gaps given to this method followed by sudden visits to check the overall progress and change in mind-sets of people.

Chhattisgarh

In Chhattisgarh, the researcher selected two villages:

1. Doma, which is an Open Defecation Free village (ODF) in Dhamtari District;

2. Deori village in Dhamtari District, where 'Swachh Bharat/Clean India' campaign activities did not begin.

Interview with the mission director

A brief interview with Dr. M. Geetha, IAS Officer and Mission Director, Chhattisgarh, elaborated on how IPC is a critical part of this campaign and it is way broader than IEC. It involves a lot of experimentation apart from mere use of government machinery. It entails natural leaders. She said:

> In recent years, the impact of the Community led Total Sanitation (CLTS) approach has drawn significant attention. At the heart of this approach is a shift away of the focus of supporting toilet construction for individual households, to an approach that seeks to create 'open defecation free' villages through an emphasis on the behaviour change of the whole community. This is achieved through triggering the communities' recognition of the negative externalities to 'all' as a consequence of the sanitary practices of some. The CLTS approach effectively creates empowered communities who are motivated to take collective action, with the government and other agencies potentially playing a role in facilitating this movement.

An IPC Consultant working in the state for the past seven years said that there are nine 'gems' (meaning people) selected from village to carry everywhere the message based on sanitation.

People holding Padma Sri are coming forward and acting as Brand Ambassadors as it helps in easy identification and they become the face for people for change. Secondly, the success of the movement in the state is also because of the involvement of old people to improve the sanitation situation in the district.

Delayed incentive method

Here another principle which is turning out to be favourable in the state as well as the above mentioned district is the delayed incentive method, which according to the implementers is the ability to resist the temptation for an immediate reward and wait for an enduring reward later. This method has linkages to Sigmund Freud's theory of psychoanalysis where he discussed the 'ego's role in balancing immediate pleasure-driven desires of the instinct (*Id*) with the morality choices of the (*super-ego*) which plays the critical and moralizing role.

Yashwant Sahoo, Block Coordinator working in Dhamtari, said Prime Minister, Shri. Narendra Modi in an event touched the feet of an old lady (104 years) whose 8 sons had died and also was financially poor but she was so moved by the campaign activities that she decided to sell goats to get the money to construct the toilet. A programme 'Call in Open Mind' by BBC presented 13 stories out of which seven were from the state. All these examples stand out as they have no governmental support to achieve this and they are part of the powerful imagery – one to one personal stories.

Once the community is triggered, the local leaders and the implementers start working on the reinforcement and strengthening of the ignition moment. The frequency and intensity of the follow up will depend upon the nature/ scale of triggering conducted in the community.

This ignition moment also begins with the formation and strengthening of the committee (named *nigrani samiti*) which empowers natural leaders to start *nigrani* of defecation sites early morning/evening. Perhaps, if the community is not willing to do the inspection, it should be mobilized again using other trigger tool that was not applied during the first visit.

Project Manager, Chhattisgarh, Rupesh Rathore, elaborated on the trigger tools which need to be applied at regular intervals to instill among the minds of the village people the importance of sanitation and moreover the campaign goals and objectives. They were the following:

Trigger tools- driver of change

- Follow open defecator to the defecation site.
- Faeces covered off by the defecator or committee members
- Whistling while people are watched to go out to defecate.
- Flagging of defecation spot by the open defecator.
- Garlanding/public applause of open defecators.
- Display of names of open defecators at public spots.
- Photography of open defecator and its display at public place.
- Visit to the open defecator house to create peer group pressure.
- Mixed the group of *nigrani* committee: women to stop men and vice versa.
- *Nigrani* conducted by children.
- Mobilise the early initiator to dig the pit.
- Force the open defecator to dig the pit.
- Penalty: cash/kind.
- Cross Subsidisation.

The learning from the field visits by the IPC specialists, leaders and other groups may lead to a discussion on different types of triggering outcomes and related strategies.

1. Where the community is fully ignited and all are prepared to start action

✓ Facilitate action plan and formation of *nigrani samiti*

✓ Facilitate a process of initiation of community monitoring using the

social map drawn by the community

2. Where the majority has agreed but a good number is still not decided
3. Where majority of people are not decided (fence sitters) to initiate collective local action but only a few have decided to go ahead

- ✓ At this stage identify those who have decided to initiate local action and stop open defecation and bring them up front
- ✓ It might happen that all the members of the community were not present during the main ignition and analysis process. If required fix up a date with the community for a second round of ignition PRA (Public Rural Appraisal) within a week.

All these stages incorporate different strategies to move the campaign ahead at a required pace to achieve the ear-marked goals.

