Consumption Pattern of Science Popularization Media in Kerala: A Study of Kerala Sasthra Sahitya Parishath Publications

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Abstract

Popularisation of science and technology plays a vital role in all-round development of societies. In particular, science popularisation stimulates intellectual accomplishments, catalyses technological advancement, promotes creativity, produces proficient human resources, prevents environmental degradation and strengthens educational systems. Recognizing such potential of science popularisation, vigorous efforts have been made in both developing and developed nations over the last fifty years to increase the level of public understanding of science. But, the results have been less than satisfactory, especially after the active presence of globalization and digital technology in communication sector. Why and how the science popularisation programmes fail to achieve the desired outcome? The study seeks answers to these vitals questions from the publishing experience of the most popular public science movement in Kerala: Kerala Sasthra Sahitya Parishad during the last decade.

Keywords

KSSP, Science Communication, Science Popularisation

Introduction

Since ancient times, scientific explorations and research activities have been encouraged by kings and rulers. And, notable results have been achieved in fields like astronomy, physics, medicine, mathematics and so on. However, a wide gap between scientific knowledge and common man has persisted. No considerable effort appears to have been taken by the rulers to bridge the gap (Vilanilam, 1993). Analysing the state of affairs in India, John A. Lent (1998) observes: "(in India), science and technology ended up in hands of high level officials, scientists and technocrats who raked in the benefits of themselves and a small elite group, while displaying very little social awareness about millions of absolutely poor people in the country".

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The most recent history of science communication in India dates back to the end of the 19th century, when the first science books imported from Britain were translated into the Indian languages and distributed among the upper echelons of society (Mazzonetto, 2005). Following Independence, first popular movements for science communication began to emerge. In 1950s, the new Indian government decreed the need to build the new nation based on a widespread scientific approach to development. The first Prime Minister Jawaharlal Nehru, introduced the concept of modern 'scientific temper', a phrase taken to mean an enquiring attitude and analytical approach that lead to rational thinking and the pursuit of truth without prejudice. Accordingly, the Constitution of India included a special provision to develop scientific temper, humanism and spirit of enquiry.

Taking cue from the Constitution and inspired by the Nehruvian concept of scientific temper, India begun to implement several development communication projects, mostly clubbed under the Five Year Plans of the Government of India. The aim was to sensitize the masses to scientific practices in health, agriculture, home management, family planning, environmental protection etc. This resulted in the beginning of a systematic institutional science communication pattern at the Government front. Simultaneously Government started to promote popularisation activities of individual writers and activists besides ensuring a wider coverage of scientific information in mass media. An intensive era of publishing and translation of school and popular science books began. Flowing from such efforts, science writers and activists began to form peoples' science movements in various parts of the country.

Jawaharlal Nehru, the first Prime Minister of India is the first statesman who recognized the significance of scientific temper in nation building. Nehru well ingrained the concept of scientific temper into his vision of making a new India. According to him, scientific temper is not just acquiring science knowledge but to inculcate a positive attitude towards science and its capability to transform human life in a progressive direction. He has believed that scientific temper reflects one's logical, rational and analytical thinking, systematic and orderly way of his performance in all spheres of life, his reasonable behaviour and conduct in the society and of course a rational decision making power. The scientific temper and method of science portray one's overall personality, which is clearly visible through actions. He hoped that replication of these actions from personal level to societal level would make India an ideal State. Mazzonetto (2005) observes that at present, apart from the mass media, there are two types of science popularisation modes in India. On the one hand, there is institutional communication, managed at a governmental level by National Council for Science and Technology Commission (NCSTC) whereby information is conveyed through mass communication and national education system. On the other hand, there is communication among the population itself, mostly by peoples' science movements, which aim at the dissemination of basic science knowledge among the lower strata of the society.

