

Bringing science into society for public welfare: role of scientific social responsibility

Gunasekaran Umasakthy, Ranjit Unnikrishnan, Ranjit Mohan Anjana and Viswanathan Mohan

Science, technology, and innovation have advanced significantly in India. However, the dissemination of scientific knowledge to the general public is woefully inadequate. The Government of India has recognized the need for science and technology to integrate more with society. It has therefore formulated the concept of social scientific responsibility (SSR) and has recently issued guidelines for the same¹. SSR covers the convergence of scientific knowledge, visionary leadership and social conscience. It is about developing connections between science and society as well as creating synergies among all stakeholders in our scientific community. India's scientific progress since independence is worthy of praise; however, the issue of scientific knowledge transfer and its benefits to society as a whole persists. As a result, strengthening the connection between science and society is just as important as spending more money on human and social development. A policy on SSR could institutionalize the application of scientific knowledge to achieve social objectives. Usually, taxpayers' money is used by Government organizations to support scientific work. Hence it is the duty of scientists to give back to the society by taking up SSR activities². Figure 1 shows the mission of SSR which covers the convergence of scientific knowledge, visionary leadership and social conscience.

SSR is not only about how science affects society but also how society affects science¹. The relationship between science and society is a two-way engagement, as shown below.

Science affects society ⇌ Society affects science.

SSR would boost the ecosystem of knowledge and make it easier to use science for the good of society. Additionally, it would alter the mindset and working style of the scientific community, thereby improving the social reputation of our scientific organizations. SSR thus has the potential to fundamentally alter society by enhancing the lives of our citizens and assisting the nation in achieving its sustainable development objectives.

The principles of SSR include the following³:

- Increasing knowledge/awareness among the public about recent scientific developments.
- Passing on the benefits of science to meet public needs.
- Creating an environment for idea-sharing.
- Collaborating with the public to identify their needs and provide suitable solutions.

The goal is to integrate science and technology with society at all levels⁴.

Examples of SSR initiatives that stakeholders in various categories could participate in are given below:

- Scientists can give lectures in schools and colleges as modular or full courses or on a particular topic to encourage students to study science and pursue a career in this field.
- Training and participation: Mentoring school students in their innovation projects, establishing and maintaining interactive exhibits in schools or for the public (museums, libraries), developing skills through training and workshops, and sharing infrastructure (instruments, equipment, databases and software) that is not proprietary to the research facility; digital platforms that are not proprietary.
- Students can be permitted to do internships or short projects in scientific laboratories, research centres, etc. to kindle their interest in science.

- Solution and technology demonstrations: A scientific or technical solution to a local problem (such as environmental, ecological, health or other similar issues).
- Working with innovators: Assistance with technology for rural and local innovators; solving a specific problem.
- Distributing scientific and technological information via social media through articles and interviews both in English as well as in the local language.
- Research facilities and training in high-end scientific techniques.
- Writing popular science articles or stories for newspapers, magazines, and other print and electronic media, including social media, about important research problems or findings. Competitions within research institutions or industries may be held to promote this activity.
- Giving scientific talks about popular topics (through television, radio, newspapers, magazines, social media, etc.) to eliminate wrong notions among society and counter fake news and pseudo-science.
- Assisting non-governmental organizations (NGOs) in applying science and technology to societal problems.
- Science and technology-based empowerment of women and other marginalized members through education, training, and the application of science



Figure 1. The mission of SSR.

and technology by appropriate NGOs to generate income.

Based on their stated social needs and overall SSR goals, knowledge institutions and employees must develop action plans to implement various SSR schemes¹.

SSR can carry logical and imaginative answers for cultural issues, particularly concerning marginalized segments of society, to aid in their upliftment.

The benefits of SSR are as follows⁵.

- Increasing the scope of science and its benefits to the community by encouraging students to pursue science by mentoring and handholding them.
- Providing an opportunity for researchers at universities and colleges to collaborate and share science and technology laboratory resources.
- Providing instructions for improving scientific knowledge and skill acquisition.

