

Scientific Consciousness and Social Change in Puducherry: A Historical Perspective

Sukalyan Gain

Guest Faculty, Department of History, Kanyashree University, Nadia, West Bengal, India

Abstract:

After India's independence, several science organizations emerged in India. These science organizations actively promoted scientific awareness, environmental conservation, and engaged in various social movements. Basically, the Science Movement has become a role-model to other science organizations, working in the domain. Within the larger context of the working domain of 'science for society', the Pondicherry Science Forum (PSF) was established in Puducherry in 1985. The social and economic structure of this small union territory of India was still largely dependent on agriculture and limited educational opportunities. In this situation, a group of young scientists, teachers, and social workers believed that science was not limited to laboratories—instead, it was a powerful means of social change. The main goal of PSF was to combat poverty, illiteracy, and social backwardness through the application of science. The founder members of PSF firmly believed that science was not just knowledge; it was a kind of social conscience. This scientific temper can inspire the ordinary person to think rationally and critically. This idea later became the basis of all their activities. They define themselves as "a non-profit, voluntary, and public interest organization" whose mission is to incorporate science into policymaking and promote scientific literacy and rational thinking in society.

Keywords: Pondicherry Science Forum, Science Movement, Science for Society, *Arivoli Iyakkam*, *Kalajatha*, Scientific Temper.

Introduction:

PSF participated in the larger stream of the Indian science movement; it was associated with national-level organizations, such as the All-India People's Science Network (AIPSN). Its goal was to take science beyond the elite circle and connect it with the real problems of people's lives—such as health, education, energy, and the environment. This vision guided their programs. One of the most critical chapters in the history of the Pondicherry Science Forum began in 1989, when the organization jointly launched a large-scale literacy program with the Department of Education, Government of Puducherry. The program was named *Puduvai Arivoli Iyakkam*—meaning 'Movement of the Light of Knowledge.' The name is both symbolic and reflective of the core philosophy of PSF: knowledge is the key to liberation. This literacy

*Corresponding Author Email: sukalyangain1@gmail.com

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campaign was not limited to providing literacy. PSF turned it into a comprehensive social reconstruction project. Its goal was to empower the marginalized and deprived sections of society through education, enabling them to improve their quality of life and apply scientific knowledge and logic in their everyday decisions. To this end, it developed educational materials, formed teams of trained volunteers, and conducted mass education camps at the neighbourhood and village levels. The scope and organizational structure of this movement was unique. Thousands of volunteers were involved, including many teachers, students, and homemakers. PSF developed this program as a ‘people’s campaign’, making literacy not just a means to meet administrative goals, but a form of social awakening.¹

In 1992, UNESCO gave international recognition to the programme through the King Sejong Literacy Prize. The success of the Pondicherry Science Forum (PSF) shows that a true revolution in education is possible when social consciousness and scientific minds come together. After this unprecedented success of Pudubhai *Arivoli Iyakkam*, the Pondicherry Science Forum quickly gained national recognition. In 1994, the Department of Science and Technology (DST), Government of India, awarded the PSF the National Award for “Best Science Communication Programme”.

PSF's efforts went beyond promoting science and education; over time, the members of PSF shifted their attention to renewable energy, sustainable development, and healthcare. They initiated several initiatives to encourage the use of renewable energy sources, including solar power and biogas, as well as the development of alternative energy systems, through the Centre for Education and Research in Development (CERD). For the effectiveness of this initiative, they received special recognition from the Renewable Energy Agency of Puducherry (REAP), a government agency. However, the most significant international recognition in the history of PSF came in the field of public health. Their community-based health program 'Arogya Iyakkam' was later ranked among the top ten community health programs in the world by the World Health Organization (WHO). The main objective of this initiative was to encourage active participation of local people in their health-related decisions, raise awareness of primary healthcare and maternal and child protection, and establish health as a social right. All these activities combined to make PSF an organization that demonstrated science not just as textbook knowledge, but as a tool for human liberation. Focusing on these four areas—education, science, health, and power—they initiated a new chapter in the social history of South India, where the people-oriented science movement had a profound impact on every level of society.

