

Executive Summary

Why did we decide to examine this issue?

Government formulated the Tenth Five Year Plan with high expectations from Science and Technology sector in contributing to growth rate of the economy. As Council of Scientific and Industrial Research (CSIR) had developed knowledge networks across its constituent laboratories, the Planning Commission suggested that Research and Development (R&D) efforts of CSIR should be consolidated and inter-institutional R&D projects should be taken up. Consequently, in Tenth Five Year Plan, CSIR adopted a new approach in selection and implementation of in-house R&D projects in its constituent laboratories by introducing network projects.

Network project was defined as a project, where more than one CSIR laboratory collectively source inputs and implement the identified objectives together. Emphasis was laid on networking of resources and capabilities of CSIR. According to the guidelines for network projects, the projects aimed at 'generation of knowledge, usable knowledge and useful knowledge as products. Therefore, those projects which target usable and useful knowledge as products are expected to afford commercialisable results'.

During Tenth Five Year Plan, CSIR took up 54 network projects/programmes at estimated cost of ₹1860 crore. The emphasis of Planning Commission on consolidation of R&D efforts of CSIR laboratories and new methodology adopted by CSIR for implementing R&D projects in networking mode, together with significant financial outlay involved, prompted us to undertake performance audit of network projects.

What were our audit objectives?

Audit was conducted with a view to examine:

- whether these projects were planned and executed efficiently and effectively in accordance with the guidelines laid down for network projects;
- whether monitoring and evaluation mechanism of network projects was effective; and
- whether expected benefits from projects in terms of generation of external cash flow, publishing of research papers and filing of patents were achieved.

What did Performance Audit reveal?

Audit selected 27 network projects for detailed examination. Performance Audit revealed that:

Planning, execution and monitoring of network projects

CSIR formulated the guidelines for network projects only in September 2004, more than two years after commencement of Tenth Five Year Plan. By then, 26 out of 27 selected projects had already been sanctioned.

There were delays in sanctioning projects, due to which actual commencement of the projects was delayed by periods ranging from 12 to 34 months from the scheduled date of commencement i.e. April 2002.

Project proposals of 10 projects did not include any details of targeted outputs and measurable deliverables viz. financial, economical, technological and societal benefits over the five year period, as was required under the guidelines. Absence of deliverable parameters made defining the success of network projects more abstract rather than concrete.

In five projects, laboratories failed to identify and involve industry at any stage during implementation of projects, even though it was stated in the guidelines that it was necessary to involve industry at some convenient stage of the project.

38 items of equipment (each costing more than ₹10 lakh) costing ₹48.73 crore from 15 projects, were received/installed/commissioned either after completion of project or at the fag end of project duration. This resulted in non-utilisation of equipment for the intended purpose.

There was shortfall in meetings of Task Force (TF) and Monitoring Committee (MC) against prescribed frequency, in 15 and 19 projects respectively, ranging between one to 90 *per cent*. Recommendations made by MC during its review of projects were not followed in two projects.

Although network projects was a new initiative and was viewed as providing a new learning experience to CSIR, it neither carried out impact assessment of network projects on its own nor did it engage an external agency for the same.

(Paragraphs 2.1 to 2.7)

Outcome of network projects A total of 399 technologies were developed from 27 network projects, of which 51 technologies were transferred to end users, 38 technologies were commercialised and revenue of ₹3.83 crore was realised as of July 2012.

The research carried out with a total expenditure of ₹621.80 crore resulted in commercialisation of only 10 *per cent* of the technologies developed and revenue generation of less than one *per cent* of the total expenditure on network projects.

264 patents were filed out of which 103 patents were granted. Out of 264 patents, only 41 patents constituting 16 *per cent* were filed jointly in networked mode.

A total of 2,008 research papers were published. There were no joint publications in 17 out of 27 network projects. 677 papers (34 *per cent*) out of 2,008 had a journal impact factor of zero. 1,298 papers (65 *per cent*) had journal impact factor below 2 and 1,902 (95 *per cent*) papers had journal impact factor below 5.

Total external cash flow (ECF) from 27 network projects was ₹79.74 crore. There was no ECF from nine network projects. Total expenditure incurred on these projects was ₹199.16 crore.

(Paragraphs 3.1 to 3.4)

Audit findings from specific projects Animal models developed by CDRI under a project executed at a cost of ₹30.56 crore could not be submitted to international agencies as the tests were carried out in facilities of CDRI that did not have GLP¹ accreditation, which was a necessary pre-condition.

Equipment procured at cost of ₹14.05 crore under a project taken up by CRRRI remained unutilised, due to delay in procurement and injudicious procurement.

Five single molecules developed by CSIR Headquarters under a project executed at a cost of ₹32.77 crore could not be taken to IND² stage, as CSIR could not establish facilities for testing the single molecules.

(Paragraphs 4.1 to 4.3)

¹ Good Laboratory Practices

² Investigational New Drug

What do we recommend?

- CSIR may ensure timeliness in sanctioning plan projects having a definite time frame of implementation.
- CSIR may ensure that in future, comprehensive project proposals containing defined and measurable deliverables expected to be achieved from the project are prepared.
- The objective of CSIR being scientific and industrial research, adequate and minimum interaction with appropriate industry leading to commercialisation of its research should be formalised and monitored, for its projects.
- CSIR may ensure timely procurement of equipment and their installation so that equipment are utilised in projects under which they were procured.
- CSIR may ensure that meetings of various monitoring committees are held as per prescribed frequency.
- In future, formal impact assessment of important projects may be done by involving outside experts along with CSIR's own experts.
- CSIR may ensure that targets are set in a judicious manner after assessing the available resources and associated risks of research, so as to present a realistic picture.
- CSIR may ensure that resources required for a particular project are planned in advance and optimally utilised so as to avoid adverse impact on outcome of project.