

Need for a socially consistent science and technology policy

Narendar Pani¹ has tried to evaluate the development of science and technology (S&T) in India under the aegis of the Scientific Policy Resolution (SPR) of 1958. The preamble of the Resolution dwells on the values and significance of scientific progress. Its aims were 'to promote, foster, cultivate and sustain science and scientific research' in all its aspects and 'to secure for the people of the country all the benefits that can accrue from the acquisition and application of scientific knowledge'. The drafting of this resolution is attributed mainly to Homi Jehangir Bhaba and Jawaharlal Nehru². Pani¹ has identified the pitfalls of SPR as follows: 'The drive to making the Indian economy globally competitive, particularly after 1991, has however been driven primarily by a search for capital. The reform process has focused on enabling foreign capital to enter previously debarred areas, the mechanisms for the entry of portfolio investment have been transformed to make them more globally attractive, capital markets have been streamlined to enable large Indian companies to raise capital more efficiently, and efforts have been made to generate and use state resources to pro-

vide capital for large infrastructure projects. In this entire process the technological challenge has been largely under-emphasized.'

The three objectives of SPR were defined³: (i) to ensure 'an adequate supply, within the country, of research scientists of the highest quality'; (ii) to encourage 'with all possible speed, the training of scientific and technical personnel', and (iii) 'to secure for the people of the country all the benefits that can accrue from the acquisition and application of scientific knowledge'. The basic needs of the masses like education, health, housing, transport and communication have hardly been touched. While S&T is marching ahead in sophisticated areas, poverty of the masses, problems of illiteracy and unemployment are dragging the country backward. Considering this scenario, one of India's top scientists remarked⁴: 'The best in the country is often about as good as anywhere else in the world, but the worst is poor; tall peaks tower over a low average'.

Pani¹ proposes an alternative model of SPR for Indian economy looking outside the mainstream neo-classical paradigm by referring to the Joseph Schumpeterian

model⁵. He suggests three departures from the previous SPR to make it more effective. I agree with his conclusion: 'While the specifics of a new Science and Technology Policy are open to debate, as it indeed should be, it is quite evident that the underlying logic of earlier S&T policies is becoming increasingly inconsistent with the demands of the emerging Indian economy and society.'

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3. Government of India's Scientific Policy Resolution, New Delhi 1958, 1964, p. 2.
4. Narasimha, R., *Technol. Soc.*, 2008, **30**, 330–338.
5. Schumpeter, J. A., *Capitalism, Socialism and Democracy*, Harper, New York, 1943.

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NEWS

Sikkim claims India's first mixed-criteria UNESCO World Heritage Site

During its 40th session, the World Heritage Committee of the United Nations Educational, Scientific and Cultural Organization (UNESCO) sanctioned the Khangchendzonga National Park (KNP) as India's 35th World Heritage Site. This inscription comes after a decade of planning that began in March 2006, and protects nearly 178,500 ha of Himalayan habitat in Sikkim. KNP joins India's rapidly expanding network of 27 cultural and 7 natural heritage sites; however, it is the first and only Indian site to meet the mixed—both cultural and natural—heritage criteria.

KNP was inscribed as Sikkim's first State Park in August 1977, two years after the former Buddhist kingdom's integration into the Indian Union. Two decades later, the Government of Sikkim under Chief Minister Pawan Chamling expanded upon these provisions, and extended the park borders to protect high-altitude ecosystems adjoining the Kanchenjunga Conservation Area (Nepal) and the Qomolangma National Nature Preserve (Tibetan Autonomous Region of China). In 2000, KNP joined the United Nations Biosphere Programme, and currently protects over 35% of

Sikkim's total area through adaptive management programmes¹.

But, this latest milestone did not come easily. At first, non-government organizations presented an unpersuasive proposal for KNP's inscription. Drafting partners at The Nature Conservation Foundation and Ashoka Trust for Research in Ecology and the Environment solely emphasized the natural features of the Park under World Heritage Criteria VII (reference no. 2106; 15 March 2006). Criteria VII provisions 'sites that contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic

importance². In August 2016, Chief Minister Chamling recalled ecotourism as a major driver of this strategy. He was pleased that, 'with the UNESCO recognition, this unique national park is bound to receive more and more tourists – both domestic and foreign – in the coming days.'