Background, Challenges and Literacy Movement Context

The role of the Pondicherry Science Forum in the literacy campaign was crucial. But the journey was not easy. By the 1980s, the KSSP had already become a mass movement, but the Science Forums in Pondicherry and Tamil Nadu still operated with a minimal membership. Their activities were primarily confined to urban educators and academics. According to J. Krishnamurthy,² a teacher in Pondicherry and a long-time science and literacy activist, people were drifting away from the science movement and new ideas, and a gap was emerging between the people and the Forum. At that time, the Forums planned to use the literacy movement as a tool to reach out to the people. Kerala already had a high literacy rate and a strong communist tradition, and the Tamil thinker M. Singaravelar had tried to combine scientific intellectualism

and working-class politics in the early 1990s. But after the mid-century, the dominant parties in Tamil politics were largely people-oriented and critical of caste-based discrimination, which left limited scope for the internationalist activities of the upper-caste Science Forum. In the late 1980s, before the literacy movement, although Forum workers had been promoting scientific ideas in villages through slideshows, scientific experiments, and posters, public interest was very low, and most people could not even read the posters. At this stage, the primary goal of the Forum was to foster closer ties with the people and lay the groundwork for expanding literacy and scientific awareness.³

The National Literacy Mission (NLM) was established in 1988 to reorganize and strengthen adult education programmes so that they become a mass movement for the general public. The projects and voluntary initiatives of the previous decades were often ineffective in eradicating illiteracy among the masses. In this context, in 1989, the Kerala Sastra Sahitya Parishad (KSSP) sought financial support for a mass literacy campaign in Ernakulam, which came to be known as the 'Total Literacy Campaign (TLC)'. International experience shows that literacy can not be achieved simply over time; it is possible through conscious, organised, and participatory efforts of the masses. The innovative feature of TLC is that it covers all illiterate people in a specific geographical area within a specified time frame and relies on the active participation of local people as its mainstay. These campaigns are run voluntarily and are implemented through the formation of independent organisations at the Panchayat, Block, District, and State levels, taking into account local social, economic, and linguistic conditions. However, to ensure success, it is essential to prevent illiterates from slipping back into illiteracy. Studies indicate that individuals can become illiterate again within months if they don't practice reading and writing. Tanzania's experience shows that literacy can be sustained through mobile libraries, village newspapers, and engaging textbooks. In this context, the progress of the literacy movement in four regions of South India—Puducherry Union Territory, Pasumpan Muthuramalinga Thevar and Pudukottai districts (Tamil Nadu), and Nizamabad district (Andhra Pradesh)—has been monitored. Based on the information obtained through a field visit in June 1992, strategies and directions for the next literacy stage have been identified. This experience shows that literacy is more than education; it is a vital tool for social awareness and empowerment.⁴

Puduvai Arivoli Iyakkam: Formation, Expansion and Structure:

After Ernakulam in Kerala, Puducherry became the second Union Territory in India to be declared 'Total Literacy', effective from November 1991. About 67,000 people between the ages of 15 and 40 in the Union Territory were covered under the Total Literacy Campaign, of which about 60 per cent were women. In May 1989, the *Puduvai Arivoli Iyakkam* (PAI) literacy campaign began in Puducherry, evolving into a strong community movement by March 1990. It was a collaborative effort between the Pondicherry Science Forum (PSF) and the Education Department of Puducherry. Although Puducherry is geographically small, the aim was to spread the light of education to all levels of society. The campaign was formally inaugurated on September 8, 1989 — International Literacy Day — with a grand rally and public meeting. At that time, the number of illiterate people in the Puducherry district was over 102,000. Although the literacy rate in the region was much higher than in most other areas, there was no

effective organization for mass education. There were also problems with the administrative structure, as the absence of a Panchayat system made it challenging to create a participatory structure with the local community. The primary objective of the campaign was to raise public awareness.⁵ This work was carried out extensively, including large public meetings, 'Kala Yatra' or cultural processions, and 'Padayatra', where volunteers travelled from village to village to educate the people about the importance of literacy. Ten cultural groups spread the message of education through about 1,500 exhibitions. The Pondicherry Science Forum established literacy committees at various levels, engaging local youth clubs, women's organizations, and teachers while providing training and assigning volunteer responsibilities. They acted as key resource persons, master trainers, and instructors, and were prepared to teach the 3-stage integrated primer. Approximately 13,000 volunteers participated in and were trained for this process.

