



सत्यमेव जयते

Department of Science & Technology  
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### **REPORT-9**

## **Reforms Needed in Higher Education Sector for the Promotion of Industry-Academia Interactions**

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## **Introduction**

In developed countries, there is a healthy relationship between R&D of industries and universities. This successful handshake is contributing greatly to the kitty of 'knowledge economy' of the nations. It is a win-win situation for both the parties. Unfortunately, in India, Industry-Academia (I-A) interactions are limited to IITs, and a few universities /govt. sponsored national research laboratories. The number of commercially successful technologies/ innovations is not very encouraging, keeping in mind that India has (a) > 700 universities churning out thousands of 2Ph.Ds, in the area of applied sciences on annual basis and (b) > 300 govt. sponsored research laboratories having thousands of scientists.

Moreover, in developed nations two third of the funds for R&D of public funded institutes are contributed by the private sector, whereas in India, private sector contribution is only one third and the remaining funds are provided by the government.

It is a well accepted fact that in India, the academia and private sector are living in different worlds. Both sectors view each other through a 'tunnel vision.' But, time has come for hand-holding of each other because, in the 21<sup>st</sup> century innovations are the key factor for the survival and growth of an industry. The intelligentsia, which exists in the academic sector, has to be roped in by the industrial sector for novel innovations. In addition, industry has to come forward for contributing more towards finances for R&D in public universities. On the other hand, universities have to work in tandem with industry to produce skilled and industry ready manpower. For these things to happen, a change in the mindset of academia and private sector is the need of the hour.

To address the above mentioned issues, an ecosystem has to be created for stimulating I-A research programmes and increasing funding of R&D programmes of universities by the private sector so as enhance their sustainability. To achieve these goals, following suggestions are being put forward:

### **A) Creation of 'National Level Web Portal'**

Though, Indian academic sector is engaged in applied research of industrial relevance, but the private sector finds it difficult to access the expertise and facilities existing in the academic institutes. Because of advancements in IT sector, industry has no problem in interacting with a scientist or an institute located at a distant place in India. If web portals can be designed and made accessible to Industry, this will be a big step in enhancing Industry and Academia interactions.

It is suggested that 'National Level Web Portal' be made which display following parameters existing in universities and national research laboratories:

- Availability of the type of scientific expertise
- Centres of Excellence
- Availability of infrastructure facilities, high-end Instruments, animal facility, library, workshops, fermentation facility etc.
- Latest technologies, innovative products and patents developed at the institutes
- IPR policy of the institutes
- I-A / Entrepreneurship / Meets, Symposia and Conferences
- Interactive Web Portal (for addressing the needs of the private sector)

Our Centre have created an 'I-A Web Portal' comprising of academic/research institutes located in and around Chandigarh region.

## **B) Networking of Universities with Industries**

There are >1700 DSIR certified labs which enjoy benefits/incentives from the Govt. of India (GoI) for pursuing R&D activities. However, it is being felt that majority of DSIR certified labs are falling short of the research outputs as expected by GoI.

Therefore, it is recommended that:

- a) A tight monitoring of the outcome of R&D programmes of DSIR certified labs be ensured.
- b) To enhance the research capability of DSIR certified labs and also to rope in public sector scientists belonging to professional streams (Engineering, Biotech, Microbiology, Pharma etc) to work on industrial problems. It will be prudent if DSIR certified labs partner with one such university possessing scientific expertise complimenting the type of research being carried out in a DSIR certified lab.
- c) In order to increase I-A interactions, the governing body of industry should have a senior professor/scientist on its Board of Governance and vice versa.

### C) Networking of Universities with National Research Laboratories

- India has over 300 national research laboratories funded by CSIR, DBT, DST, ICAR, DRDO etc. having *state of the art* instruments, which does not exist in most of the universities. These national research labs are spread all over India (Fig. 1).