V. B. Mathur, Director of the Dehradun-based Wildlife Institute of India and a member of the Indian UNESCO delegation, believed that although unsuccessful this initial proposal set the necessary framework for subsequent applications. In an interview to the *Times of India*³, he touted that the KNP exhibits one of the steepest elevational gradients of any protected area worldwide, spanning seven kilometers in elevation (1220–8586 m). He detailed that the park provides habitat for keystone species like the Red Panda (*Ailurus fulgens*) and Snow Leopard (*Panthera uncia*), and houses sacred landscape features that attract over 35,000 tourists annually.

However, Criteria VII accounts for neither biodiversity conservation nor cultural preservation.

A 2002 assessment by the International Union for Conservation of Nature (IUCN), an advisory unit for UNESCO, flagged KNP as one of 28 global mountain areas with strong potential for heritage recognition. Later, the United Nations Environment Program (UNEP) ranked KNP in the top 0.7–1.2% of all protected areas worldwide for the irreplaceability of its species, that is, 1246th most irreplaceable protected area, 2135th with respect to threatened species⁴. Biodiversity conservation aligned well with UNESCO's other ten-point criteria for selection in Sikkim.

These biological features took centre stage in subsequent applications. World Heritage Criteria X became the pillar for conserving KNP as a site that contains 'the most important and significant natural habitats for *in situ* conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation'².

Nonetheless, the data underpinning this application were considered unsatisfactory. Specifically, the biological

data buttressing the Indian delegation's claims were deemed questionable by the 21-person UNESCO Advisory Committee, which drew upon international experts at the IUCN and the International Council on Monuments and Sites (ICOMOS).

Communications between UNESCO advisory personnel and the Government of Sikkim dated September through December 2015, and ending on 30 January 2016, questioned the Indian delegation's claim on species richness in KNP. The Ministry of Environment and Forests, Government of India (GoI) responded by providing more accurate statistics on higher vertebrate richness. For example, the number of reported bird species dropped from 300 in the initial proposal to 213 species, and the number of mammals dropped from 124 to 45 species.

After sustained challenges, national-level authorities at the Ministry of Culture, Ministry of Human Resource Development, and Ministry of Environment, Forests, and Climate Change, applied for KNP as a mixed biological and cultural landscape. Research institutes, like the Namgyal Institute of Tibetology, were essential for promoting KNP as the nexus of two distinct sacred landscape narratives for indigenous and local peoples in Sikkim. These landscapes are known as *Beyul Demojong* among Tibetan-origin groups and *Mayel Lyang* among the indigenous Lepchas.

During her concluding remarks on 16 July 2016, Ruchira Kamboj of India's Permanent Delegation to UNESCO affirmed the importance of KNP's cultural heritage in the ultimate proposal. She explained how sacred natural features in KNP are already protected by the Government of Sikkim under Articles n.59/Home/98 and n.70/Home/2001. Other national provisions, including the Wildlife Protection Act (1972), the Forest Conservation Act (1980), and India's Places of Worship Act, ensure landscape conservation for generations to come. Khamboj encouraged future partnerships between forestry officials and scholars at the Ecclesiastical Department of Sikkim and the Department of Cultural Heritage Affairs, to sustain biocultural conservation initiatives.

KNP was officially inscribed under four of UNESCO's World Heritage Criteria during the UNESCO convention in Istanbul, Turkey. These Criteria recognize the Park's critical habitat (Criteria X), iconic natural features (Criteria VII), and inextricable link to Sikkimese identity, culture and worldview (Criteria III and VI; reference no. 1513). Other Himalayan landscapes, including Nepal's Mustang Region and Bhutan's Jigme Dorje National Park are under consideration based on this precedent.

Because of its dynamism, the KNP Heritage Site may promote transboundary relationships among Nepal, India and Bhutan. The IUCN encouraged progressive additions of what are already well-protected and valuable forests in Nepal's Kanchenjunga Conservation Area and lower-altitude buffer forests surrounding KNP. Recent trade revisions with China at Natula may complicate the potential for Indo-Chinese cooperation. It is yet to be seen how the Government of Sikkim will respond and conform to the standards outlined by the UNESCO World Heritage Committee.

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