

Jawaharlal Nehru's Attitude towards Science and Technology

Roshani Rai

Abstract : *Jawaharlal Nehru, who is counted amongst the greatest and the most outstanding world figures of the twentieth century, was the principal architect of modern India. The second President of India and the great philosopher-statesman, Dr. Sarvapalli Radha Krishnan also once stated about Jawaharlal Nehru: "No homage is necessary for him. Modern India is the greatest monument which he has built for himself." Since scientific spirit formed the basis of Nehru's attitude towards life, he stated: "It is now patent that without science and technology we cannot progress," and that "modern life is an offspring of science and technology." Therefore, this paper seeks to study how Nehru's scientific spirit and his love of science and commitment to science played an influential role in guiding his policies in the fields of agricultural production, industrial development and advancement of science and technological developments after he became the first Prime Minister of independent India.*

Keywords: Jawaharlal Nehru, modern India, scientific spirit, science, science and technology, atomic energy, planning, agriculture, industry, technological development.

Introduction: Pandit Jawaharlal Nehru, an astute statesman, an ardent nationalist, a great visionary, a true democrat, a modern nation builder was one of the most outstanding and influential figures of the twentieth century and the first Prime Minister of independent India. As India's Prime Minister he emerged as a world leader and a great statesman.

After 1947 the responsibility of shaping the destiny of India fell upon the shoulders of Jawaharlal Nehru. Nehru, a great statesman and a visionary considered science as an essential and basic element of development and progress. While addressing the Indian Science Congress at Calcutta on 26th December, 1937 he said: "It was science alone that can solve the problems of hunger and poverty, of insanitation and illiteracy, of superstition and deadening customs and traditions, of vast resources running to waste, of a rich country inhabited by starving people" (Nehru 1948: 176). Therefore, Nehru saw science and technology as critically important instruments for solving economic and social problems (Morehouse 1987: 294). He was convinced of the fact that, it was the scientific method alone that offered hope to mankind and an ending of the agony of the world (Nehru 1948:179). Independence, in fact gave Nehru the opportunity to translate into action this formed conviction that science was crucial to the solution of India's socio-economic problems. Due to his incessant efforts, clear vision and an unyielding commitment, science and technology in India would not have been developed as a major force for bringing about social and economic change.

Scientific Spirit of Nehru: Scientific spirit formed the basis of Nehru's attitude towards life and he clearly articulated his views on scientific and technological development. He was convinced that the methods and approach of science have revolutionized human life more than anything else in the long course of history, and have opened doors and avenues of further and even radical change, leading up to the very portals of what has long been considered the unknown (Nehru 2004: 19). Nehru wrote:

"it is the scientific approach, the adventurous and yet critical temper of science, the search for truth and new knowledge, the refusal to accept anything without testing and trial, the capacity to change previous conclusions in the face of new evidence, the reliance on observed fact and not on pre-conceived theory, the hard discipline of the mind- all this is necessary, not merely for the application of science but for life itself and the solution of its many problems" (Nehru 2004: 570).

Nehru believed that science was a great force in the present age. One should imbibe the spirit of science and think on scientific lines. Underlining the importance of science, he further pointed out that "the scientific approach and temper are, or should be, a way of life, a process of thinking, a method of acting and associating with our fellow men" (Nehru 2004: 570). Therefore, for Nehru the scientific method was the only right method of approach to life's problems, and in India it was even more important than elsewhere because she was backward with science.

Nehru's scientific temper and approach clashed with that of organized religion which according to him produced narrowness and intolerance, credulity and superstitions,

emotionalism and irrationalism which tend to close and limit the mind of man, and to produce a temper of a dependent, unfree person (Nehru 2004: 571). Highlighting some of the negative aspects of religion, Nehru wrote in his *Discovery of India*:

“Religion, as I saw practised, and accepted even by thinking minds, whether it was Hinduism or Islam or Buddhism or Christianity, did not attract me. It seemed to be closely associated with superstitious practises and dogmatic beliefs, and behind it lay a method of approach to life's problems which was certainly not that of science. There was an element of magic about it, an uncritical credulousness, a reliance on the supernatural” (Nehru 2004: 13).

