18th All India Peoples Science Congress
Kolkata: 27-30 December 2024
Theme Paper

Science & Technology (S&T) will be crucial for the development trajectory of India in the coming decade or more in what is termed the knowledge ere when the possession of knowledge rather than just manufacturing or trade will determine economic growth and a country's position in the world. India aspires to become 'Atmanirbhar Bharat' as a means to attain economic growth and societal progress in this period, or even to become a developed nation by 2047. However, India faces significant headwinds in these and related fronts.

It is well known that investment in research and development (R&D) in India, at 0.64% of GDP (down from 0.76% a decade earlier), is extremely low in comparison with comparable countries, for example China with 2.4% of a GDP which itself is about 5 times larger than India's, or South Korea with 4.8% of GDP. Other countries like China have prioritized mastery over key technologies such as AI, advanced semi-conductors, 5G, solar energy, batteries and storage systems, so as to attain or maintain a leading position in the global economy. On the other hand, India is struggling in all these areas.

Currently, India is on an import-dependent path of seeking foreign investment to set up manufacturing industries in India in some of these sectors, but at lower rungs in the value-chain, unlikely to lead to significant generation of indigenous knowledge or self-reliance. In the pursuit of increased R&D funding, a new centralized mechanism, the Anusandhan national research Foundation, has been set up reposing faith in investment by the private sector, which has historically been reluctant to spend on R&D even in its own industries, leaving India's R&D plans mired in uncertainty. India needs to look for another path towards strategic and sharp increases in R&D as well as to reform and strengthen institutional structures in the research ecosystem including universities.

Other than in advanced technologies, the country is facing mounting and growing unemployment especially among youth and women. ILO's recent report has highlighted that 80% of the unemployed workforce in India consists of youth. Even more important, unemployment among youth with secondary education has almost doubled since 2010 to about 65%. The figure is even higher among graduates, with five times more women not in employment, training or higher education than men. Increasingly, whatever employment is available is in the unorganized sector without social benefits, threatening the so-called demographic dividend. A few years ago, 32% of the workforce was over 45 years old, today it is 49%, and by 2040 over 91% of Indian society will have no access to pensions or other social benefits. It is no wonder that poverty has risen sharply as has frustration and social problems among the youth.

Self-reliance in S&T has been a core theme of the AIPSN, which has conducted numerous studies and campaigns on different aspects. In the current juncture, S&T self-reliance occupies a key place in determining how the country and its people progress and how they will face the future. It is therefore a central Theme for the 18th AIPSC.

Comparable middle-income countries have also invested significantly in education including skill development, and in health, both at an order of magnitude higher than India as a proportion of GDP, with much of the investment and institutions in the State sector. Here again, and especially of late, India seems headed in a questionable direction. In the name of rationalizing infrastructure, a sizeable proportion of public schools are being closed or merged, with inevitable adverse effects on enrolment and drop-out rates, particularly in rural, remote and backward areas, and has serious negative impact on girls, socio-economically disadvantaged sections and the disabled. Educational competencies have been found wanting at all levels. With the erstwhile Literacy drive, especially through popular mobilization and community involvement, having been abandoned, even basic literacy and numeracy may be negatively impacted. These losses are very unlikely to be compensated for by online education or distance learning. Centralization of university entrance examinations, along with cultural homogenization in Central Board text books, undermines State autonomy and school Boards, and negates context-specific curricula and teaching-learning as recommended by educationists. All these also superimpose a homogenization of culture over the multi-cultural reality that is India.

Higher education is being radically transformed under the new Education Policy with novel 4-year undergraduate courses comprising annual exit and entry points, with corresponding annual certifications whose value in the employment, vocational or academic ecosystems remain wholly unknown. The ability of inadequate and understaffed higher education institutions to handle all these systematic changes, including transferable credits from learning in other institutions or for work experience, is doubted by faculty and educationists. Fees for such courses have also risen dramatically and full rein has been given to privatization and commercialization of higher education. Experts have pointed to the need for more PhDs and greater push for research in higher education institutions in India as essential for advancement in the knowledge era. Given the seeming obsession with centralized examinations in the new education policy, reflecting again in centralized exams even for PhD admissions as against more robust assessment of research proposals, the future appears uncertain here as well. Fresh evidence-based planning is required on all these fronts, including in skill development along with related education which have hardly

been addressed, as reflected in the continuing complaints by industry regarding shortage of a skilled workforce and lack of employability of among those completing higher education.