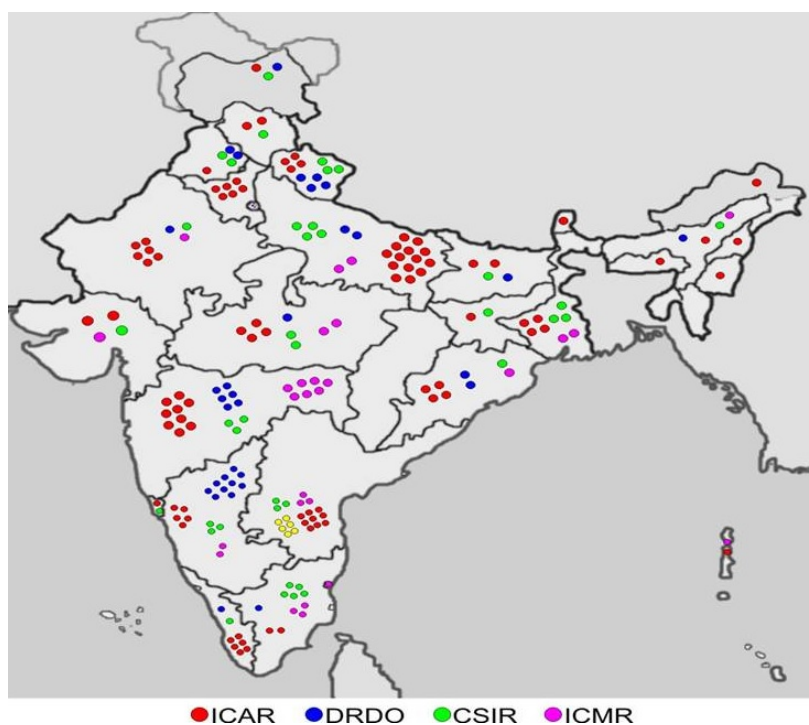


Fig. 1: National Research Laboratories of India

There are nearly 800 universities out of which 77 have been accorded ‘A’ grade by NAAC. Barring a few universities, many are short of high end instruments but rich in intelligentsia (scientists & research scholars). As Govt. of India has limited funds for R&D of public sector, it will be prudent to allow access to high-end facilities of national research laboratories to such universities. This “University-National lab Partnership” will lead to quality research work. Industries will be attracted to universities, provided they have access to research facilities not available in their own institute but existing in nearby national research laboratories. The modalities for the use of such facilities by the universities can be worked out so as not to impinge upon the research environment of national research laboratories.

- It is recommended that each national research laboratory is mandated to partner with at least one university.

#### **D) Setting up of Business & Marketing Entities in universities**

- So far, universities were meant for imparting quality education to the students and not to worry about the financial status of the universities. However, with the passage of time, Govt. is showing its inability for 100% funding of the universities. It is asking the institutions to partially generate their own resources.
- To commercialize the intellectual property of the universities, universities may be permitted to establish a legally distinct non-profit entity such as Society, Trust, Foundation or Section 25 Company to exploit/ market its knowledge base, products, databases etc. on the pattern adopted by CSIR institutions.
- *Suggestions for revenue Sharing for Intellectual Property:* The modalities enumerated below which is adopted by Panjab University for revenue sharing regarding IP may be replicated in other Universities.
  - In case the patent filing costs are not borne by the University, the inventor can first deduct the costs incurred in this regard and maintenance of such patents, till licensing, from income accruing from the commercial exploitation of the patent. Excess income beyond such recovered costs will be shared with the University. Any MoU signed by the PU with the sponsoring agency based on which the IP is generated, or with any patent filing organization, may set aside the provisions under this clause.
  - In case there is a third party, the respective shares of the University and inventors will be calculated on the net receipts after deducting the third party's share.
  - The net earnings generated by the exploitation of IP will be shared between the Inventor(s) and the University on 70:30 ratio.
  - The inventor's share will continue to be paid irrespective of whether or not the individual continues as an employee /student/ research scholar of the University. The inventor(s) share would be declared annually and disbursement will be made to the inventor(s), their legal heir.
  - Co-inventors of IP should sign at the time of disclosure or filing for IP protection, a distribution of the IP earnings agreement, which should specify the proportional percentage distribution of earnings from IP to each co-inventor. The inventor(s) may, at any time, by mutual consent, revise the

distribution of IP earnings agreement.

