

Session XI

Inclusive Research, Technology and Innovation Policies

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RIS

Research and Information System
for Developing Countries

Inclusive STI: Key Issues and Challenges

- Inclusive innovation has been debated and practised; although the term was not much in vogue.
- Developing countries need cost-effective innovations to address societal problems and support marginalized communities.
- Streamlining the innovation ecosystems to promote supply of cost effective innovations *suited to local needs, driven by individual innovators*, often *outside formal innovation support systems*.
- Need for indicators to assess inclusive STI: *AEI Framework*

Access, Equity and Inclusion (AEI) Framework

- Set of STI indicators on **AEI** at state level, based on **10 indicators** related to health, education and other infrastructure-based parameters to develop a **Basic Needs Index (BNI)**
- The study was conducted for **14 Indian states**, based on data availability for all indicators.
- **Variables for the study:** number of motor vehicles, total surface road length, literacy rate, percentage of population with safe drinking water, number of hospitals and dispensaries, number of hospital beds, enrolment in primary, secondary and higher secondary education, and per capita electricity consumption.
- Preliminary analysis can be accessed at: [Chaturvedi, S., Srinivas, R.S. and Rastogi R. .‘Science, Technology, Innovation in India and Access, Inclusion and Equity: Discourses, Measurement and Emerging Challenges’ .RIS Discussion Papers; No. 202.](#)

Access, Equity, Inclusion (AEI)

- AEI framework envisages criteria to measure effectiveness of S&T policy.
- AEI framework Qualitative and for quantitative we tried to develop indicators.
- RRI: About science for societal good; Through keys it articulates the different dimensions of RRI.
- AEI on distributional aspects of innovation
- Access is important because often, for many reasons, the innovations do not reach those who need it most or accessibility is not considered as part of production and distribution related inequalities. Access is more than an issue of cost or affordability.

Access, Equity, Inclusion (AEI)

- Equity means Innovations are equitable shared different from equality.
- Inclusion means that all those who need it are covered by the processes and mechanisms as they are entitled.
- Thus AEI framework is more than a framework that deals with distribution or impacts. It is an ethical framework that links entitlements with needs, so that ultimately society as a whole benefits from it.

RRI and AEI

- In terms of Gandhian framework this includes Antyodhaya i.e. uplifting of the weakest section of the society and Sarvodaya i.e. Development for all.
- Can responsible research be one that takes into account AEI as an objective to be fulfilled or should AEI be linked more with use and access to innovation than with responsibility in research.

Indicators

- Traditional indicators are not enough for RRI or for AEI. For example DST provides indicators like GERD, patents, No. of women in higher education, publications, FTE researchers in disciplines, R&D per capita, recipients of Phd
- For AEI Basic Needs Index and STI index were developed and methodology is given

Indicators

- Science, Technology, Innovation in India and Access, Inclusion and Equity: Discourses, Measurement and Emerging Challenges Sachin Chaturvedi Krishna Ravi Srinivas Rashmi Rastogi
- Recently the data was updated by Prof. Manmohan Agarwal and he computed Basic Needs Index and STI indices
- The findings indicate that there is no direct correlation between Basic Needs Index and STI index

S&T Indicators	Socio-Economic Indicators	Index for Basic Needs
Number of recognised general education institutions	Death Rate	Health — hospitals, dispensaries and beds
Number of scholars enrolled in general education institutions	Birth Rate	Access to drinking water — percentage of households with safe drinking water
Enrolment in Professional Educational Institutions	IMR	Education — schools and literacy rate
Patent Applications by state	Population below poverty line	
Telephone exchange lines		

Growth and STI index

- The STI is not correlated with the growth rates of the different states either for the same period or a future period (Table 2).
- So, a higher STI does not seem to lead to a higher growth rate.
- However, higher growth seems to lead to improvement in the STI. For instance, the growth rate of the 1990s is not correlated with the STI index of either 1985-86 or 1990-91.

Growth & Dimensions

- “Furthermore, nor do improved social indicators lead to higher growth. This bears out the contention that development is multi-dimensional and this multi-dimensional nature of growth is not necessarily related to increases in income”

Access and Inclusion

- **Ayushman Bharat:** Healthcare to all; Affordable medicines and medical devices
- **Aadhaar:** The digital identification system has enabled the financial inclusion of 1.2 billion people.
- **Atal Innovation Mission (AIM) and Self-Employment and Talent Utilization (SETU)** for entrepreneurship development, particularly in technology driven areas.
- **Gujarat Grassroots Innovations Augmentation Network (GIAN)** to scale up and spawn grassroots innovations and help development of successful enterprises. **The Honey Bee Network** actively scouts for innovations among local communities, helps to build trust and links grass-roots innovators to more formal institutions.
- **NIF** promotes grassroots innovation and encourages commercialization of such innovations.

Public Engagement (PE) and Peoples Science Movements

- What is unique about this mode of PE is that these organizations are not typical NGOs or are run on project mode.
- They are in field for many decades and engage in various fields including health and education.
- In that sense they have a comprehensive understanding of larger issues in innovation across access to education and health.
- But they couch their rhetoric more in terms of science for social transformation than in terms of responsible science.

Public Engagement (PE) and Peoples Science Movements

- Another important factor is that they work with government, through government and also oppose government and hence the terms of engagement are different.
- Hence PE for them goes beyond a single technology and issue.
- This model of PE is more suited for large developing countries where NGO inspired campaigns and single issue based modes of PE may tend to polarize views.
- PSMs and other civil society activities are real grass root engagements as they run campaigns and engage with publics of different types and in different areas, ranging from villages to metropolises.
- Most of this happens in languages of the public.
- Finally PE here is more credible as it is part of larger engagement with public and through public.

In lieu of a conclusion

- We need more rigorous analysis of relationship among indices and examine whether they can be used as alternative indicators
- Measuring AEI through indicators is a work in progress
- AEI indicators have to be tested with different data sets for different countries/states
- The current AEI indicators take macro data for States and examine the co-relation

In lieu of a conclusion

- Measure each of AEI . Example measuring access for the last 5% or 10%, equity- distribution across different groups, inclusion – access to and participation of groups/gender/marginalized groups
- The work being done in RRI indicators will be relevant for this
- RRI, outside Europe, has to be contextualized and adapted
- They can contribute in terms of theory, methodology, and practice

Way Forward

- Regional - level technology bank for technology pooling to share cost-effective technologies related to climate change, health, agriculture.
- Joint R&D and dissemination – CGIAR's Green Revolution, intersecting global science and national needs.
- Capacity Assessment & building Processes vis-à-vis Strengthening Systems of Innovation (SI) at national, regional and global levels.
- Regional Networks among institutions for inclusive research on emerging technologies (AI, nanotechnology, Genomics)
- Facilitating role of agencies like UNESCO, World Bank, UNESCAP