

# SCIENCE, TECHNOLOGY AND SOCIAL PROCESSES IN INDIA: SOCIOLOGICAL DISCOURSES

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## Introducing the special issue

A sociological understanding of the rise and growth of modern science and technology in India could be attempted through the articulation of the phenomenon through a structural and a process approach. The structural approach and the process approach are not dichotomous, rather are complementary to each other. If the structural features determine the social processes, in return the social processes influence the structural features of the society in the long run.

Modern Science and Technology in India is enshrined in the state. It is not merely funded by the state, it also is administered by the state. It has got its legitimacy from the state and it also in return offers legitimacy to the modern Indian nation state, as the dominant form of knowledge system. Therefore, today it is state science and technology and hence it rules as part of the system of state political domination and state control over other forms of scientific and technical knowledge systems that are tradition based and community based (socio-culturally embedded).

The structural aspects of Indian science and technology could be perceived in the form of rise of university based science and technology (rooted in pre-independent India) and national institutes and national laboratory based science and technology in India (post-independent). This is of course inclusive of the rise of industrial R&D centers in Indian Industries through Government policies and programmes. This structural perception of Indian science and technology is marked by the institutional inequalities existent in terms of infrastructure and research productivity in the Centres/institutes of national importance and some centrally funded elite universities vis-à-vis poorly funded and staffed state universities and institutes of research. It not only brings into fore front the issue of unevenly existent infrastructure but also the uneven quality of research manpower existent in these institutions.

This subsequently hints at their widely uneven rate of productivity and quality of research and developmental works.

The other structural perception of Indian science and technology refer to the heavily funded research in science and technology in the areas of nuclear research, defence research and space research; but these have stayed beyond the purview of socio-economic/policy studies. Hence keeping aside these, the structural perception of science and technology in India refers to the gross unevenness at the institutional level of research; where state supports on priority basis research in areas like civil-nuclear, electronic and telecommunications (particularly ICT), bio-technology and drugs & pharmaceuticals etc vis-a-vis research in other areas. That apart, perception of structural form science and technology at institutional level, particularly in industrial R&D, refers to the highly unequal level of productivity and quality R&D carried out by the public sector industry vis-a-vis the private sector industry. Further this perception can be extended to similar differences in R&D performances existent between large firms vs. small firms.

The alternate perception of structural forms of science and technology in India is to cut across institutions and articulate the structure through various professional and formal net-works of researchers, viz: professional societies/bodies where researchers with particular areas of specialization and believers of particular theories and methodologies converge to share their works/ideas. These professional net-works often publish their newsletters and at times their journals. Often such societies are even based on the nature of their areas of research, i. e. fundamental/applied or theoretical/experimental.

On the contrary the process approach mostly rests on critical perspectives, as it tries to articulate the rise and growth of science and technology in India through social and political processes of criticism or even through radicalism. It may even otherwise take a reformist view. These processes are abstract by nature, refer to social and political responses to the rise and growth of modern science and technology over long durations. These processes refer to the People's science movements in India, the Appropriate technology movement in India, Science popularization movements in India etc that have evolved and culminated over decades. Otherwise also the systematic application of science and technology to Indian society has long term consequences of sociological nature, viz, being instrumental to social stratification (class formation). These too could be perceived as social processes, may not be independent, but being very effective as part of larger socio-economic processes of change. Emergence of these social processes has its roots in the historical responses of Indian society to the growth of modern science and technology that has been state driven. These processes are emergent of the hiatus between dominant form of science and technology sponsored by the central political ideology of the Indian state and the traditional, cultural and popular scientific and technological practices/knowledge forms of Indian Society that reflect diversity. However these are ongoing social processes that are continuously in interaction with the structural aspects of the science and technology. These processes too contribute toward the dynamic nature of social structure. This process may push for policy actions that have structural relevance. On the contrary the structural disparities may also contribute toward the emergence of such critical processes. Here in this issue, on account of spatial constraints, I would be dealing with only the process related issues discussed above and the structural issues of Indian science and technology in a subsequent issue.