Two types of structures were established to ensure the active participation of society in this plan. On the one hand, people's committees were formed at the village, commune, and district levels, in which the villagers, volunteers, and local representatives participated; on the other hand, a collaborative network was created between the education department, government departments, voluntary organizations, political parties, and workers' organizations. Of the four districts, the Puducherry district was the core area of the project, where central work was conducted to build training and gain experience. The other three districts — Karaikal, Mahe, and Yanam were also included in the campaign, although they were culturally distinct and smaller in terms of population. At that time, fatigue, suspicion, and political division prevailed in society, hindering the gathering of information and participation. After the assembly elections on February 26, 1990, the process of forming unified committees at the village and commune levels almost collapsed. The public opinion and environment building that had already been formed had to be started anew. The activities were resumed on 31 March 1990, and this time the environment building was arranged more attractively and actively. As part of the environment-building efforts, village conferences, block and tehsil conferences, *Kalajatha* production camps, training of volunteer artists, literacy festivals, Arivoli rallies, school *padayatras*, village convener meetings, booster *jatha* movements, celebrations of International Literacy Day, and the Bharat Gyan Vigyan Samiti's campaign were included. The aim of these activities was not only to introduce literacy but also to promote educational consciousness and awareness in society's lifestyle. This initiative was a form of social reconstruction movement, where, through education, people were motivated and opportunities were created to achieve freedom and dignity.⁶

Training, Participation and Implementation

The main driving force of this campaign was the experienced scientists of PSF, known as Key Resource Persons (KRPs). They had long been associated with the mass education movement and the popularization of science. Most of them worked as school teachers or science assistants, and also had the necessary language skills. Two preparatory meetings were held in January and March 1990 — first with about 350 people in four regions and later with 80 workers. During these meetings, the basic plan for Training Master Trainers (MTs) and volunteers was formulated. However, in practice, many of the MTs showed no enthusiasm for this work. Some

discouraged the students. For this reason, the MT level was gradually eliminated and direct training of volunteers was started. Approximately 10,000 volunteer teachers participated in the project, comprising 7,000 women. There were students and youth. Most of them came from the lower middle class, and some were unemployed or engaged in temporary work. Their motivation was to establish their rights through education and to become part of a social movement. Despite political resistance, social skepticism, and discouragement from school teachers, these young female volunteers became the lifeblood of the project. Initially, PSF relied entirely on the State Resource Centre (SRC) in Madras for Training, but it was highly theoretical, book-based, and out of touch with the realities. As a result, PSF KRPs began to develop training materials and methods on their own, tailored to the local context. A three-day training programme was adopted for MTs, which covered literacy needs, adult learner psychology, training practices, and evaluation methods. Two major training camps were held in May and August 1990—the first with 10,000 volunteers and the latter with 8,000. Although each camp was three days long, in practice, it could not be followed consistently in many cases. The first day of the discussion centred on the philosophy of the Arivoli movement and the mental preparation of the students, the second day on textbooks and strategies, and the third day on organization and motivation. Two handbooks were prepared as training materials — one for the primary level and the other for teaching strategies at the second primary level.⁷