Nehru emphatically accepted that he “was still less interested in the supernatural or problems of a future life. Science and the problems of today and of our present life attracted me far more” (Nehru 2004: 10). Bhagat Singh, India's iconic revolutionary called Nehru a revolutionary who stood for a radical change and not mere reforms for his scientific and rational vision (cited in Habib 2016: 29-40).

Though Nehru had deep understanding of science and its application for mankind, he believed in the advancement of science combined with moral and ethical values and warned against the unrestrained use of science and technology. Emphasizing on the culture of technology, Nehru said:

“It has become inevitable for us to fit in with the modern world of science and technology and it will be dangerous for us to imagine that we can live apart from it. It will be equally dangerous for us to think that we should accept technology without those basic values which are of the essence of civilized man” (Jawaharlal Nehru's Speeches, Vol 4 1964: 170).

Nehru was afraid that if science gets divorced completely from the realm of morality and ethics, then it may be used for evil purposes. He therefore, wanted science to grow, develop and use for the good of humanity, and did not want the human values to technology lose its ground. He showed his keen interest in meeting scientists and discussing about innovation and development of science, and extended his fullest support for the development and advancement in the field of science and technology.

Modern Scientific and Technological Development: While Nehru possessed a real and considerable commitment to science and modern technology as major forces in the twentieth century world crucial to India's growth and future prosperity, he made enormous contribution in the development of science and technology which made India self-reliant. His spirited advocacy of the importance of science to India's future development is to be found in the annual parliamentary debates on motions to grant funds for different scientific purposes (Morehouse 1987: 291).

The Government's commitment to science and technology for the well-being of society was articulated in the Science Policy Resolution which was adopted by the Parliament on 4 March 1958 at the instance of Jawaharlal Nehru. The Resolution stated:

"The key to national prosperity, apart from the spirit of the people lies, in the modern age, in the effective combination of three factors, technology, raw materials and capital, of which the first is perhaps the most important, since the creation and adoption of new scientific techniques can, in fact, make up for a deficiency in natural resources, and reduce the demands on capital. But technology can only grow out of the study of science and its applications...." (cited in Menon & Sharma 1989: 364)

India already had a strong foundation of science at the time of independence as the works of some eminent scientists like C.V. Raman, J.C. Bose, S.N. Bose, Meghnad Saha, Ashutosh Mukherjee and many others had demonstrated. The spirit of newly-independent India was animated by a deep faith in scientific development (Menon & Sharma 1989: 363).

Nehru was primarily responsible for setting up a large chain of laboratories which covered the key areas of physical, chemical and biological science and technology. It was due to the enthusiastic support of Nehru and the dynamic leadership of S.S. Bhatnagar that these national laboratories came into rapid being under the Council of Scientific and Industrial Research. Nehru also established five Indian Institutes of Technology (IITs) on the model of Massachusetts Institute of Technology. The objective of founding these institutes was, in Nehru's words, "to provide scientists and technologists of the highest calibre, who would engage in research, design and development, to help..... towards self-reliance in technological needs" (Menon & Sharma 1989: 367).

Nehru laid the strong foundation of atomic research. For the development in the field of atomic energy, Nehru obtained the services of Homi Bhabha, who had already founded the Tata Institute of Fundamental Research (TIFR) in 1945. As a head of the country's Atomic Energy Programme, he formulated a self-propelled and self-reliant atomic energy programme for India. The Atomic Energy Commission was established on 10 August, 1948, in the Department of Scientific Research under the direct charge of Nehru 'to institutionalize and expand scientific research activities in atomic physics'. In 1954, separate Department of Atomic Energy was created which was directly under the Prime Minister and Homi Bhabha as Secretary

Both Nehru and Bhabha had a strong belief in the power of science and technology as a tool of economic and social change. Considering his scientific temper, Nehru wanted to direct science for developmental purposes. But the nuclear energy was a twofold technology which could be used for both constructive and destructive

purposes. Expressing his views on the atom bomb he said: "The use of the atom bomb, if properly made, will lead to world peace, otherwise the world will be ruined" (Gopal 1982: 228). He knew that the India would develop her scientific researches and hoped that Indian scientists would use the atomic force for constructive purposes. But again, Nehru was firm enough to say that if India was threatened, she would inevitably try to defend herself by all means at her disposal. But he hoped India, in common with other countries would prevent the use of atomic bombs. (cited in Ghose 2009: 431-440).