At institutional level, NCSTC has offices and delegations in all Indian states and territories to carry out popularisation activities in regional languages. It has set up a network of more than one hundred organizations at governmental and non-governmental levels. Another official institution is *Vigyan Prasar. S*et up in 1989 by Government of India. *Vigyan Prasar* extensively publishes printed materials for distribution among the public. It also coordinates science popularisation activities of scientific institutes, schools, universities, museums and academies. The National Center for Science Communicators (NCSC), National Institute of Science, Technology and Development Studies (NISTADS) National Council of Science Museums (NCSM), are some of the other institutions dedicated to science popularisation in India.

Mass media including newspapers, magazines, radio and television channels, Internet sites and publishing houses are also actively contributing to the communication of science by producing content with a popular flavour. Many newspapers publish weekly science and technology pages. *Vigyan Prasar* provides weekly ready-to-print science content to around 21 newspapers in Hindi and English. All India Radio (AIR) which reaches 99 per cent of India's population, broadcast in 24 languages and 246 different dialects also plays a vital role in science popularisation. AIR's *Manava Ka Vikas*, 144 part series on human evolution was a major landmark in the history of science popularisation efforts. Doordarsan, India's official television is also actively engaged in science popularisation through a variety programmes aimed at different segments of society. Interactive modes such as science exhibitions, fairs, seminars, workshops, tours, and film screening are conducted by governmental and non-governmental agencies, have contributed to science popularisation.

In 1980s, the movements set up over the years in different parts of the country were networked into an umbrella organization called 'People's Science Movement' which later changed its name to the All India People's Science Network (AIPSN). Among these networked science movements, Kerala Sasthra Sahitya Parishath (KSSP) is the largest and eldest surviving group.

Kerala Sasthra Sahitya Parishath

The roots of Kerala Sasthra Sahitya Parishath (KSSP) rest in the three science popularisation episodes that unfolded in Kerala during the late 1950s and the mid 1960s. Chronologically, the first among them was the *Sastra Sahitya Samity* (Science Literary Forum) formed in 1957 by a handful of popular science writers in Malayalam at the Bhadra Kala Conference held at Ottappalam, Palakkad district of Kerala (KSSP, 2003). The aim of the *Samity* was to set up a platform to encourage science writing and popularisation in Malayalam.

Though short-lived, the *Samity* published a book titled *Adhunika Manusyan* (Modern Man) in Malayalam modeled on the Penguin Science News Series. This 102-page publication, priced one rupee, contained several articles on various subjects ranging from mathematics to food science. Following its success, the *Samiti* published yet another book titled *Adhunika Sastram*, (Modern Science). It could not materialize the next project of translating and publishing Darwin's 'Origin of Species' in Malayalam due to financial crunch. Eventually with the members becoming more involved in other projects, the organization ceased to function.

The most vital episode that paved the way for the birth of the present-day KSSP was the initiative by a gathering of science writers at Kozhikode in 1962. Dr. K.G. Adiyodi was the mastermind behind the initiatives. Adiyodi, who had completed higher studies in Zoology in Madras Christian College, Chennai and returned to Kerala in 1958 as a college lecturer, found that science reading material in Malayalam was confined to a few books and occasional articles in weekly supplements of Kerala's mainstream newspapers. From 1958 to 1962, Adiyodi advocated the need to harness the potential of science for Kerala's development. He invited science writers and science enthusiasts to a meeting held at Calicut on April 8, 1962. It was here that Kerala Sasthra Sahitya Parishath came into being with Dr. K. Bhaskaran Nair as president and KG Adiyodi as secretary and N.V. Krishna Warrier, the treasurer (Adiyodi, 1982).

The main objective of KSSP was to cultivate an interest in and awareness of modern science among the masses. To that end, it sought to publish science books and periodicals in Malayalam; organize meetings, discussion, science film shows; and assist other

organizations working towards similar goals. It was Konniyoor R. Narendranath who suggested the name *Kerala Sasthra Sahitya Parishath (*It is spelt as *Kerala Sastra Sahitya Parishad also)* which can be translated to English as 'Science Literary Movement of Kerala'. Though formed on April 8, the formal inauguration of KSSP took place on September 10, 1962 in Kozhikode by Fr. Rev. Theodosius, Principal of St. Joseph's College, Devagiri, Calicut.

