

# Science for the People: An Overview of the Development of Scientific Consciousness in Jharkhand

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**Abstract:** *After independence, some science organizations were formed in India, whose main aim was to popularize science, develop scientific temper, and promote science and technology to improve the living standard of all people. Along with that, some organizations feel that the state cannot prioritize the needs of the ordinary people, and they try to determine the people's priorities. They even play the role of pressure groups on the government so that it implements its science policy for society. These science organizations played a significant role in expanding science consciousness among the people. The proposed research paper will highlight various aspects of the history of the work of science organizations in Jharkhand in the science movement.*

**Keywords:** Rohini Science Club, Scientific Temper, Jharkhand, All India Science Club, UNICEF Bihar.

In recent times, science and technology have made significant advances. The advancement of science has fundamentally altered how perceptions and living styles of the masses. Nonetheless, how much scientific understanding general people have within them is still a pertinent question. Superstitious beliefs are still persistent in today's world. We come to know about these things from print media as well as digital media. Even today, there is no expansion of scientific sensibility and awareness among particular individuals. After independence, many states of India established science clubs to increase public awareness of scientific issues. Scientific organizations investigated a novel way of life by cultivating a scientific environment. The history of science club activity in East India, including West Bengal, Assam Bihar and Jharkhand, sheds additional light on the issue.

The science club mentioned in the proposed research paper was founded in Bihar but is now in Jharkhand. Three new Indian states came into existence in the year 2000. The hilly areas of the north-western region outside of Uttar Pradesh make up Uttarakhand. Chhattisgarh separated from the eastern portion of Madhya Pradesh. In the southern part of Bihar,

numerous tribal groups lived in forests. The region is mineral-rich but faces innumerable obstacles. Jharkhand broke away from Bihar and established itself as an independent state in 2000, after several protests leading up to this point.<sup>1</sup>

During the 1970s and 1980s, numerous science clubs were established in various Indian states. A science club was established in Ranchi, Bihar (now Jharkhand) in 1973. Several students in ninth- and tenth grades took the initiative and started making various scientific models to spread awareness among the masses. Students continued to participate in state and national-level science exhibitions in Kolkata and Delhi by creating multiple electrical items and gadgets. Their works were highly regarded in all of these locations. Later, the students established a science club in Ranchi to exhibit their models. On March 15, 1973, following the terms of the constitution, the Rohini Science Club was established. Later, members nominated an executive team to run the club. Finally, in 1984, the club registered under the Societies Registration Act.<sup>2</sup>

The resolution was taken to run the science club with the goals mentioned below<sup>3</sup>:

- To bring the progress of science and technology to the doorsteps of all members of society.
- Encouraging young people to use science and technology in their daily lives.
- To encourage students in schools, colleges, and other educational institutions to be interested in science, to think about it, and to do research.
- To promote innovative ideas and projects.
- To instil a passion for science and technology in educators and the general public. Concentrating on progressing, advancing, and developing.
- To attempt to eradicate superstition through formal scientific education.

During its early stages of development, the Rohini Science Club created a program for rural development in the surrounding area while keeping the issues mentioned earlier in mind. To make it more appealing to people living in rural areas, efforts are made to provide them with simple scientific equipment and instil scientific knowledge. The second most important task taken by this club was to support the rural people in their essential aspects of sustenance such as cleanliness, way of life, speech, money management, and safety. Amenities that would make their daily life easy were made available by using limited technological resources. Later, the club decided to build a number of science centres for kids in the adjoining rural areas. This project aims to make easy access to classes on basic ideas of science for rural kids.<sup>4</sup>

In the following years, Rohini Science Club has also begun a *Mobile Science Home* program to increase interest in science among the general public and schoolchildren. It was a part of one of their well-chalked-out

initiatives to improve the living of the rural people who often have to face impediments due to lack of access to modern scientific developments. This is an intriguing step taken by the Rohini Science Club. This could be achieved by exhibiting science models in several states. This no doubt helped to improve the lives and livelihood of many. This *Mobile Science Home* brought various scientific models to different rural communities. The public life enhancement and increased enthusiasm for this 'science giant' were other successes of their project.<sup>5</sup> With all options in mind, this group runs some initiatives aimed at helping our most disadvantaged citizens. A room away from Ranchi has also been set up for model making. Editor GVSR Prasad said, "We want to work with regular people and other science clubs to implement our rural development program and make this country scientifically literate."<sup>6</sup>

