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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- It 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^{th} 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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