The training methods used included group discussions, song and drama presentations, lectures, demonstrations, and teaching exercises. But there was an apparent lack of experiential or participatory learning methods. Yet, approximately 90,000 illiterate individuals participated in the initiative, with around 50,000 completing the course. Of the 12,000 volunteers trained, 8,000 remained active for more than six months, and 3,000 managed to stay involved for the long term. This level of expertise and participation made the project a touching social example. Although the project achieved many successes, reality still revealed several limitations. The ineffectiveness of village and community-level committees burdened the project on a few members. Many trained volunteers had to do administrative work, resulting in the use of less qualified teaching staff. The weakness of the MT level affected the entire training chain. The students' perspectives, life experiences, and real needs were not adequately incorporated into the teaching process. Again, opportunities for in-service training or further training were limited. As a result, the project's impact was not permanently embedded in any one place. Nevertheless, *Pudubhai Arivoli Iyakkam* opened a new horizon in the history of scientific temper, women's activism, and mass education in the Puducherry region.⁸

Crisis, Resistance and Lessons

In 1992, just two years after the launch of the *Arivoli Iyakkam* or 'Light Movement', the Pondicherry Science Forum found itself in a deep political crisis. This movement for literacy and scientific awareness had created a new social force in rural Puducherry, where people were approaching local literacy workers instead of political representatives with their problems. This caused concern among both the ruling and opposition parties, because politics, for so long their exclusive sphere of influence in rural society, was now being challenged by the light of science and rationality. One of the movement's leaders, Sundararaman, later recalled that more than twenty thousand people attended one rally, something no political party had ever done before—

and the local leaders were horrified by the huge turnout. Journalist Nithya Rao noted⁹ that one of the lessons in the Arivoli campaign's literacy primers discussed poverty, unemployment, and wealth inequality in India, calling for a just society. This lesson was used to describe the movement as 'anti-national' or 'subversive' in the Puducherry Legislative Assembly, calling it 'anti-state'¹⁰. The two rival parties, Congress and DMK, then joined forces to stop government support, and the post-literacy phase of the movement came to a halt midway. But despite government obstacles, the Science Forum did not deviate from its goal. Although it severed formal ties with the government in the mid-1990s, the Forum's workers continued to handle almost all the responsibilities of *Arivoli Iyakkam*. Literacy then became not just literacy, but a tool for developing a sense of reason, self-criticism, and a scientific mind in society. They would visit villages and teach physics concepts through simple experiments, show them the universe through telescopes, and explain the intricate world of life through microscopes, all while presenting scientific explanations behind 'miraculous' events, so that people would understand that superstitions are actually a form of deception. Their campaign, called "Mantirama? Tantirama?"—meaning "Magic or Trick?"—became very popular. Every year, on the day of the atomic bombings of Hiroshima and Nagasaki, public meetings were held calling for the use of science for the benefit of humanity, not for war and violence. Their main motto was—"Building a scientific culture based on the traditions of the freedom struggle, democratic, socialist, and women's movements." J. Krishnamurthy, one of the leaders and teachers of the Forum, later said, "People do not get any scope to understand what is happening around them—they only believe what they watch on TV or in the newspapers. But if they discuss these things together, then only will they understand what is right, what is wrong, what is necessary. So we need a structure where this understanding is possible."¹¹

The experience of the Arivoli movement has been a profound and inspiring journey so far. When the proposal for this programme was first taken up, it was an almost impossible dream—because it was a bold initiative to implement a massive project of approximately 81 lakh rupees. Yet, a dedicated organization like the Pondicherry Science Forum made the impossible possible. The response of the National Literacy Mission was also swift and positive. Even before the financial assistance officially arrived, the movement workers organized training camps, carried out mass rallies, and spread awareness among the people in the villages. The response of the people to the movement, the cooperation of local organizations, and the enthusiasm of public involvement grew to such an extent that the movement's progress gained new momentum.¹²