Following India's independence, science clubs took on several anti-superstition initiatives and broader campaigns to promote and publicize scientific knowledge. As you go along, you'll encounter a wide range of challenges. The All India Science Club Conference was held on August 14th and 15th, 1979, at the Gobardanga Renaissance Institute. The conference's purpose was to look at the problems at work. The conference sought to pave the way for future joint activities through discussion and exchange of ideas between these clubs. The goal is for science clubs to work together and create a positive atmosphere for their members. Another goal is to look back at what those Science Clubs have accomplished over the past two decades across West Bengal and the rest of India. Despite inviting 120 science clubs, only 32 showed up to the conference. The Rohini Science Club of Ranchi, Bihar (Jharkhand) was represented at this conference.<sup>7</sup> The second All India Science Club Conference occurred in Nabagram, Hooghly district, West Bengal, on December 27 and 28, 1980. The central theme was "The Function of Science Clubs in Promoting Science Education." There were 56 different Indian science clubs represented at the event. On behalf of Rohini Science Club, GVSR Prasad highlighted the growth of science clubs in Bihar. It also describes the science club's efforts to combat illiteracy and unemployment in rural parts of Bihar. He also pushed for the establishment of Science Clubs all over East India.<sup>8</sup>

The Fourth Annual Conference of the All India Science Club was held in 1982 in Krishnanagar, Nadia District, West Bengal, at the initiative of the Eastern India Science Club Association and the Nadia District United Science Association. The details of Rohini Science Club's work over the last ten years were discussed at this conference. Rohini Science Club Secretary SC Agarwal said that the club had hosted events like an 'Inter Word Power contest', 'Quiz test', 'Essay competition', 'Current inventions and achievement', and 'Complete the electric circuit contest' over the previous year. Besides, we host seminars, roundtables, debates, and project studies, among other activities. The scientific community creates significant models, including (i) A machine to sort corn. (ii) An electronic blood-level indicator. (iii) A system to disseminate newspaper ads. (iv) Electrified directional

indicators (v) Accident Prevention Devices (vi) Constant access to oxygen for patients (vii) The Public Switched Telephone Network (viii) The Human Central Nervous System (ix) Electric watch (x) Solar-powered hot water systems, among other uses. Some booklets are published to highlight various issues among the people and students, such as, -i) Activity circular, ii) RSC developments, iii) Annual report & magazines, etc.<sup>9</sup>

The initial focus of the Rohini Science Club was squarely on model building. After attending the first International Science Club Conference in West Bengal, the Rohini Science Club participated in the Rashtriya Val Vaigyanik Pradarshani<sup>10</sup> in Delhi in 1980. Roughly two hundred scientific role models were chosen from East India. Two models belonged to the Rohini Science Club among these 200. It was widely acknowledged that the electronic regulation model for reducing traffic accidents was superior.<sup>11</sup> Students took the initiative to design brand-new models after the Delhi exhibition. The Rohini Science Club has created some valuable inventions, including a radio-controlled rocket launcher, a solar-powered water heater, an easy way to pack bottles, an electronic timer for regular supply of oxygen to patients, a chair cum sleeper for the disabled, a corn segregation machine and much more.<sup>12</sup>

The Rohini Science Club received recognition for their efforts at the 1981 State Level Science Exhibition in Patna. The State Council of Educational Research and Training, Bihar,<sup>13</sup> and Shrikrishna Science Centre<sup>14</sup> collaborated to organize this exhibition from November 14–17, 1981, at Shri Krishna Bhavan in Ranchi. Eighteen districts across the state yielded 75 models for selection. The award went to the model designed to accommodate people with disabilities.<sup>15</sup>