A careful study of Nehru's speeches and policy declarations clearly suggest that he did not exclude the nuclear option forever. Credit goes to Nehru for having laid the strong foundations of atomic research so that when the country decided to exercise the nuclear option it could do so without much hardship and hindrance. In 1954, Nehru inaugurated the Atomic Energy Establishment at Trombay. There, he named country's first swimming pool type reactor as Apsara. This was constructed with the help of Canada and the continuous co-operation of the United Kingdom, the United States and France. The Zerkina the first indigenous reactor, designed, engineered and constructed by Indian engineers reached criticality in January 1961. In 1962 the Atomic Energy Act was further amended which gave the Atomic Energy Commission and Department of Atomic Energy the full responsibility for planning, research, design and development, including the erection of atomic reactors and power generation for peaceful purposes (Singh 1989: 38). This laid a strong foundation for the development of atomic energy programmes in India. Expressing hope in the atomic energy he said: "The world is bound to change within the coming few years and I hope that atomic energy will be used in constructive power to uplift mankind" (Singh 1989: 231).

Another scientific field in which Nehru made a substantial contribution is defence research. He was influenced in this area by Lord Blackett, a leading figure in Britain involved in the application of scientific methods to operational problems of war during the second world war. Thus, Nehru decided to set up a scientific structure to advise on defence matters. D.S. Kothari was the first scientist to head this structure. The Defence Research and Development Organization was started in 1959 by joining together various technical branches under the Ministry of Defence. Although the real growth of this organization to its present size took place between the mid- 1960s and mid-1980s, but the basic structure for development of this area had already been designed by Nehru (Menon & Sharma 1989: 364).

Space research was another important area in which a strong base was laid by Nehru. Space research was placed under the jurisdiction of the Department of Atomic Energy in 1961. The Director of Department of Atomic Energy Homi Bhabha, then established the Indian National Committee for Space Research (INCOSPAR) with Dr. Vikram

Sarabhai as Chairman in 1962 and established a Rocket Launching Facility at Thumba. A year later, the first rocket was launched.

Nehru also underlined the importance of trained scientific manpower for the rapid development of science and technology in India. According to Homi Bhabha who estimated that, "about 1 percent or less of our scientific manpower is being utilized at present, though even that is not being properly organized". Nehru considered the training of scientists and utilization of scientific talents as his first priority in all schemes of development. The Scientific Manpower Committee was established in April 1947 which became a precursor of the National Register for Scientific and Technical Personnel under the Council of Scientific and Industrial Research. A scientist's pool was formed later to attract Indian scientists who were abroad and to provide them short-term placement on their return to India (Singh 1989: 35). Nehru also put scientists fully in charge of science departments as he was of the opinion that the scientists had a primary role in it and administrators a secondary played a secondary role. He wanted the scientists to come out of the government way of looking at things and to make them work outside the government scheme of things (Morehouse 1987: 293).

During the stewardship of Nehru, the expenditure on scientific research rose from Rs 24 million in 1947 to Rs 550 million in 1964. It was largely because of the farsightedness and able leadership of Nehru that India is one of the leading countries of the world with one of the largest reservoir of trained scientific manpower in the world and occupies a position among those countries, which are highly advanced in the use of atom power for peaceful purposes.

Industrial Development and Agricultural Production: Nehru's great zeal for science and scientific approach to life was evident when he stated: "whenever the chance offers I say something about the importance of science and its off-shoot, technology. I think, we should realize that modern life is an offspring of science and technology" (cited in Bhabha 1978: 48). It was apparent to him that political freedom had to make social liberation secure and certain and that was achievable only through economic growth and this invariably demands the complete use of science and technology to achieve profitable results and make use of unused natural resources of the land. He wanted to transform the Indian economy to one based on modern science and technology.