This experience has taught the Pondicherry Science Forum and the administration many lessons. First, it demonstrates that an incredible amount of work can be accomplished in a short period with a group of dedicated and idealistic people. Second, it has been proven that ordinary people are trusted and listened to. Given the power and responsibility to make decisions, they can become the main driving force for social change. This experience has opened the eyes of many bureaucrats, as they have seen firsthand that the path to real development is not "dictation from above", but "participation from below". Thirdly, the Arivoli movement has given new life to the Adult Education Department of the Puducherry Government. The previously apathetic animators are now working in the field with confidence and enthusiasm and taking pride in their role. The dedication and enthusiasm of the young Jatha members are commendable. They

have transformed this initiative into a ground breaking effort to promote literacy and mobilize social forces, demonstrating that effective planning and active participation are crucial to success. Each step needs to be thoughtfully planned, but at the same time, there must be a mindset of admitting one's mistakes—where changes can be made if necessary, new directions can be sought. And finally, this experience has shown that government involvement does not destroy the spontaneity of mass movements. If adequately supported, the government can provide essential workforce, infrastructure, and expertise for the movement. Its role should be as a facilitator, enabling people to make and implement decisions. The Arivoli movement showed that path: how people's power, scientific mindedness, and social responsibility can come together to initiate a historic transformation.¹³

Government Role, Wider Impact and Other Campaigns

In terms of the government being an active and integral partner, the Arivoli project largely follows the model of the Kerala Sastra Sahitya Parishad's Ernakulam project; however, its structure, implementation, and the government's role differ somewhat. Fortunately, the Arivoli proposal came at a time when the Education Department of the Puducherry government was in the process of re-evaluating the effectiveness of its adult education programs and was trying to make the process more well-organized, goal-oriented, and mass-oriented. In this context, the Arivoli proposal was naturally acceptable, and the government readily approved it. However, its main difference is that the government's adult education wing has been fully involved in the programme, acting as an integral part and providing the infrastructural base of the project. The main thrust or aim was to familiarize government adult education workers with the work in the form of a mass movement and to fully involve them in achieving the goal of educating all illiterate people within a specified time frame. This was not easy, as they were previously accustomed to teaching a limited number of students each year, with no promotional support, monitoring, or well-organized structure to guide long-term goals. This led to doubts among some teachers about job security, the nature of the work, and long-term goals, and many of them initially considered resigning. However, over time, through training, discussions, personal contacts, and intensive support from the staff of the Pondicherry Science Forum, they were able to engage fully in their work, and some capable and strong leaders emerged within the project. The Arivoli project enabled the integration of adult education animators as a central part of the movement, where they became members of the executive committee, commune-level coordinators, and played a key role in preparing primary education textbooks or primers. This initiative is considered one of the most significant achievements of Arivoli, as adult education workers in government and non-government organizations often view mass movement efforts as a critique of their previous work. But the Arivoli project has proven that an effective mass movement against illiteracy is possible when active government participation, public involvement, planned Training, intensive coordination, and implemented efforts at all levels come together, which will serve as an essential learning example for mass education and social change not only for the Puducherry region, but also for other parts of the country.¹⁴

The organizational strength and social consciousness that PSF generated despite administrative complications and political resistance later became an essential example for literacy campaigns

in other states of India. Based on the PSF model, literacy missions were launched in several Indian states.

In 1992, the *Sakshar Muzaffarpur* literacy campaign was launched in Muzaffarpur, Bihar, aiming for 80 percent literacy among those aged 12 to 35. The project also promoted universal vaccination, expanded primary education, and included employment initiatives. In 1990, several meetings were held jointly by Kerala and BGVs, and a draft of the campaign was prepared. The campaign outline clarified the process of creating an environment, selecting volunteers, involving women, and managing the campaign. The entire project was divided into three cycles, each lasting six months. Teachers and students created awareness through fairs, debates, and creative activities. Initially, three days of Training for trainers and seven days of volunteer training were planned. Still, in reality, it was limited to three days, and the total implementation was only 14–15 hours. In such a short period, the scope for practical training and teaching practice was minimal. The needs and awareness-raising of female students were not included in the training list. Due to administrative haste and weak planning, the training process often became mechanical. According to statistics, approximately 60 to 80 percent of the volunteers were from backward castes and communities, and about 25 percent of the students dropped out midway. About 90 percent of the volunteers considered their training could not be applied to teaching. The project monitoring system also could not work effectively, resulting in a gap between training and implementation.¹⁵