At the International Youth Fair held in Tokyo by the Japan Research and Innovation Institute in 1985, two models created by members of the Rohini Science Club won awards. One model was an electronic light indicator to prevent traffic accidents; the other was an electronic water tape. The models from Tokyo were displayed at the International Youth Exploration Fair at the Y.S.C.A (Young Men Christian Association) in Ranchi. Mr. Nayek, the general secretary of the Y.M.C.A., opened the exhibition. The International Youth Exploration Fair's primary objective is that youth from various countries can work together to share information and learn about science, technology, and cultural development and transformation. Additionally, they forge friendships with people from other nations and gain knowledge of their languages, cultures, and ways of doing business. Father Debravar appreciated both organizations' efforts. He praised the Rohini Science Club's efforts to get students interested in science and hoped that the way people in Tokyo found out about the club would help people learn about other parts of their work in the future. Director of the Rohini Club G.V.S.R. Prasad elaborated on the models displayed at the exhibition. This exhibition also features the Digital Clock, Digital Scoreboard, and Graphic Equaliser models the Rohini Science Club created.<sup>16</sup>

On January 15, 1989, at the initiative of the Rohini Science Club, a

science camp was organized on the significance of receiving a scientific education in one's day-to-day life. GVSR Prasad, the founder and president of the Rohini Science Centre, went into detail about the goals and intentions of the seminar. He said, "Science education needs an open environment like equipment and laboratories." Studying science in books and putting what you learn into practice is paramount. The only way to instil in students a genuine appreciation for science is to teach it in contexts outside of the classroom, unconstrained by prescribed lessons. Teachers should also adopt their viewpoints, keep an open mind, and foster children's natural curiosity.<sup>17</sup>

The science we require in today's world to give our lives meaning is all around us. They have a requirement to be observed and recognized. The Rohini Science Club held a cycle rally in 1989, intending to accomplish this goal. A group of fifteen students from the Rohini Science Club organized a rally to promote science in Khunti, Tamar, Bundu, and Tati communities from March 15 through March 18. The students travelled to these locations on bicycles. Students attending various schools in these regions are introduced to the fundamentals of different scientific fields. Additionally, actions are taken to cultivate interest in science among them by displaying a variety of science-related games. Club members of the club visited the local schools. They spoke to the students about the importance of understanding science's real meaning, the history of its many subfields, and the key figures that contributed to their growth. Students can only learn when they are connected to experiences and contexts that are relevant to their lives.<sup>18</sup>

Following the success of the March 15-18, 1989 rally, a science camp was organized to unite those schools. A hundred students from Khunti, Tamar, Bundu, Tati, and surrounding areas attended this camp, which was held from May 28 to June 8. The organizers of this camp took special care to ensure that the students who participated learned and understood as many practical things as possible. Throughout the centre, the working methods of all those associated with the venture are closely monitored. In this camp, students create their designs for a variety of projects. Some were creating educational materials, while others were creating science games. The projects included stars, flying objects and wind, weather charts, a compass, a barometer, a humidity meter, experiments with cold and hot water, speed and distance measurement, plant-related projects, etc.<sup>19</sup>

This science club is not limited to Ranchi, but it has worked to spread the scientific spirit throughout the surrounding areas. The Bihar government gave the Rohini Science Club the job of running the Regional Science Centre Ranchi, which was set up in the 1990s in partnership with the Bihar Council on Science & Technology<sup>20</sup> in Patna. This institution aimed to create a science museum, library, playhouse, and science garden where children could come freely and try to understand various aspects of science. As well as to awaken the scientific environment and the tendency of discovery among the nation's youth, develop models of demonstration

equipment and educational materials for the development of science education, and train teachers to develop science education materials. The Rohini science club fully supported this work.

Rohini Science Club and Regional Science Centre Ranchi collaborated to host the first science camp in Deepatli, Ranchi, on December 27, 1989. This training camp at the Regional Science Centre Ranchi covered the need to protect the environment. The significance of plants, soil, water, air, and other natural resources in daily life is highlighted in various ways. The camp included nature observation so that regular people could get in touch with nature. The Rohini Science Club staged several plays at this camp to raise awareness.<sup>21</sup>

In collaboration with the National Council of Science and Technology Communication in New Delhi and the Bihar Council of Science and Technology in Patna, the Rohini Science Club promoted scientific awareness. In the mid-1990s, fifteen enthusiastic members visited schools in remote rural areas. Members of the Science Group conducted fascinating experiments in various schools on air, water, magnetism, the environment, electricity, light, machines, and instruments. Teachers, in addition to students, attended this training. "What exactly is science?" What are scientific theories? An exhibition comprising fifty posters about the topic was set up and attracted significant attention. Road dramas are used to educate the general public about issues such as health, education, and water.<sup>22</sup> Later, on World Earth Day<sup>23</sup> (April 22), the Rohini Science Club visited various schools in Ranchi to emphasize the importance of environmental protection.

