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# **Sharing Public-funded R&D Resources – Guidelines**

**Office of the Principal Scientific Adviser to the  
Government of India**

**July 2019**

## Sharing Public-funded R&D Resources – Vision and Policy Framework

### Preamble:

Infrastructure investment for conducting R&D in national R&D Labs; branches , divisions and projects of Central Ministries/ Departments; institutions of higher learning ; autonomous bodies engaged in scientific R&D; and schools, colleges and universities are invariably supported by the Central Government. Though not hard-coded, it was always expected that facilities established through such financial support be made available to those in need of them and also qualified to make use of such facilities for their own research work. This intent is seen in the sanctions issued to the project proposals by the funding agencies of the Government informing inter alia that de jure ownership vests with the Government during tenure of the project , and ownership transferred to the grantee on the condition that the funded infrastructure is shared with researchers in a manner that sub-serves the greater public good.

Implementation of a sharing policy has never been easy or straightforward owing to paucity of information with researchers about the existence or otherwise of R&D infrastructure at any specific site or region or centre or institution; lack of either an Institute level or centrally administered policy on sharing; and lack of coordination inter se among the researchers on one side and the Institutes/ Ministries on the other. This has led to avoidable duplication of investment in R&D infrastructure, low and unsatisfactory levels of utilisation and in general inefficient and wasteful use of public investment.

It however has been possible lately with use of advanced technology enabling different agencies of the Government to create and maintain an updated national and regional “inventory of resources” created through their funding, and to coordinate their investment across the country and within regions, to ensure the most effective use of public funds meant for conducting R&D. Thus it is possible today – through a Web-based Portal - to match users with the infrastructural resources that they need in an objective and transparent manner. This has the potential for revving up R&D productivity and enhancing the effectiveness of public investment. Appropriately, the motto is ***“Linking Researchers and Resources”***.

Sharing of publicly-funded R&D resources has become ever more urgent owing to the very high cost of equipment and facilities, and costs laid out over their further operation/maintenance. Further, due to the rapid obsolescence of R&D facilities, it necessitates frequent up-gradation of equipment and facilities entailing further costs over the useful economic life of the funded assets. While costs are a price that one pays to remain relevant in the increasingly competitive environment in global R&D, there are definite advantages including considerations of economy in laying out a policy document for working collaboratively under a codified national sharing policy .

Sharing Policy not only lays down the pathway for a rational deployment of R&D resources through a mechanism of sharing of equipment and facilities but also includes modality of sharing operational and maintenance expertise, including history of maintenance and troubleshooting; sharing of spares and other consumables wherever appropriate and possible; sharing of performance history with users and potential customers within the country; sharing of vendor performance within the country and elsewhere; and most importantly, sharing of technical expertise and experience in various domains with researchers from around the country.

#### **Elements of the Policy of Sharing:**

**Objective:** To provide access to all functional, public-funded R&D infrastructure to those who need it, in an open, transparent, and timely manner, so as to promote more efficient use of public investment and to enhance R&D productivity in the country. Access may be provided for a fee, at subsidised rates or free of cost. An on-line network (hosted in the Cloud) will be set up to match contemporaneously the demand and supply sides and by ensuring access to the portal around the clock.

**Scope:** The proposed R&D resource sharing policy covers all public-funded R&D organizations including (a) Government Autonomous Bodies whether administratively created or created through Statutes;

(b) Attached and Sub Ordinate Offices;

(c) R&D Projects directly run by Ministries/ Departments including Centers, Field Offices, Branches etc

(d) Public-funded Educational Institutions-

irrespective of the quantum or nature of funds, whether recurring or non-recurring, or core or project etc ( for all cases from (a) to (d) supra)

and (e) all such Organizations and Entities in the Private Sector or the Joint Sector, which have received government grants for conducting R&D.

#### **Instruments for implementing the Policy:**

A Portal shall be established on the World-Wide Web, which will have an up-to-date list of all functioning R&D equipment/facilities procured through Government grants, located at various Institutions/ Organizations/ Entities in the country and will be made open to the public. The Web Portal shall be called the "I-STEM" Portal, standing for Indian Science, Technology, and Engineering facilities Map".

All grantee Institutions/ Entities/ Organizations shall be, by mandate of the granting Government agency, required to list said equipment/facilities on the I-STEM Portal only. This mandate is consistent with the import of the standard terms and conditions related to sanctions issued for R&D Programs and Projects.

### **Incentives:**

To ensure that all functioning equipment/facilities funded by Govt. agencies are listed on the I-STEM Portal, PIs with an established record of sharing their facilities with others researchers within/outside their institution may receive preferred consideration while seeking public funds in the future for procuring new equipment and facilities. Institutions that encourage their PIs to share equipment/facilities through I-STEM, and offer institutional facilities for sharing, may be given appropriate "credit" that counts towards their national ranking.

### **Methodology:**

The policy of sharing publicly funded R&D infrastructure shall be implemented through the creation of secure Web-Infrastructure (Portal) to collect up-to-date and detailed technical data and information about Govt.-funded R&D equipment and facilities installed in various Institutions/ Entities/ Organisations (including National Research Labs established under administrative control of DRDO, ISRO, CSIR, IARI, ICMR , DAE , DST, DBT, Ministry of Electronics and Information Technology, MNRE, MOHFW, MOEF& CC and all Ministries/ Departments of Central Government engaged in running R&D programs and projects, Educational institutions running under the administrative control of MHRD, entities in private and joint sector receiving government assistance for conducting R&D). This information will be made available on a Pan-India Map on a dedicated web portal.