The literacy drive in Durg district of Chhattisgarh (then Madhya Pradesh) began in 1990. The population was approximately 2.4 million, and the literacy rate was very low, at 47.92 percent, with male literacy at 60.64 percent and female literacy at 34.88 percent. In May 1990, the Bharat Gana Vigyan Samiti (BGVS) formed a District Literacy Committee, with the District Collector as its president. The activities were formally launched in September. The drive involved three levels—administrative, organizational, and academic. In the first phase, 90 KRPs and 99 RPs were selected. Out of them, 72 were RPs who trained MTs. Subsequently, a total of 2,284 MTs and 37,368 volunteers were trained, with approximately 30 percent being women. The training program was expanded from the district to the block in stages. Each RP trained an average of 25 MTs, and an MT trained an average of 30 volunteers. On average, each teacher-volunteer was asked to teach eight students. Although the training was extensive in number, in reality, many trainees failed to acquire the skills. There was no special training program for project managers, and no separate training was conducted for women. The contents of the training did not include population education and social issues, which later emerged as a significant shortcoming. The experience of these three campaigns paints a realistic picture of the mass education movement in India. Each initiative began with enthusiasm and a broader social vision, and people from diverse social strata—teachers, students, farmers, women, government workers, and volunteers—participated together. However, limited support from the authorities, weak training structures, funding, monitoring, and a lack of women's participation hindered the success of these initiatives. Due to administrative complexity, the programmes often became blue-collar, and the participatory structure gradually weakened. In addition, the lack of quality Training and appropriate content created inherent limitations. Amidst these crises, the social impact and knowledge development phase of these campaigns was critical.¹⁶

Conclusion

PSF played a significant role in popularizing science among children. The All India Children's Science Festival was held from November 14 to 19, 1989, at Jeevanandam Government Higher Secondary School, Puducherry. It was a unique and comprehensive initiative aimed at promoting scientific consciousness, creativity, and environmental awareness among children. The entire organization and direction of the festival was taken up by the Pondicherry Science Forum, which has been playing a leading role in promoting science education among children and increasing public awareness in Puducherry for a long time. The festival was implemented under the patronage of the Ministry of Human Resources Development, Government of India, the Department of Education, Puducherry, and Indian Bank. The primary objective of the six-day festival was to provide hands-on scientific experiences to children from various parts of the country, to enhance team participation and leadership skills, and to connect scientific education with cultural and social activities. The 'Learning is Fun Corner' programme for children taught physics, chemistry, mathematics, geometry, electronics, and health concepts through various fun, creative, and practical activities. In addition, origami, painting, puppetry, drama, music, and sports activities were included to develop the children's imagination and creativity. The activities built self-confidence, teamwork, and social awareness among the children. The festival provided a fun learning environment that enhanced their problem-solving skills. On November 16, the children enjoyed a beach assembly and coastal walk, followed by discussions on botany, zoology, and environmental awareness. On November 17, guest speakers, fun corner activities, and educational games encouraged team participation and creative thinking among the children. On November 18, cultural rallies, drama, music performances, speeches by chief guests from universities and local education systems, a memento release, and a felicitation ceremony for special guests were held. The festival wrapped up on November 19 with group discussions and feedback. Over six days, it provided children the opportunity to learn scientific concepts while promoting creativity, leadership, teamwork, environmental awareness, and social responsibility. Led by the Pondicherry Science Forum, the festival has gone down in history as a unique educational and cultural initiative for children in Pondicherry, making a significant contribution to creating a long-term impact by integrating scientific learning with fun.

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campaign. This study focuses on Training strategies and related issues in the Puducherry district, one of the four districts in the Union Territory of Puducherry. The remaining three districts—Karaikal, Mahe, and Yanam—being relatively small and culturally distinct, had different realities. Most of the data for this study was collected through interviews with members of the Bharatiya Janata Science Society (BGVS) and the Puducherry Science Forum (PSF).

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