Rohini Science Club held some science camps to get people interested in science. They began their scientific journey by publishing books, pamphlets, and journals in the field of the organization. The main goal was to make science theories and facts accessible to the general public in simple, easy-to-understand language. Since the 1990s, Rohini Science Club has been publishing booklets and magazines. Over the years, they have set up several nature observation camps. To advance the base in the coming days, the organization published *Ecowatcher's Diary*.<sup>24</sup> Vivid and elaborate discussions are held on any environmental issues like water, air, land, and forest management. Information on how to save the environment from the surrounding areas of cities, villages, and forests is also thoroughly examined.

Rohini Science Club has done several activities to celebrate Science Day in the past few years. On National Science Day in 1993, a booklet called *Bijnanatsab*<sup>25</sup> was published. This booklet mentions the purpose and goals of Science Day for the general public and school students.<sup>26</sup> Such as-

- The scientific method helps enable technology, development, and life as well as for understanding the evolution of society and analyzing the current state of affairs in light of that understanding.
- Science isn't about knowing many things or having many definitions; it's about the things around us, our life systems, and our methods.

- The ability to perceive and comprehend the elements of our environment is essential for the scientific mind. It is also necessary to use it properly for one's and others' benefit.

• The primary goal of science is to answer questions raised by human curiosity using the scientific method.

*Jaiba Bibidhata's*<sup>27</sup> booklet was published in 1993 by the Rohini Science Club. This booklet for the average person analyses several biodiversity-related topics. Biodiversity is a subject that raises a lot of mysteries. The shapes and characteristics of living things have evolved along with the world. Sometimes, plateaus, other times vast oceans, and other times soaring mountains make up deserts. The weather is not the same everywhere because the Earth rotates for 24 hours. Consequently, plants or animals can't endure all environments.<sup>28</sup>

The science club decided to start publishing the magazine in 2005. *RohiniBarta*<sup>29</sup>, a science magazine, was launched on National Science Day, February 28. National Science Day's significance is appropriately discussed at the beginning of the paper. This issue mentioned the details of CV Raman's works.<sup>30</sup> After putting out only a few numbers, the magazine was closed.

The Rohini Science Club has collaborated with many scientific institutions since the 1990s. They are also attempting to develop scientific thinking through science camps. The work they do has advanced significantly since 2000. The organization made a significant move in 2008. Attempts to create an electronic version of the previous year's organizational documents made it simple for people to learn about the club's various activities.<sup>31</sup> On February 28, 2008, a panel discussion about Sir CV Raman's life was organised at the club office on National Science Day. School teachers and students participated in this discussion. Later, school teachers seek technical assistance to plan such events in schools. Additionally, teachers started science clubs in their respective schools.<sup>32</sup>

Over the past few years, the Rohini Science Club has taken several steps to save water. A rainwater harvesting project was developed on the organization's roof in 2008. It is accurate to say that this project will be carried out similarly in schools. The club promises to provide any components the schools require for this project. The Rohini Science Club lends a helping hand when the Centre for Science and Environment (CSE), New Delhi, implements a water conservation plan in Ranchi.<sup>33</sup>

The Rohini Science Club subsequently organized a workshop for schoolchildren to create 3D models of rainwater harvesting systems. Many homes, institutions, and industries in the country utilize rainwater harvesting (RWH) projects. The Rohini Science Club attempts to include this project in school-based development activities. In the workshop, 3D designing entails creating a cardboard prototype model and then displaying it step by step on an LCD screen. As a result, the organization provided kits for making such models to each school.<sup>34</sup> The Centre for Science and Environment, Delhi, produced a rainwater harvesting film for the program's

second phase. The students were questioned about the movie after the screening. Students discuss the issue with their principal and take the necessary actions to implement the RWH system at their school.