- Encouraging scientists to participate in innovation for rural implementation.
- Using the scientific intervention to empower women, the disadvantaged and weaker sections of society.
- Identifying SSR success models and best practices for nationwide replication, which can have a multiplier effect.

Science is an invaluable part of our society that helps improve the quality of life for individuals and communities. With SSR, scientists can make a positive impact on their local communities by utilizing their knowledge and research to benefit all members of society⁵. By implementing sustainable practices and using science as a fulcrum, we can ensure that all members of society receive equal access to resources and opportunities while simultaneously paving the way for a brighter future. The time to act is now.

1. Guidelines on scientific social responsibility from SERB – 2017–2019; https://serb.gov.in/assets/pdf/disclosure/SERB_SSR_Policy-documentVersion2_1.pdf (accessed on 1 December 2022).

2. Scientific social responsibility guidelines, 2022; <https://www.adda247.com/upsc-exam/scientific-social-responsibility-guidelines-2022/> (accessed on 1 December 2022).
3. Science and social responsibility: getting Started, 2022; <https://library.madonna.edu/socialresponsibility> (accessed on 1 December 2022).
4. Rull, V., *EMBO Rep.*, 2014, **15**, 919–922.
5. Scientific social responsibility – SSR, October 2022; <https://www.clearias.com/scientific-social-responsibility/> (accessed on 1 December 2022).

Gunasekaran Umasakthy, Ranjit Unnikrishnan, Ranjit Mohan Anjana and Viswanathan Mohan are in Dr Mohan's Diabetes Specialities Centre, Chennai 600 086, India; Ranjit Unnikrishnan, Ranjit Mohan Anjana and Viswanathan Mohan are also in the Madras Diabetes Research Foundation, Chennai 600 086, India.*

**e-mail: drmhans@diabetes.ind.in*

COMMENTARY

Return of the giants: are the traditional elephant corridors being revived?

Kanchan Puri and Ritesh Joshi

In the recent past, some cases of unpredictable movement of elephants have been reported from different parts of India, wherein the species was found moving beyond its natural ranges. Whether such abrupt movement by the elephants indicates the revival of their historic corridors or a shift in their natural ranges remains uncertain. However, some identified populations have been observed to move long distances as part of their traditional seasonal migration. Some cases of unusual sightings and dispersal of elephants beyond their ranges and in new landscapes indicate the revival of corridors and consequent capabilities of the animal to respond to the changing environment. Long-term studies are needed to verify how developmental and anthropogenic activities alter environmental niches. Moreover, in order to understand and address the issues related to the restoration of viable ecological corridors, revisiting and restructuring the conservation priorities and strategies would be paramount. This would enable the species to move long distances through the landscapes and ensure long-term survival.

Large-range movements among wild animals help them acclimatize to the immediate environmental changes and develop the ability to maintain population continuity for gene flow. They also influence plant community dynamics through seed dispersal and thus shape biodiversity. Species' movement across large distances and successful survival are essential to their evolutionary success. Animal movement is a core component of an ecosystem, and maintaining movement patterns may be vital for sustain-

ing ecosystem processes like trophic and species interactions^{1,2}. Though the movement of species across new grounds results in competitions for space and resources, and sometimes human–animal conflict, it provides the scope of addressing the edge effects and habitat fragmentation. As often there is a lack of knowledge of where, when and why species move, the field of movement ecology has grown rapidly in the last decade and is now providing the knowledge needed to incorporate move-

ments of species into management planning³.

Once present in almost all the forest tracts of the Indian subcontinent, elephants are now restricted to disjointed habitats across 13 range countries across South and Southeast Asia. In India, the northern population of elephants ranges across the western Himalayan foothills in Uttarakhand and Uttar Pradesh (through Nepal). However, the northeastern population ranges across Sikkim, north Bengal, Assam and