Following the inauguration, KSSP conducted a five-day exhibition of science books and seminars as well on various science topics. Further, KSSP compiled a *'Who is Who'* of popular science writers in Malayalam and distributed it to the prominent Malayalam print media to promote their coverage of science content.

The third episode was KSSP-centric. In the latter half of 1960s, a team of Bombay-based Malayalee scientists and science activists joined KSSP. Some of them had completed their higher studies in Moscow and had a different perspective of science popularisation. In later years, the new members radically shaped KSSP activities in vogue today (Isaac & Ekbal, 1988; Zachariah & Sooryamoorthy, 1994).

Objectives of KSSP

The objectives of KSSP are to (i) popularise science and scientific outlook among the people, (ii) develop a sense of optimism in them instilling a sense of self-confidence that they can change the world and can build a better tomorrow, (iii) expose and oppose the abuse of scientific knowledge detrimental to the interests of the majority , (iv) expose and oppose abuse of environment and (v) propose and help implement alternative models for development through research and development to transfer technologies from laboratories.

KSSP's Philosopy of Science

KSSP's philosophy of science is based on the conceptual framework that Indian society is a dialectical composition of the haves and the have-nots, of which the former is a minority but continuously getting richer and the later, a majority continuously getting impoverished due to the unequal distribution of resources and unscientific social policies. The KSSP claims that it takes on every issue, a stand partisan to this majority and it believes that the only solution to the problem is to arm them with the weapon of science and technology to fight against impoverishment. In 1973, that aim coalesced into a popular slogan 'Science for Social Revolution' (Zachariah, 1989).

Though the term 'science' is generally defined as systematically organized knowledge, tested logically or empirically, the KSSP views it in an alternative way giving importance to its functional dimension instead of equating it with certain branches of knowledge. KSSP believes that science must be perceived as a process or means by which human beings attempt to explore relationship between cause and effect, whether in the natural or social world (Zachariah & Suryamoorthy, 1994). It also perceives that science is a social process that demands "large scale communication", leading to 'information transfer', 'attitudinal change' and 'action initiation' aiming at an overall improvement in human life. Hence, popularisation of science, according to KSSP, is to enhance the people's power to understand and analyse social issues in a scientific way so as to help them play a more active role in the society (www.kssp.org).

Organizational Structure

As an organization, the KSSP has a four-tier structure comprising (i) units functioning at village level, (ii) sub-regional committees catering to about 10-15 units, (iii)

I4 district committees and (iv) State committee. The office bearers at State level comprise of president, two vice-presidents, general secretary, treasurer and three secretaries. Election is held every year and nobody is allowed to hold the same office for more than two terms. According to the 45th Annual Report, it has formed sub committees to coordinate issues related with development, education, publications, environment, art and culture, gender issues and health issues (KSSP, 2007).

KSSP Members

As per the 45th Annual Report, KSSP has 32869 members in 2007, all of them working on voluntary basis. The most predominant group is that of educated employed and unemployed youth and the next important group is that of teachers. KSSP embraces all sections such as engineers, doctors, lawyers, agricultural workers, administrators, technicians, nurses, teachers, peasants, students, scientists, political activists, social activists, etc. Out of the total 32896 members, 6958 (21.15 per cent) are women. However, there has been a decline in its memberships since 2002. See Table 1.1.