Nehru brought science into planning as he was of the firm belief that science was an inextricable part of social, political and economic structure of the world. According to Nehru, if India was to progress, she must develop heavy engineering and machine-making industry, scientific research institutes, and electric power to develop India industrially and his vision was operationalized through the planning process which

also owes its existence to Nehru's vision. The Planning Commission was set up after independence in 1950 with Nehru as its first Chairman, and he continued to remain so, as Prime Minister of India, until his death in May 1964 (Menon & Sharma 1989: 365). Nehru ensured that science was made an integral unit of economic planning and this exercise began with the planning of science and technology. Professor P.C. Mahalanobis, the eminent statistician of India was closely associated with Nehru in the work of the Planning Commission and scientific matters generally, and in January, 1955, he became a de facto member of the Commission (Morehouse 1987: 290)

Though Nehru devoted utmost importance to heavy industries, he also understood the significance of small scale or cottage industries. According to Nehru, we have to develop the village and cottage industry in a big way, and while trying to develop both the industry, one should not forget the human factor. For, we are not merely out to get more money and more production, but we ultimately want better human beings (Jawaharlal Nehru's Speeches Vol 2 1963: 84). During Nehru's time, huge steel and iron, coal, oil refineries, and ship-building industries were set up which provided a strong industrial foundation to the country. Nehru was farsighted enough to foresee that the development of industries would have a powerful impact on the Indian economy which was essential for a modern nation, and the industries should be developed by the application of science and technology as he wrote in 1934: "I want to increase the wealth of India and the standards of living of the Indian people and it seems to me that this can only be done by the application of science to industry, resulting in large-scale industrialization" (Nehru 1934: 36). The mature industrial structure that we inherit today, is in no small part due to the foresight of Nehru who also bequeathed to us the scientific and technological capacity development today.

Though Nehru firmly believed that "rapid industrialization is essential to relieve the pressure on land to combat poverty and raise standards of living, for defence and variety of other purposes," yet it would be pertinent to look back what he said in both the Houses of the Parliament in 1952:

"We certainly attach importance to industry; but in the present context we attach far greater importance to agriculture. If our agricultural foundation is not strong then the industry we seek to build will not have strong basis either. Apart from that, the situation in the country today is such that, if our food front cracks up, everything else will crack up, too. Therefore, we dare not weaken our food front" (Jawaharlal Nehru's Speeches Vol 2 1963: 89).

Nehru laid the greatest stress on agriculture because it was only on the basis of agricultural prosperity that India could make industrial progress (Jawaharlal Nehru's Speeches Vol 2 1963: 94). Again, in a speech at a meeting of the National Development

Council held at New Delhi on November 8th 1963, Nehru said: "Agriculture is more important than anything else because agricultural production sets the tone to all economic progress" (Jawaharlal Nehru Selected Speeches Vol.5 1968: 110). Through planning he not only wanted to raise the living standards and bring prosperity to the people of India, but he also had the reason to make India one of the foremost countries of the world.

Homi J. Bhabha (1978) pointed out that modern agriculture with high levels of production attained for example in America, whereby less than 10 % of the population produces more than enough for the whole, is equally based on modern science and technology, for it depends on machinery for sowing and reaping, on the production of better strains by scientific breeding, and on abundant use of fertilizer, which itself is a product of the chemical industry. "After all," Nehru said, "how has agriculture grown in many other countries greatly? It is because of the application of science and technology. If modern life depends so much on science and technology, then we must seize hold of them, understand them and apply them" (cited in Bhabha 1978: 49). Adhering to this formula, the First Five Year Plan (1951-1956) accorded the highest priority to agriculture including irrigation and power and community development projects and about 44.6 % of the total outlay was allocated for their development. However, in the Second Five Year Plan (1956-61), attention was shifted from agriculture to industry and only about 21% of the actual plan expenditure was spent for agricultural development (Prabha et al 2015: 41-47). Thus, industry and mining obtained 183% of the total plan outlay and in addition transport and communication department got 28.9 % and irrigation and power 10% (Roy 1965: 104-105). It has been said that Nehru laid the foundations for the technological reforms in agriculture, the basis of the Green Revolution, which made India food surplus in a remarkably short period (Mukherjee & Mukherjee 2015: 77). Daniel Thorner, one of the fervent observers of Indian agriculture since independence observed:

"It is sometimes said that the (initial) Five Year Plans neglected agriculture. This change cannot be taken seriously. The facts are that in India's first twenty-one years of independence more has been done to foster change in agriculture and more change has actually taken place than in the preceding two hundred years" (cited in Mukherjee & Mukherjee 2015: 77-78).