Adding on to the development as well as the campaign's reach, Dr. M. Geetha, IAS Officer and Mission Director, Chhattisgarh, said:

> I take the pride in stating that Chhattisgarh is the only state using the CLTS approach. Women involved in the campaign are more stable and once their village turns ODF they go to other nearby villages to facilitate shared learning. Moreover, there are some Muslim women who even said that they will not celebrate 'Eid al-Fitr' without getting ODF status for their village. They feel this campaign helps in building communities and binds them together.

Analysis and discussion

The Community Led Total Sanitation Approach as understood by the researcher in both the states with the interaction with the mission directors, IPC and IEC Specialists, field instructors, village leaders, self group members, *aaganwadi* members and lastly the village masses. It is a rigorous process involving four major phases: planning phase, triggering phase, follow-up phase and finally sustainability phase. Each phase has its own relevant immediate steps and possible outcomes. The planning phase involves rapport building of the leaders with the local population. This is an important process as this helps in identifying influential leaders and getting involved in small groups to have meetings to look at the major issues. These steps will eventually lead to local triggers (at a small level). In the second phase, i.e. the triggering phase, the triggering happens for the community, schools, *aaganwadis* and the religious and the community places. The possible outcomes in this phase include the emergence of natural leaders, *nigrani*

and sanitation committees are formed. The third phase, the follow-up phase which usually takes place post three months of the second phase includes morning-evening follow up, strengthening of the *nigrani* committee, hygiene sessions in schools and *anganwadis* and weekly community monitoring. The possible outcome for this phase includes the village is either declared open defecation free or is on the verge of attaining this status and secondly the incentive money is also released. The last phase is the sustainability phase which involves the continuation of the morning and the evening follow-ups and the hygiene sessions. It also includes the cross visits of natural leaders from other communities. The possible outcomes from this phase include 'walk of pride' after a village is declared ODF and they receive their last installment of incentive money. The other nearby communities also learns and tries some of the steps in their own village to achieve the status.

Conclusion

A sound and effective communication campaign should be based on an overarching vision of what needs to be achieved to address a particular issue/ concern [here in particular is sanitation for the *Swacch Bharat* (Clean India) campaign]. Addressing this concern using Interpersonal Communication, the strategies need to be integrated with other communication channels and needs a long-term focus, should be responsive to individual behaviour change needs, and should maximize the potential for change on a broader societal level. IPC is not merely concerned with providing information about the campaign goals and objectives. Several researchers in India have emphasized the importance of individual skills, ways of approaching the masses and using IEC tools very efficaciously. This will help the communities in question to decide for themselves what objectives they want to aim for and what means they want to use. Meanwhile, this will also help the implementers help in knowing the needs of the target group and their channels of communication, stimulating the processes of community participation and decision-making. IPC is not merely concerned with providing information but also gives people ample opportunity to understand new ideas and on how they work and with what effect giving a fair understanding on how these ideas operate in real life situations. The ultimate goal of IPC is to catalyse local/grassroots communication to smoothen the process of development.

References

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behaviour.* Englewood Cliffs, NJ: Prentice Hall.

Atkin, C. K., & Wallack, L. (1990). Mass Communication and public health: Complexities and conflicts, Newbury Park, CA: Sage.

Bairba, K. (2016). *Personal interview*. May, 2016

Coldevin, Gary (1987). Perspectives on Communication for Rural Development. Rome: FAO

Geetha, M. (2016). *Personal interview*. June, 2016.

Katz, E. & Lazarsfeld, P.F. (1955). *Personal Influence*. New York: Free Press.

Khan, M. (2016). *Personal interview*. May, 2016

Knapp, M. L. (1984). *Interpersonal communication and human relationships*. Boston: Allyn & Bacon.

Makkar, R.S. (2016). *Personal interview*. May, 2016

Piotrow, P.T., Kincaid, D.L, Rimon J.G.I., & Rinehart, W. (1997), *Health Communication: Lessons from Family Planning and Reproductive Health*. Westport, CT: Praeger Publishers.

Rathore, R. (2016). Personal Interview. June, 2016Lewis, E.S.E (1908). *Financial advertising (The history of advertising)*. USA: Levey Brothers.

Rogers, E. M. (2003). *Diffusion of innovations* (5th Ed.). New York. NY: Free Press.

Sahoo, Y. (2016). *Personal interview*. June, 2016

Seymour-Ure, C. (1974). *The political impact of mass media*. Beverly Hills, California: Sage.