Table 1.1: Fall in KSSP membership

Year	Total members	Drop-outs (in percentage)
2002	45913	31.32
2003	41325	32.73
2004	35342	34.83
2005	36434	25.34
2006	34400	28.29
2007	32896	26.38

Sources: KSSP Annual Reports from 2002 to 2007

Communication Channels of KSSP

As a science movement, KSSP has developed an alternative communication system comprising print and traditional media for popularisation of science in Kerala. And, recently it has entered the world of new media by developing its own website and releasing some audio visual materials (KSSP, 2008). In terms of the organizational objectives of KSSP, its communication activities can be classified as communication for information transfer, for attitudinal change and for action initiation. While magazines, circulars, posters, notices, pamphlets, documents and interpersonal contacts are used for information transfer and attitudinal change, traditional media and agit-pop methods are employed for action initiation. KSSP's communication channels can be classified as:

Interpersonal and group communication methods

Study classes, lectures, public meetings, discussions, open defenses, demonstrations, exhibitions etc where people get a chance to interact with the sources of communication to seek clarification and immediate feedback.

Print media

Print media include popular science books, pamphlets, internal communication materials and periodicals.

Traditional media

KSSP widely uses traditional/ethnic art forms like *Ottanthullal, Kolkkali, Komaramthullal, Kurathiyattam, Villadichanpattu, Chakyarkoothu, Mappilappattu,* etc. to get across its messages and perpetuate its ideologies. The traditional media are, however, not used in traditional way. Several of them are adapted in innovative ways. Often, they are converged to form new content as is done in Science Art Processions (*Sasthra Kala Jathas*) and street performances.

Electronic media

This category mainly includes documentaries, video CDs and websites. KSSP entered the electronic media world with a documentary named '*Nilavili*' (Scream), which depicts environmental issues. But, the use of the Internet for science communication has not been taken by KSSP in an active way though there are individual initiatives by its members and units.

Print media of KSSP

KSSP's niche in science communication is in print media. It has already developed a sustainable market for popular science books in Malayalam and has published more than 900 titles. KSSP claims that it is the single largest science publisher in Kerala with about 30 to 40 new titles and reprints per year (KSSP, 2006).

Popular science books

In Kerala, popularisation of science was started by introducing fundamentals of science and technology in modern curriculum. For long, science was confined as a traditional knowledge area accessible only to those who controlled the power and dominated the social hierarchy. And the social elites communicated science in limited circuits only, that too for protecting their vested interests. As a result, social evils like casteism, untouchability, and denial of literacy prevailed aggravating the condition of the deprived and the down-trodden. Recognizing to the need to correct such a social scenario, social activists and reformers started to conceive methodologies for popularisation of science through formal and informal education. Consequently, volumes of articles and books on science related topics began to surface in Malayalam (Balakrishnan, 2007).

Early Malayalam science publications which primarily focused on ayurveda, astronomy and mathematics were mostly translations of traditional Sanskrit texts. The first science article in Malayalam appeared in *Paschimodayam* launched in 1847 by Dr. Herman Güntert. The book titled *Yogamritom*, which is believed to be written by a Namboothiri of Perinjallur village, now in Kannur district, is considered the first printed science book in Malayalam. A revised edition of *Yogamritom* was published by Oopota Cannan in 1861 at Calicut. It was with the initiatives of *Sasthra Sahitya Samity* and KSSP that science publishing in Malayalam entered the professional era.

Annually KSSP publishes 21 new titles and 20 reprints on an average, according to the statistics in the Annual Reports from 2004 to 2007. The year-wise details of the publication are given in Table 1.2

Table 1.2: Book publishing – New titles and reprints

Year	New titles & Number of copies	Reprint & Number of copies
2004	26 (95000)	12 (44000)
2005	26 (85000)	20 (65000)
2006	23 (84000)	34 (122000)
2007	11 (36000)	13 (32000)

Number of copies in parenthesis
Sources: KSSP Annual Reports from 2004 to -2007

Every year KSSP collects annual average revenue of Rs 40.84 lakh from the sale of popular science books during sales campaign which are usually held during November and December along with annual *Sasthra Kala Jathas.* The revenue details are given in Table 1.3.

