

# SWOT Analysis of Indian Science

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## Introduction

Over the years India has emerged as one of the leading nations in scientific research and the biggest achievements have been in the field of space science, nuclear science, communication, medical science and in the agricultural sector. Today, India is surging ahead in the fields of biotechnology specifically in plant and agriculture as well as in medical research as far as stem-cell and cancer research is concerned. Also Nano-technology is the major emerging field. Over the years the Government has made a major surge in investments in these sectors and has also facilitated the establishment of several research institutions in the nation, from the Council of Scientific and Industrial (CSIR) research to Indian Council of Agricultural Research (ICAR), BARC, DRDO, ISRO and many more. These institutions have worked as temples of knowledge and wisdom and have acted as a major catalyst in the growth of scientific research in India since the Independence in 1947.

After over 70 years since independence it is time to do a critical analysis of science and scientific research in the country using SWOT Analysis (Strengths, Weaknesses, Opportunities and Threats). Although it is not a quantitative study, it is quite beneficial to get a rough understanding of where India as a nation sits in the Global Scenario of Scientific Research.

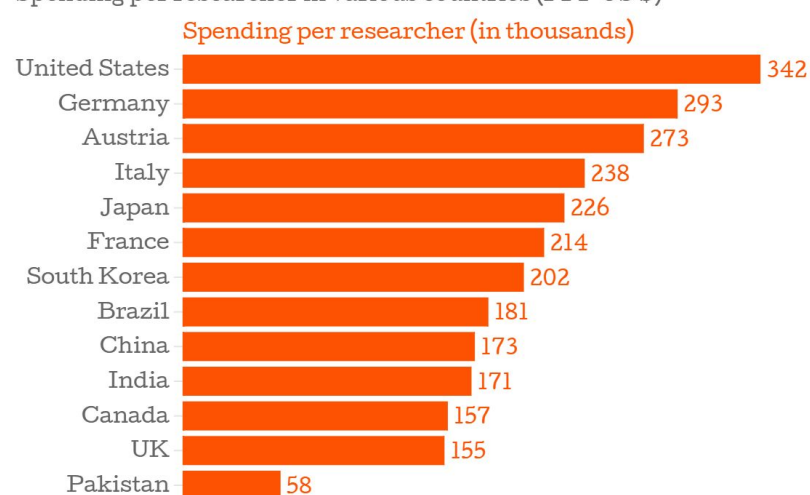


Figure 1 : Some major centres established in India after 1947

## Strengths

- Largest number of qualified scientific manpower.
- Availability of topmost expertise in many research areas.
- Infrastructure facilities built to desired levels.
- Vast scope for encouraging young scientists to pursue research in advanced fields.
- Funds fairly adequate both from Government and private sectors.
- Large number of scientific academies, councils, societies, etc.
- High-quality library facilities with modern communication technologies.
- Publication of a large number of scientific journals.
- Commendable achievements, laurels, recognition.

Spending per researcher in various countries (PPP US \$)



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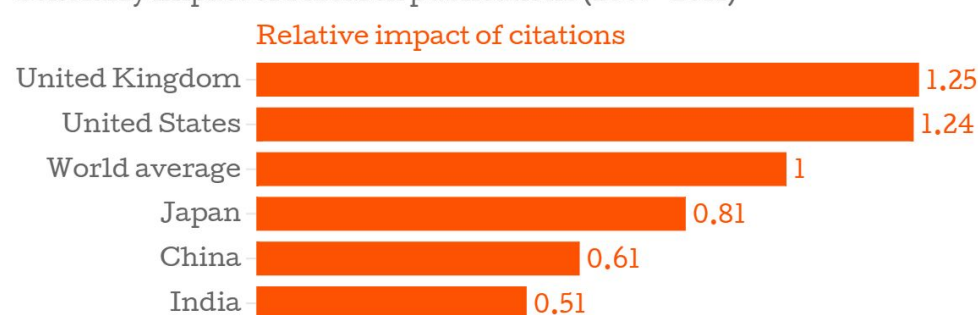
Data: Compiled by the Nature magazine, May 2015

Figure 2 : Science research in India is flourishing despite funding cuts and indifference

## Weaknesses

- Under-utilized scientific manpower.
- Imbalance in research priorities.
- Inadequate facilities in some institutes and poor linkages.
- Lack of incentives and rewards to back-up excellence
- Low priority for standard of research output
- Scientific journals of poor quality.
- Lack of awareness on quality and original research
- Lack of awareness on quality research journals and impact factor analysis citation index/frequency, etc.

Scholarly impact of research publications (2007-2011)



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Data: Compiled by EY, 2013

Figure 3 : Data from Nature on scholarly impact of publications is lowest in India among the major countries.

## Opportunities

- Scope for reorganizing scientific manpower
- Reorientation of research priorities on a national basis.
- Providing opportunities for achieving excellence
- Promotion of team spirit with scientific temper and encourage collaborative research.
- Accelerating inter or multidisciplinary research.
- According incentives/rewards for quality work.
- Counselling on quality of publications
- Establishment of advanced centres for acquiring latest knowledge and encouraging exchange with other centres.
- Promotion of Advocacy in the Scientific community

## Threats

- Exodus of brilliant brains to other countries or "Brain Drain"
- Personality clashes affecting progress in research
- Enhanced level of mediocrity i.e. mediocre research becomes a norm.
- Improper use/ misuse of enormous funds
- Lack of scientific accountability/responsibility

## References

- Rajagopal, V. (2008). SWOT analysis on Indian scientific research. Current science, 94(7), 846-847.
- Figure 2 - <https://scroll.in/article/777202/science-research-in-india-is-flourishing-despite-funding-cuts-and-indifference-says-new-study>
- Figure 3 - <https://scroll.in/article/727743/india-research-report-doctorates-innovation-hrd-shortage>