

## India's Research Framework

### What is the issue?

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- India's significance is rising on the world science research stage but it is also facing issues that is undermining the research ecosystem.

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### What are the positives?

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- **UNESCO Science Report 2015** has pointed out that India has become a hub for **low cost innovation**.

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- India has continued building its capacity in low cost engineering.

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- Such an approach has helped in making products affordable to the masses and has also enhanced its export profile.

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- Its progress encompasses various domains like - space technology, pharmaceuticals and IT and more recently, aviation parts.

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- **Global Patent Share** - India stood 7<sup>th</sup> in terms of the number of patents filed by residents and non-residents domestically.

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- The top 6 countries are China, US, Japan, South Korea, EU, Germany.

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- But notably, patents have grown much faster with income in countries like China, Korea, and Japan.

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- **Scientific publications** - It has been growing at an impressive 10%.

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- In terms of scientific output per dollar spent on research puts India on par with the best in the world.

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- This suggests that India is an innovation hub, at least in pharmaceuticals,

computer software and automobiles, where the private sector is in lead.

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### **What are the concerns?**

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- The Indian share in the number of patents sealed in India has fallen from 40% in 2001-02 to 15% in 2015-16.

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- Meanwhile, the number of patents granted by the US Patent Office to Indian applicants has been on the rise, most of them being MNCs.

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- The surge in FDI and R&D activity has led to MNCs accounting for over 80% of patents issued to Indians by the US patents office.

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- This raises questions whether FDI has led to technology assimilation in India, something that China managed to ensure over the last three decades.

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- On technology transfer, there is a lack of coordination between science and technology policy and the Make in India policy.

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### **How has the funding been for R&D?**

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- Central and state governments together set aside Rs. 56,000 crore towards R&D in 2016-17, while the private sector spent about Rs. 43,000 crore.

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- While the private sector seems to have a clear roadmap for the researches it undertakes, the state needs better targeting for its work.

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- **Indigenous technology development** has been sparse except in strategic areas such as space, atomic energy and missiles.

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- **Electronics import** which accounts for above \$40 billion annually is a measure of a lack of technological self-sufficiency.

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- The amount spent as a % of GDP in R&D fell to just 0.69% in 2016-17.

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- India produced only 15,300 PhDs in science, engineering and medicine fields

which is only one-fifth of what china and US did.

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- There is contestations that fellowship stipend is also being cut, which dissuades researchers apart from starving critical projects off funds.

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- Another issue is the unduly prioritising certain niche domains like traditional medicine over other domains of research.

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## **What is the weakness in our education sector?**

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- Quality of research has to catch up with ideas that relate to larger issues in science or society, which has proven difficult.

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- The difficulty is primarily due to the weaknesses in our educational framework, which is more accentuated in the science stream.

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- The university system is in near collapse, due to the dismal state of humanities, and with it the lack of the crucial inter-disciplinary ambience.

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- **Compartmentalisation** - A considerable partition is emerging in research and teaching, with research being considered superior, which is affecting both.

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- As teaching has largely come to be perceived as a distraction to research, there has been a constant push of talent out of classrooms.

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- These attitudes, along with the fact that large grants has been flowing to projects that promise technological outcomes, basic research has suffered.

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- Government has constituted “Indian Institutes of Science Education and Research” (IISERs) for reviving an inter-disciplinary approach.

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- But, this is largely a half hearted effort, as higher education accounts for just 4% of public R&D spending.

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**Source: Business Line**

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