Table 1.3: Annual income from book sale* from 2001 to 2007

Year	Annual collection *(Rs in Lakhs)*
2001	28.1
2002	49.3
2003	35.6
2004	40.2
2005	40.5
2006	52.4
2007	39.8

Source: KSSP Annual Reports from 2001 to 2007
**Data of book sale during Sasthra Kala Jatha campaign period only*

KSSP publishes popular books on a variety topics ranging from basic science to nanotechnology and gender issues to developmental matters.

Pamphlets

Pamphlets are considered effective means of communication by KSSP. It brings out pamphlets on current issues of topical interest and circulates them among the public through interpersonal contacts. This mode of direct selling offers a two-way communication system between KSSP activists and the public. Every year KSSP publishes average 7 pamphlets on a variety of issues and topics. The average number of copies of pamphlets published annually is 78387. See Table 1.4 for details.

Table 1.4: Publication of pamphlets from 2004 to 2007

Year	Numbers	Total copies
2004	6	44000
2005	9	146050
2006	6	63500
2007	7	60000

Source: KSSP Annual Reports, from 2004 to 2007

Sasthragathi magazine

The first magazine that the KSSP published with an objective of creating increased awareness of the public understanding of science in Malayalam was *Sastragathi*, which means 'The Science Path'. The target audience was the adults. Launching *Sastragathi* was not easy (Panicker 1982). At its beginning, the primary concern of the KSSP was to

disseminate science information in Malayalam. For this, the easy way was to publish a science magazine. But, KSSP had no fund for it. So, in 1966, it approached publishers of the two major newspapers in Kerala – the *Mathrubhumi* and the *Malayala Manorama* – to finance a science monthly in Malayalam, with the assurance that KSSP would take whole responsibility for the editorial content without claiming any remuneration. But, both publishers turned down the proposal saying that there was no marketing scope for a science magazine in Malayalam. Following such a discouraging response, KSSP decided to launch the magazine on its own and a three-member editorial team comprising N.V. Krishna Warrier, P.T. Bhaskara Panicker and M.C. Nambudiripad, was constituted. The first issue contained 12 articles on various subjects like water, electronic computer, flowers, and a special article on the KSSP and the importance of science popularisation in Malayalam. The founder editor of the *Mathrubhumi* Daily, K.P.Kesava Menon, released this 120-page quarterly magazine, priced at Rs. 1.50, at Calicut on November 28, 1966 (Panicker, 1982).

In 1968, when KSSP was under the presidency of P.T. Bhaskara Panicker, *Sastragathi* captured a secured circulation and its quarterly schedule became more stable. When the increase in circulation was visible, it was made a bimonthly in 1970. Now it is a monthly publication.

The thrust area of the magazine in its early years was science and its influence on society. It remained so till mid 1990s when it began to publish more articles on social issues than on science-oriented subjects. The 38th Annual Report of the KSSP remarks: "the content of *Sastragathi* has become more centered on the current socio-political issues, though there are a few articles related to science and society. The main reason for this shift is the unavailability of pure science articles. The editorial team constantly failed to get such articles" (KSSP, 1992). To overcome this problem, *Sastragathi* conducted a science-writing workshop for college students to ferret out new talents. However, the result was not so positive. Another important problem that the magazine faces is that its circulation has not registered any spectacular growth over the years. See Table 1.5.

Table 1.5: Circulation of *Sasthragathi* from 2000 to 2007

Year	**Number of copies** (Monthly average)	**Year**	**Number of copies** (Monthly average)
2000	6425	2004	5250
2001	5470	2005	6000
2002	6137	2006	6800
2003	6150	2007	7600

Sources: KSSP Annual Reports from 2000 to 2007

Sasthragathi covers almost all aspects of pure and social sciences and their influence on society. It is through *Sasthragathi* that new perspectives and innovations in science domain are firstly disseminated in Malayalam. The three dominant areas covered are physical science, social sciences and development issues (See Table 1.6).