The summer capital of India, Ranchi, India has suddenly expanded into a major metropolis in recent years. Although there are many issues in the city, the drinking water issue is the most concerning. Many areas of Ranchi need access to safe drinking water. The extensive use of concrete and cement in high-rise apartment buildings has prevented the accumulation of rainwater on the ground. They are moving through numerous drains. The Rohini Science Club stepped up to address this crisis. In 2010, on World Environment Day (June 5), the club organized a bicycle rally with school students. The objective was to educate people about how to harvest rainwater.<sup>35</sup>

On June 5, more than 150 students from different high schools in Ranchi gathered with great enthusiasm and interest at Shaheed Chowk. The club has announced the planning of a rally to educate the public about water conservation. During the campaign, students spoke with roadside shop owners and members of their families to learn about rainwater collection techniques. In addition to demonstrating how to collect rainwater at their doorsteps, the members also showed them the pictures they had provided. People still need to be made aware of the benefits of rainwater harvesting systems. Most believed that significant financial investments were necessary for pipes and equipment. The Rohini Science Club and the students presented the topic to the public and developed specialized equipment.<sup>36</sup> The State Project Director of the MahilaSamkhya Society of Jharkhand requested that a 15-day program on women begin following this rally. The Rohini Science Club has created a comprehensive strategy to comprehend women. The Rohini Science Club camp is unquestionably a significant step towards resolving the water crisis and protecting the environment.<sup>37</sup>

Robotics has a promising future. The use of robotics in airlines, pharmacies, industry, defence, agriculture, and other fields is notable. On March 4, 2012, the Rohini Science Club and the Department of Science and Technology of the Government of Jharkhand organized a Robot Demonstration Workshop at Ranchi Science Centre.<sup>38</sup> The primary goal<sup>39</sup> was–

- Students in Jharkhand who are enrolled in technical programs must be made aware of the robot concept on a fundamental level before they can begin to apply it in the real world.
- Project-based training courses on robotics fundamentals.
- Providing technical assistance to various robotics organizations.
- Encouraging students from various institutions to pursue careers in robotics and other technologies.

A group of 15 people from the Robotics Society of IIT Kharagpur took part in this workshop. Shri Ram Shankar Chowdhury, Curator of the Ranchi Science Centre, opened the seminar. He spoke about the theoretical and



practical aspects of science.<sup>40</sup> The session began with an introductory video demonstration, and students from IIT Kharagpur then discussed how to build robots. They start with an overview of both wired and wireless robots. Modulation, encoders, decoders, transmitters, and receivers are thoroughly explained. A senior member of the Robotics Society uniquely describes computer-controlled robots. He also discussed coding with the Microsoft Visual Basic programming language. A special demonstration with automated robots followed. Students from Jharkhand were encouraged to attend to learn more about new technologies such as robotics. A thorough demonstration of constructing such a robot piques the student's interest.<sup>41</sup>

In collaboration with UNICEF Bihar<sup>42</sup>, Rohini Science Club began working with several organizations in 2017 to promote and protect children's rights. With the passing of the Right of Children to Free and Compulsory Education Act on April 1, 2010, every child has the fundamental right to eight years of quality education to learn to read and write with joy. The Rohini Science Club organized a teacher training session. The main goal was to include marginalized children who could not see the value of education through their teachers. The training started on August 29, 2017, at Haridas Seminary High School in Gaya at 11:00 AM. RS Singh (Consultant, UNICEF Bihar) entrusted two organizations to move this project forward. Children's athletic development is the responsibility of AKSHAYAM, and the Rohini Science Club is in charge of the remaining studies and science-based activities.<sup>43</sup>

Rohini Science Club began working with BalSansads, MeenaManch, and School Management Committees (SMC) to promote development and science-based practices through child education. Jyotish Prasad Sahu, Project Co-ordinator of Rohini Science Club, stated at the workshop on September 6, 2017, that new ways to improve student's learning skills must be found. To develop children from marginalized communities, GVSR Prasad requested that sports and science be prioritized to develop students' life skills and prepare them for a successful future through improved performance.<sup>44</sup> The Rohini Science Club's initiative continued. In 2018<sup>45</sup> and 2019<sup>46</sup>, he travelled to remote areas of Bihar to do such work for children's education.