There are also highly regrettable tendencies to suppress independent and critical thinking, and a scientific temper, in the educational system both in schools and in higher education institutions, as well as in society at large. School and college curricula and textbooks have been revised in a manner detrimental to knowledge of science and critical thinking. In Universities and colleges, openness to fresh and different ideas is being stifled while certain ideas, ideologies, uncritical acceptance of some received knowledge and even unscientific concepts are being imposed. In the wider society, various pseudo-scientific ideas are being propagated with support of powerful social groups and backing of people holding high office. Such assaults on critical thinking and scientific temper do not bode well for future generations and for the future of our country. AIPSN therefore conducted a national campaign on scientific temper which included an intensive process of drafting a Declaration on Scientific Temper by prominent scientists across the country and adoption of the same at a National Convention in Kolkata on 28 February 2024.

Public health and related state-sector health care facilities continue in serious decline under the twin onslaughts of shortage of state funding of primary health, and privatization. Expenditure on health by Centre and States together amount to only 1.28% of GDP, while out-of-pocket expenses by households on health are twice that amount! Indians already spend a disproportionate percentage of household income on health, of which over 60% is on medicines alone. Government expenditure on health in India is so low that the country ranks 147 out of 184 countries! The low investment in the public health system by the Centre and most States, with the notable exception of Kerala and a very few others, was visibly demonstrated in the poor government response to the Covid pandemic.

The relative privileging of tertiary care institutions, already around 70% of the health sector, continues relentlessly, favouring the better-off and depriving lower-income groups and underserved areas of these services. Various government schemes give private hospitals, now almost like corporate chains, further support them by funneling care payments for government and other state-sector employees to them, almost decimating the more affordable state-sector care institutions. Government funding are instead now extended through private insurance companies, some of which have become corporate billionaires virtually overnight.

The problems in education, health, critical thinking and scientific temper together undermine core democratic values of humanism, pluralism, social welfare and social justice, and are therefore a key Theme of the 18th AIPSC.

Besides these persistent and worsening problems, India is facing a relatively new and dangerous challenge, namely severe and repetitive disasters

caused by climate change but compounded by badly conceived and implemented infrastructure and other activities in the name of so-called "development." Climate impacts have been witnessed since a decade or more, but these have been largely ignored by government officials and the political class, and perhaps even by the public at large, as occasional uncontrollable incidents. In the past few years, however, these have come to be recognized, including by common citizens, as resulting from climate change. Governments at both the Centre and the States can no longer ignore these but are yet to develop a coherent response.

Extreme heat and recurrent, prolonged heat waves including last year in 2023, the hottest year in human history, exacerbated in urban areas by the urban heat island effect resulting from concretized roads and buildings, and denudation of cooling green cover and building over of water bodies. Extreme rainfall, increasingly exceeding 300-400mm in a day or a month's quota of rain falling over just one or two days, is causing severe urban flooding in major cities every year resulting in enormous, recurring economic losses of thousands of crores per city. River floods, cloudbursts and flash floods are occurring regularly in hill and rural areas bringing loss of life and livelihoods, destruction of infrastructure and property. Landslides, land subsidence, even subsidence of whole towns like Joshimath in the Uttarakhand Himalayas are taking thousands of lives each year. Again, these climate impacts are exacerbated by degradation of forests and mountain ecosystems, reckless road construction and infrastructure development in geo-morphologically fragile areas such as in the Western Himalayas and the North East. Sea-level rise and coastal erosion threatens the habitat and livelihoods of tens of millions of people, especially vulnerable sections such as fishers, all along both western and eastern coasts of the Indian peninsula.

It is high time these problems be faced frontally and a National Adaptation Plan for a climate resilient development pathway be framed and adopted through a participatory process involving the States, scientists, academics and other experts, and citizens groups, with adequate funding from the Union Government.

The 18th All India Peoples Science Congress in Kolkata on 27-30 November 2024 is focusing on these major challenges facing the country and its people, and has framed the Theme of the Congress as "S&T for Self-Reliant, Democratic and Climate Resilient Development."