By and large, Nehru perhaps felt that he had no option but to give higher priority to basic industries steel, coal, oil and machine building, in order to build the foundations of a modern, self-reliant Indian economy, without which even agricultural development was not possible beyond a point and which was indispensable not only for rapid economic development but also for safeguarding the country's independence

and society (Rajnayer 1975: 31). If today India is not much reliant on the advanced and developed countries not merely in the economic field, but that also in that of defence supplies, if India has become self-sufficient in food production, it is due to modernization of agriculture. This was possible due to the attention paid to the modernization of the economy during Nehru era.

Failures of Nehru's Science and Technology Policy: Though Jawaharlal Nehru made enormous contribution in the field of science and technology which made India strong and self-reliant, yet his policies in the allied fields were not free from criticism and failures were visible in few areas.

While Nehru was of the strong opinion that science alone could resolve the issues of hunger and poverty, insanitation and illiteracy, superstition and deadening customs and traditions, with vast resources running waste in a sick country inhabited by starving people, but astonishingly he never gave serious attention to the eradication of these ills which still afflict the country. He failed to take steps for the betterment of the poor (Radhakrishna 2009: 157-164).

Planning according to Nehru meant economic and social development. He ensured that science was made an integral part of economic planning and this process began with the planning of science and technology. Nonetheless, his model of development is not without criticism. It has been said that he spoke mainly of science but hardly about technology and more emphasis was attached to heavy industry which was not labour intensive. Though he talked about developing village and cottage industry, he did not give much attention to its growth and development. It is also believed that the indigenous technology did not develop sufficiently due to his blind following of west and western technology (Singh 2002: 251).

Though Nehru was convinced of the importance of science, inevitably science came to be Government-controlled, his personal interest and his association with a handful of Indian scientific leaders impeded the development of any effective instruments for fashioning in some coherent and continuing manner government policy towards science and the scientific community (Morehouse 1987: 303). By giving importance and pre-eminence to the scientists and the scientific establishments like national laboratories, the position of universities was downgraded and stripped of trained talent and the scientists acquired elitist traits who failed to understand and try to solve the manifold problems facing the country. The lack of proper communication and linkage between laboratories, universities and the user industry has also been regarded as a lacuna in the field of scientific research during Nehru's times and that the full benefits did not reach the society (cited in Singh 2002: 251).

Conclusion: Nevertheless, the failures should not underrate Nehru's contributions and achievements in the field of science and technology which had far-reaching impact in the building of the Indian nation. Jawaharlal Nehru, a true man of India's destiny and builder of our great nation and creator of modern India was a universally respected world statesman. He understood and recognized the importance of science in transforming an economy of scarcity into one of profusion, and from traditionalism to modernism, the path which the whole world is now following. He had full appreciation of the scientific revolution which transformed the world. Nehru believed that the creation of a vast and firm scientific managerial and technical foundation was essential to India's progress and prosperity at all levels, and under his Premiership Indian Institutes of Technology were established to provide highly competent and qualified scientists and technologists who would help in building a self-reliant and technological India. He wanted to use science and technology not only for economic progress, but even more as an instrument to free the Indian mind from the shackles of prejudice and superstition, and for this reason he emphasized the need of developing scientific temper (Kaul 1992: 174). He firmly believed that scientific method and approach alone can revolutionize human life. Nehru realized that the economic development based on a strong industrial base and attainment of self-sufficiency in the field of agriculture and food production was possible only through the fullest application of science and technology. Though Nehru was against nuclear weapons, but he formulated an aggressive science and nuclear policy as he was of the firm conviction that nuclear technology had a part to play in national development and also reduce dependence on foreign personnel, material and machinery. These ceaseless efforts made by Nehru carved a place of prominence not only for himself, but also for India and her people as a whole. The progress in the field of science and technology which has been possible today is altogether due to the vision, farsightedness and tireless efforts of the first Prime Minister of India.