Singh, B. (2016). *Personal interview*. May, 2016

Singh, P. (2016). *Personal interview*. May, 2016

ABSTRACTS
COMMUNICATOR VOLUME LII(3), JULY-SEPTEMBER 2017

Culture and the Role of Media: An Analysis of the Cultural Influences of Media Technologies on Communities

Azmat Rasul

Cultural boundaries of communities are not etched in stone but have slippery divisions dependent on the self-adopted labels of groups. It is often said that television and internet has changed the world. In the same way, people often speak of a new world, a new community and a new phase of history being created by the latest media technologies. Old values are being supplanted by new ones and a new hybridised culture is strengthening its position in the communities. Internet has emerged as a convergence technology and new virtual communities transcending territorial boundaries are interacting with each other and posing new challenges to the nation-states, which according to liberal scholars, is in retreat. This study examines the influence of media and communication technologies on communities and the role mass media plays in bringing communities together. In the backdrop of glocalisation and cultural hybridisation, this theoretical paper advances our understanding of the cultural implications of communication technologies.

***

BRICS: International Communications and a New Emerging Order

Sunetra Sen Narayan

The New World Information and Communication Order (NWICO) arose at a time when the Cold War and bi-polarity defined International Relations. The collapse of the Soviet Union has lead to fresh theorising about relations and communications in a Post Cold War scenario. While the original impetus for the NWICO lay in economics, it was quickly extended to communication structures and systems. The Cold War period was also characterised by an emphasis on hard power. The post cold war period has seen the growing importance of 'soft power' and information. The past two decades have also been characterised by globalisation, with communications being both a cause and consequence of globalisation. Against this back-drop, what is the role of information vis-a vis the emerging BRICS order? While pondering this central question, countries such as India, China and Brazil are not only large consumers of media content, but they are also large producers of it, including entertainment programming. However, at present there are insignificant communications flows between BRICS countries. This study explores these issues.

***

Military-Media Engagement in Conflicts and Disasters

Air Vice Marshal Rajesh Isser

The role that both mass media and social media play in the functioning of the armed forces in conflict and disasters has effectively changed the rules of doing business between them. With the explosion of both forms of media, all sides would try and exploit this in a crisis situation. In the absence of active engagement with media, the tendency to sensationalise events would be predominant. There is need for leveraging media and train specialists to handle an ever-evolving social media; as also a need to identify professionals and empower them by creating designated media cells at all levels of armed forces. New Media devices pose a conundrum of problematic issues as well as windows of opportunities within the armed forces.

***

Public Relations Practices in Indian Universities

Raghvendra Mishra

Public Relations (PR), apart from managing organisational communication affairs, contributes significantly in Human Resource (HR), Marketing and Corporate Social Responsibilities. Both its functional and advisory role give important inputs in organisational operation and thus no management can ignore the existence of PR units in the organisation. Higher Education in India is going through major changes and apart from increasing enrolments, other issues such as quality of the HR, skill development and attracting students have become criteria to evaluate. In the recently launched National Institutional Ranking Framework (NIRF) peer perception is adopted as a very crucial point that affects the overall ranking of the institution. In such environment Public Relations can play a vital role in attracting talents, improving image and overall ranking of the institution. This study is an attempt to discuss the status of the Public Relations in Public Sector Higher Educational institutions. The study highlights differences in the structure and functions of the PR in Central Government-funded Universities and State Government-funded Universities and its consequences.

Guidelines for Authors

Communicator focuses on a wide range of issues related to media and communication and welcomes articles that are primarily based on communications discourse and current media debates. Communicator receives articles, case studies, review articles and research papers with following specifications:

- The text format should be double-spaced, 12-point font size in Times New Roman.
- Manuscript should be submitted in word document (.doc/docx) format only; we do not accept PDF files.
- The manuscript should not be more than 7000-8000 words.
- All tables, figures, appendices and endnotes should be placed after references.
- All submissions must include a short biographical note for each author.

For research papers

- An abstract of not more than 150-200 words should be included in a separate electronic file, and indicate details about the author, contact information, institutional affiliation etc.
- Submissions must conform to the stylistic guidelines of the Publication Manual of the American Psychological Association (6th edition).
- Research papers submitted to the journal are subject to peer review based on initial screening by Editorial Team and blind review process.

Submissions must be unpublished original manuscripts, not under review elsewhere, and should include declaration of original work. Copyright of the article and other materials published in the journal shall lie with the publisher.

Submissions should be addressed to:

The Editor, Communicator,

Email: editorcommunicator@gmail.com / communicatoriimc@gmail.com

SUBSCRIPTION/RENEWAL FORM

To
The Editor
Indian Institute of Mass Communication
Aruna Asaf Ali Marg,
New Delhi-110 067

Dear Sir/Madam,

I would like to subscribe to your quarterly journals:

Communicator(English) Rs. 120/- (per issue)

Sanchar Madhyam(Hindi) Rs. 120/- (per issue)

for the Calendar (Jan-Dec) ..... I am enclosing a demand draft No. .....dated.....drawn on .....for Rs.....

The journal(s) may be sent to the following address :

Name .....

Address .....

.....

.....

Signature with date

Demand draft should be made in favour of
INDIAN INSTITTUE OF MASS COMMUNICATION, payable at Delhi.