- If there is only one inventor of the IP, the whole amount of inventor's share will be retained by the inventor. If there is more than one inventor, inventor's share will be distributed among the co-inventors on the mutually agreed terms and conditions.
- If there are two inventors, the principal investigator/supervisor/team leader will get up to 60%, while the co-inventor will get at least 40% of inventor's share by mutual agreement.
- If there are more than two inventors, the principal investigator/ supervisor/ team leader will get up to 60% of inventor's share and the rest will be distributed among the co-inventors in the proportions on the mutually agreed terms and conditions at the time of IP disclosure or at the time of filing for IP protection.
- Students/Project staff may have a share in revenue earned but the share in case of 'work for hire' is not as a right, but may be as an incentive at the sole discretion of the principal investigator or supervisor in consultation with the Director, CIIPP, if the need arises.
- Revenue sharing is not necessarily concurrent with the inventor-ship. Mere assistance like assistance in the preparation and conduct of the experiments, data analysis, etc. does not entitle one for inventor-ship, but may entitle for revenue sharing as an acknowledgement of intellectual contributions for routine/mechanical contribution at the sole discretion of the principal Investigator/ Supervisor of the work.
- If any inventor is unable to be contacted/traced for one year because of lack of information, the revenue corresponding to his/her share will be credited to the IP fund.
- Of the University share, 50% will be used for creating a University's IP fund, which will be utilized for any activity related to commercialization and maintenance of IPR or obtaining IPR in another country, or for capacity building. Further, 10% of the share will be paid to the University as Administrative charges and 40% will be made available to the Department concerned for the purchase of equipments or material or for any academic activity and promotion of industrial partnership.

### E) Suggestions for UGC, New Delhi

- Promotion policy of UGC is highly biased towards publications (research articles, books etc.). Weightage given to technology development, patents, and consultancy etc. is much below expectations. A relook into the promotion policy of university teachers is direly needed.

#### Recommendations for modifications in API Criteria

S. No	API's	Existing		Recommendations
		Particulars	Maximum Points	
1	Consultancy Projects (Clause IIICi)	Amount mobilized with minimum of Rs.10.00 lakhs	10/Rs. 10 lakhs	The lower limit of Rs. 10 lakhs should be amended to include all consultancy projects with scoring scale based on the amount involved
2	Projects Outcome / Outputs (Clause IIICiv)	Patent/Technology transfer/ Product/Process	30/National level and 50/International level	Technology Transfer (TT) need to be given a separate category and enhanced scores in relation to Patents as TT involves more intensive R&D activities and also increased industrial interactions.  The inclusion of Product/ Process under

- UGC should set aside special budget for filing and protection of patents by university professors, as is the practice in CSIR institutions for its scientists.
- To promote the commercialisation of academic intellectual resource (research), it is suggested that UGC-Tech should be established on the lines of CSIR-Tech Pvt. Ltd. which is an initiative of the Council of Scientific and Industrial Research (CSIR), and was founded in 2011 in response to recommendations of a high powered committee constituted by the CSIR (<http://www.csirtech.com/>).
- Faculty members engaged in applied research should avail sabbatical leave to spend time in the industry to understand the industrial environment for at least 6 months at each level (Assistant Professor, Associate Professor and Professor level).

- Industrial consultancies/projects etc should be made mandatory for Associate Professors being promoted to Professor level.

#### **F) Suggestions for Universities**

- Industry should be involved from the very beginning of the university research projects having industrial implications. Using this approach, the project will be more focussed and shorten the time for commercialization of the technology developed.
- Crash-courses on Business Management for science faculty.
- A serious re-look is needed on the academic syllabi of science subjects. Syllabi should be in tune with the requirements of the industries. Dedicated courses on entrepreneurship development, IPRs and business management programmes should be introduced.
- In universities engaged in applied-research, Govt. may set up 'Industrial Zones' which cater to entrepreneurship programmes, business management programmes, space for incubates/ start-up companies. This facility may be created under PPP mode.
- Universities should have an *Industry Web-Portal* catering to
  - Latest technologies which can be adopted by industry
  - Patents held by the universities
  - Start-up companies by university alumni
  - Innovative products generated
  - Entrepreneurship programmes
  - Availability of jobs in the public and private sectors
  - I-A meets / IPR / Entrepreneurship meets
  - Business Management programmes
- Each academic institute should have web portals of databanks for easy access by the industrial sector. Suggested databanks are as under:
  - Availability of scientific expertise in the universities
  - List of high-end instruments
  - List of infrastructure facilities like animal facility, library, workshops, fermentation facility etc.