In the last several decades, the 'Rohini Science Club' has performed various activities to promote scientific awareness in Bihar. Rohini Science Club is critical in developing students' creativity by sharpening their curiosity and expression. They have also published several booklets on various scientific topics over the last few decades. They have taken the initiative to publish their work by hand-making several models in books such as Aangan Ki Mitti, Bijli Ke Upkaran, Chalo Khele Kude, and others. In 2023, the Rohini Science Club celebrated its 50th anniversary. The success of their work unquestionably demonstrates that science cannot be contained within books. Science is for society and all classes of people who live in it.

**Notes & References (Endnote)**

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7. *Proceedings of All India Science Club Conference*, (Gobardanga: Gobardanga Renaissance Institute, 14-15 August 1979), p. 6
8. *Reports of the 2nd All India Science Club Conference*, 1981, p. 2. *94th All India Science Club Conference Proceeding Journal*, Calcutta: EISCA, 1982, p. 24
10. Since 1971, NCERT and UGC in Delhi have organized the National Science Exhibition for Children. The main goal is to promote, encourage, and awaken a scientific mindset in the nation's youth
11. *Ranchi Express*, 05.12.1980
12. 'Saga of Rohini Science Club,' *The New Republic*, 01.08.1981
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14. Shrikrishna Science Centre is a part of the National Council of Science Museums (NCSM) and an autonomous organization under the Government of India's Ministry of Culture. It was founded in 1978 in Patna and was named after Bihar's first Chief Minister (Dr. Shrikrishna Singh). With this "Science for All" goal in mind, they set up many programs for students to help them develop a scientific mindset through science education
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16. 'Ranchi Ke Do ChatroKe Model Biswa Padarshani Mein Pradarshit,' *Ranchi Express*, 21.03.1986
17. Bijnan Kitab Nehi, Hamara Jiban Hain, *Ranchi Express*, 16.01.2023
18. 'Bijnanke Prasar Mein Aham Bhumika Nibha Rahahain Rohini Sciecn Club', *Ranchi Express*, 30.04.1989
19. 'Rohini Bijnan Kendra Dwara Bijnan Prashikhan Shibir Ayojit,' *PrabhatKhabar*, 11.06.2023
20. The Department of Science and Technology, Government of Bihar, provided financial and administrative support for establishing the Bihar Council on Science and Technology in Patna in 1984. The goal was to use the advancement of science and technology to meet the technical needs of the average person. In addition, it develops the necessary infrastructure for technologists, educators, and scientists to conduct their research. Also, promoting science and technology in the state by helping young scientists develop a scientific attitude from an early age.
21. 'Paryabekhan Shikkha Par Prashikhan Shibir Sampanna', *Prabhat Khabar*, 03.01.1990
22. *PrabhatKhabar*, 12.04.1990
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34. *Rainwater Harvesting 3D Model Making Report*, 2008
35. *Annual Report on World Environment Day Cycle Campaign to promote rooftop rainwater harvesting*, (Ranchi: Rohini Science Club, 2010-11), p. 1
36. *Ibid*, pp. 2-3
37. *Report on Science Experiment Demonstration at MahilaSamakhya*, (Ranchi: Rohini Science Club, 2010)
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39. Objective of the workshop, *Robotix Technology Robotix Society*, (Ranchi: Rohini Science Club, 2012), p. 4
40. *Ibid*, p. 7
41. *Ibid*, pp. 8-9
42. UNICEF Bihar collaborates with numerous organizations throughout the state to promote and protect children's rights, especially from the most marginalized communities. They work across Bihar using a life cycle approach, focusing on the holistic development of a child from birth to puberty. Health, nutrition, water, sanitation, and hygiene (WASH), education, child protection, and social policy are among the services.  
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46. *A Report on Bringing Change in the Learning Atmosphere of Schools Empowering BalSansad and MeenaManch Members of Select Schools of Purnea and Gaya District (Bihar)*, (Ranchi: Rohini Science Club, 2019)