References

- Bhabha, H. J. 1978. Jawaharlal Nehru and Science. In B. K Ahluwalia (ed.), *Jawaharlal Nehru: India's Man of Destiny*. pp. 48-54. New Delhi: Krishna Gopal and Newman Group of Publishers.
- Ghose, A. Oct-Dec, 2009. Non-proliferation and Nuclear Disarmament: Evolving Policy Challenges. *Indian Quarterly*, Vol. 64, No.4. Downloaded from <https://www.jstor.org/stable/pdf/45072931.pdf> on 15th August, 2020.
- Gopal, S. (ed.). 1982. *Selected Works of Jawaharlal Nehru*, Vol. 14. New Delhi: Orient Longman.
- Habib, S. I. March- April, 2016. Legacy of the Freedom Struggle: Nehru's Scientific and Cultural Vision. *Social Scientist*, Vol. 44, No. 3/ 4. Downloaded from <http://www.jstor.com/stable/24890242>. on 31st July, 2020.
- Jawaharlal Nehru's Speeches*, Vol. 2. 1963 Third Impression. Delhi: Publications Division.

- Jawaharlal Nehru's Speeches*, Vol. 3. 1958. Delhi: Publications Division.
- Jawaharlal Nehru's Speeches*, Vol. 4. 1964. Delhi: Publications Division.
- Jawaharlal Nehru Selected Speeches*, Vol. 5. 1996 Third Edition. New Delhi: Publications Division.
- Kaul, T. N. 1992. Nehru the Idealist and Revolutionary. In: J. Grigg (ed.), *Nehru Memorial Lectures 1966-1991*. pp. 153-176. New Delhi: Oxford University Press.
- Maale, D.L. 2015. *Contributions of Pandit Jawaharlal Nehru to Indian Politics: A Critical Study*. Solapur: Laxmi Books Publications.
- Menon, M.G.K. and Manju Sharma. 1989. Nehru and Science. In S. Dikshit & et. al. (eds.), *Jawaharlal Nehru: Centenary Volume*. pp. 361-368. New Delhi: Oxford University Press.
- Morehouse, W. 1987. Nehru and Science: The Vision of New India. In V.T. Patil. (ed.), *Studies on Nehru*, pp. 286-309. New Delhi: Sterling Publishers Private Limited.
- Mukherjee, A. and M. Mukherjee. 2015. The Indian Economy in the Nehru Era. In N. Sahgal (ed.), *Nehru's India: Essays on the Maker of a Nation*. pp. 65-87. New Delhi: Speaking Tiger Publishing Pvt. Ltd.
- Nehru, J. 1934. *Recent Essays and Writings*. Allahabad: Kitabistan.
- Nehru, J. 1948 Third Impression. *The Unity of India*. London: Lindsay Drummond.
- Nehru, J. 2004. *The Discovery of India*. New Delhi: Penguin Group.
- Prabha, B.K. & et.al. June, 2015. Indian Agriculture and Rural Development Under Five Year Plans: An Appraisal. *Agriways Journal*, Vol. 3. No.5. Downloaded from <http://www.agriwaysjournal.com/wp-content/uploads/journals/volume3.1/10.pdf>. on 20th July, 2020
- Radhakrishna, B.P. Feb, 2009. Nehru's 'Discovery of India' The Role of Science in India's Development. *Journal of the Geological Society of India*, Vol. 73. doi: <https://doi.org/10.1007/s12594-009-0072-2>.
- Rajnayer, B. 1975. *The Modernization Imperative and Indian Planning*. Delhi: Vikas Publications.
- Roy, A. 1965. *Planning in India: Achievements and Problems*. Calcutta: National Publishers.
- Singh, B. 1989. Nehru and Indian Science Since Independence. In S. Dikshit & et. al. (eds.), *Jawaharlal Nehru: Centenary Volume*. pp. 33-42. New Delhi: Oxford University Press.
- Singh, S. 2002. Nehru: Science and Technology. In D.S. Chaudhary (ed.), *Nehru and Nation Building*. Jaipur: Aalekh Publishers.

Bio Profile of the Author:

Assistant Professor, Department of History
Tripura University, Suryamaninagar, Tripura
Email: rai_rosh@yahoo.co.in