The portal shall be designed in such a way so as to protect the integrity of the database of equipment and facilities listed on it by various Institutions/ Entities/ Organizations; to protect the integrity of technical data produced by users and custodian Institutions through access to equipment and facilities listed on the portal; to ensure that the technical data generated by a user through access to equipment/facilities listed on the portal are perpetually in exclusive ownership of the user and may not be shared by the custodian of said equipment/facilities without permission of the user.

Awareness meets shall be conducted in various parts of the country to brief institutions and prospective users about the web portal, its design, and how it can be used by custodian Institutions, researchers, equipment manufacturers, operators/technologists, and equipment users. In particular, provision will be made for the registration of custodian Institutions, custodians, equipment operators/technologists, and equipment users.

A Nodal Office shall be set up at Indian Institute of Science, Bengaluru or as decided by the office of the PSA to Government of India to establish, operate, and maintain the I-STEM Web Portal. All efforts shall be made to ensure that the portal is secure and maintained through constant up-gradation and through appropriate testing and certification. The portal shall also have built-in provision to protect the privacy of users, security and privacy of the

technical data generated by users, and to preserve the integrity of the technical/experimental data generated through the use of the portal and through institutional participation in the portal.

An appropriate mechanism shall be arrived at for funding the operation and maintenance of the I-STEM Portal and the Nodal Office in the long term.

#### **Detailed Methodology:**

Implementation of the Policy of sharing Public-funded R&D Resources comprises the following elements:

- a. Implementation of a web-based, 24x7 arrangement for the reservation of equipment listed in the portal by users. Based on such reservation, utilization of equipment/facilities in a systematic, reliable manner convenient both to users and to the custodians.
- b. Building a nationwide database of experts in various research fields and various types of analysis, so that users of the network facilities can seek the assistance of experts when required. Experts may be from public or private institutions, including private companies.
- c. Building an on-line library (as part of the on-line network) of exemplary practices and experimental data/analysis, provided by users of the national network of equipment and facilities which will serve as guidance to users.
- d. Building a database of service/maintenance engineers nationwide, who can help to maintain the equipment/facilities in good condition.
- e. Building an on-line forum through which users can seek and obtain help and guidance from other users and experts.
- f. Integrating a payment mechanism in the on-line portal so that users can pay to use facilities.
- g. A call centre with a toll-free connection shall be set up so that users may seek help and clarification.
- h. The portal shall have a mechanism for handling grievances of users as well as those of participating institutions.
- i. Public funded Academic Institutions, National Labs, autonomous bodies/ attached and subordinate offices of Ministries and Departments, and PSUs are expected to list all public-funded, operational and useful equipment/facilities in their custody on the I-STEM Portal, regardless of whether the funds were provided by an overseas agency. All said entities are encouraged to list also those equipment/facilities acquired entirely through private funding.



j. The fee charged for the use of any equipment/facility will be as decided by the concerned Institution/ Entity/ Organization in terms of the governing Institutional Policy.

k. The fees collected by an institution (through the online payment gateway provided on the I-STEM Portal) will accrue to the custodian Institution, and expected to be used towards the operation and maintenance of the equipment/facilities through which fees are generated. Funds generated in excess of what is required for operation/maintenance of a given equipment/facility may be used by the custodian Institution to support R&D within the Institution, or to restore equipment that may be out-of-order for a long time, or to fund the development of indigenous equipment and indigenous spare parts as a measure to minimise on imports.

### **Regional Hubs:**

An essential aspect of making the I-STEM Portal effective and widely utilised is the formation of “Regional Hubs” in various parts of the country, which will be led by researchers in the region. Such hubs will ensure that public-funded equipment/facilities in the region become part of I-STEM and are kept in working order so that they are available in a reliable manner to others in the region (as well as those outside that region). For example, critical spare parts and accessories may be procured by Institutions in a Hub to serve other Institutions in the hub. The institutions in a hub will work together to deploy resources to contribute to the enhancement of regional development, e.g., by offering of resources to regional industry, esp., start-ups.

### **Benefits:**

- i. Avoidance/minimization of duplication of equipment/facilities in a given institution, in nearby institutions, and in a given region.
- ii. Greater degree of utilization of public-funded R&D facilities, leading to enhanced R&D productivity throughout the country. This will translate to improved research outcomes, both in terms of a larger number of researchers who are well-trained and in enhancing the possibility of problem-solving and of generating innovations.
- iii. Availability to all funding agencies an up-to-date inventory of public-funded and functional equipment and facilities. This will help agencies make decisions on whether to fund the procurement of eqpt requested in newly submitted proposals.
- iv. Availability to all funding agencies an up-to-date data on sharing of facilities by Institutions, with users within it and those external to it. This will help agencies ensure that sharing becomes the norm and to provide incentives to extend sharing. This will also help Institutions improve their national ranking through sharing equipment/facilities pro-actively.
- v. Availability of access to R&D facilities for researchers in smaller and more remote institutions will create a “level playing field”, potentially leading to manifold increase

in number, level and quality of innovation from these researchers/institutions, to the benefit of the whole country.

- vi. Inculcation (over time) of a spirit of cooperation and collaboration among the R&D community of the country, both from academia and industry.
- vii. Training of an increasing number of technicians capable of operating advanced equipment, capable of trouble-shooting such equipment and fixing them, so that the steep cost of servicing by foreign technicians is reduced over time.
- viii. Revival of idle, but expensive, equipment through the development of indigenous capability in servicing equipment/facilities.
- ix. The above capability will help kindle the spirit of entrepreneurship in the R&D community to develop advanced R&D equipment (and sub-systems for such equipment) indigenously through the formation of start-up companies.
- x. Both the training of technicians and the seeding of start-ups has the potential for generating significant, well-paid employment in various parts of the country, as such activity can be promoted by I-STEM through regional hubs.