Table 1.6: Content of *Sasthragathi* from 2004 to 2007

Subject area	2007	2006	2005	2004
Physical Science	13	14	14	12
Natural Science	15	06	12	07
Technology	02	06	10	08
Health	05	12	04	11
Social Sciences	18	08	13	07
Agriculture	09	13	04	12
Gender	07	04	01	06
Development	12	24	16	21
Others	19	13	26	16

Figures denote number of articles published

Sources: KSSP Annual Reports from 2004 to 2007

The data shows that there is no uniformity or structured patterning in covering branches of knowledge across the years. However, almost all areas of science are being covered in one or other way.

Sastra Keralam magazine

After the success of *Sastragathi*, KSSP launched its second monthly magazine, *Sastra Keralam*, (Scientific Kerala) on June 1, 1969. Its target group was adolescents and young adults in the age-group from 15 to 20 years. P.T. Bhaskara Panicker was the editor. This 48-page magazine, priced at 50 paisa, was launched by the then Education Minister of Kerala C.H. Mohamed Koya.

The first editorial itself declared that the objective of the publication was to popularize science and create scientific temper in the life and thought of the young generation. Now it caters to their scientific information needs of high school and college students. Its circulation is growing every year from 2005. See Table 1.7.

Table 1.7: Circulation of *Sasthra Keralam* from 2003 to 2007

Year	Number of copies (monthly average)
2003	6500
2004	6500
2005	6800
2006	7700
2007	8200

Sources: KSSP Annual Reports from 2003 to 2007

Eureka magazine

The third periodical publication is *Eureka*, a children's magazine. It was first published on June 1, 1970 under the editorship of Dr. K.N.Pisharodi. At first, it was published under the auspices of the Thrissur district committee of KSSP. As stated in its first editorial, the objective of the magazine was to generate a scientific outlook in the minds of the children studying in all schools in the State. Now it is published twice a month. Content focuses on middle school science curriculum. Details of its circulation are given in Table 1.8.

Table 1.8: *Eureka* circulation from 2003 to 2007

Year	Number of copies
2003	18950
2004	18400
2005	18500
2006	19800
2007	21300

Sources: KSSP Annual Reports from 2003 to 2007

From the foregoing discussion it emerges that science has been redefined itself over the years, offering more possibilities as well as challenges to innovators, practitioners and communicators and the society at large. Science is no longer confined to laboratories and scientists; it is well ingrained in the complex milieu of politics, economy and governance. The growing demand for democratization of information and transfer of science information coupled with the media boom and the changed information acquisition patterns have made science the locus of modern society dynamics. There is a growing concern that any country, which moves forward without a scientifically informed citizenry, would jeopardize its own future in the globalization scenario where transnational dissemination of scientific knowledge and diffusion of innovations are at an electric speed. The concept that the civic scientific literacy and resultant public engagement in science and technology are inevitable to formulate and legitimize any national policy which emphasizes scientific advancement is getting momentum among political leadership. Along with these, the emergence of people's science movement has also helped bring science communication to the central stage of the present-day political and developmental discourses.

It is recognized that the role of people's science movements in popularizing science is as important as that of mass media and government agencies. In some social contexts, they can excel both. Cultural proximity, innovativeness and informal organizational capabilities are the reasons for their success in most cases. However, it is doubtful whether the potentials of people's science movements are tapped sufficiently and studied seriously.

Science communication among the rural folk is yet another overlooked area. The reason is that science popularisation activities through mass media and governmental channels have remained directed to the urban lot, who are privileged with high-end information sources. In such a situation, people's science movements have a vital role to play in rural areas.

Several studies on science popularisation, especially those of recent times, have recognized the power of the audience to selectively choose and use media content. In this context, improving the potential of selectivity of science popularisation media becomes a major task. Here it is worthwhile to note that media selection and subsequent impact of communication are determined by audience perception of the media, their content and controlling agencies. This necessitates identification of user's perceptions and their association with the media use and the extent of subsequent effect on the understanding of science. An understanding of those factors will help evolve better strategy for science communication.

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