

Chapter VII: Conclusions and Recommendations

7.1 Conclusions

Audit concluded that infrastructure creation in the IITs were deficient as many state governments concerned did not make the requisite land available to the IITs, hindering infrastructure development. Projects taken up under Phase-I and Phase-II suffered from large delays in construction and in execution of works, thus rendering the planned infrastructure not being available to students in all the eight IITs. Further, there were instances of non-compliance of statutory requirements for construction of buildings, delays in tendering, awarding contracts on nomination basis, instances of undue benefits to consultants/contractors, instances of facilities created but not used due to delays in completion/deficient construction. Delays were also noticed in supply and installation of equipment due to non-readiness of site/non-availability of required infrastructure. Audit observed that the availability of laboratory facilities in respect of four IITs was deficient. Thus, students were deprived of the indented benefits of an efficient learning environment.

Audit observed that there were infirmities in the financial management exercised by the IITs. The capital outlay had to be revised as there were delays in taking up the construction of infrastructure development. There was slow utilization of Japan International Cooperation Agency (JICA) Loan which inhibited the growth of IITH campus in a timely manner. IITs were unable to generate sufficient internal receipts and thus remained dependent on the government for grants.

Regarding academic programs and research, it was seen that two IITs (IITBBS and IITJ) could not introduce the targeted number of courses. None of the eight IITs could attain the stipulated cumulative intake of students at the end of the sixth year. There was a shortfall in enrolment into PG programs in all the eight IITs. Five IITs (IITI, IITJ, IIT Mandi, IITP and IIT Ropar) did not fix an intake for the Ph.D courses while the rest had shortfalls in admissions in these courses. IITs had vacancies in faculty positions which would adversely affect the ability of IITs to provide quality education. Further, the representation of reserved categories of students' enrolment in most the IITs was very low. It was also seen that all the IITs received very low levels of funding for research projects, sponsored from non-government sources. Thus, they remained dependent on the government for funding of their research activities. There was also a large variance between the patents filed and obtained by all the eight IITs and no patents were obtained during the five-year period, indicating that the research activities could not bring out fruitful results. Research and Technology Development Council to guide research activities was not set up in four IITs.

Audit observed that the governing and oversight bodies existing in the IITs did not provide effective stewardship and management of resources. There were shortfalls in number of meetings held by the BoG, Senate, Finance Committee and BWC in all IITs during the five-year period 2014-19. Further, specific instances of lapses due to inadequate working of the governing bodies was also observed in four IITs.

7.2 Best Practices

The DPR envisaged good practices like sufficient green cover, energy conservation, rainwater harvesting, wastewater treatment etc., to be adopted during development of the campus. Audit observed the following good practices in the various IITs.

- IITGN campus has developed water management system comprising of raw water received from the Narmada Canal and its own Water Treatment Plant (WTP) with chlorination arrangements and distribution channels. A Sewage Treatment Plant (STP) has been set up and the treated water is primarily used for irrigation purposes. Also, Solar collectors with inverters were installed without battery storage system and are being used to provide energy to the Academic Complex and student hostels during the day. During construction period of 2013-2015, nearly 15,000 trees of native varieties were planted.
- In IITI, a water recycling plant and sewage treatment plant has been installed. Also, rooftop of seven buildings have been equipped with solar panels which are integrated with electrical sub-stations.
- In IIT Ropar, treated water is reused for harvesting. Further, more than 7,000 trees were planted for afforestation of campus. Rooftop solar panels have been mounted on few buildings.
- In IITP, STP has been used to conserve water in order to have a sustainable environment. Further, rooftops of majority of the buildings of the IIT have been covered with solar panels.

7.3 Recommendations

1. *The Ministry, in coordination with IITs, may take proactive steps with the state governments for ensuring the land availability to IITs is as planned and suitable for development of permanent campus to create the intended intake.*
2. *Infrastructure growth may be speeded up to ensure requisite sites are ready for procurement and timely installation of scientific equipment to ensure that faculty and students avail the benefit of these resources in time and achieve the intended research outcomes.*
3. *The Ministry and IITs may identify avenues for generation of adequate internal resources in order to reduce the dependency on government grants and strengthen the financial position of all IITs.*
4. *The IITs may take steps to increase the number of courses as well as student intake, in line with targets set out in the DPR to ensure availability of quality education to a larger pool of students.*
5. *The IITs may periodically review the availability of faculty and the means of attracting faculty to fill the vacant positions and to maintain adequate FSR.*

6. *Being premier engineering and research institutes, measures may be taken by the IITs to focus more on research by means of papers published, patents granted as well to attract funding from non-government sources to develop research and technology-oriented atmosphere.*
7. *IITs may fix targets for enrolment in PG and Ph.D programmes and make efforts to ensure that these targets are met.*
8. *MoE may take steps to galvanize the Council of IITs as well as Senate of each IIT so that new teaching methodologies, introduction of topical courses, setting high academic standards are attained, so that the IITs meet the emerging manpower needs of the country.*
9. *Governing bodies should exercise greater supervision over the activities of IITs for effective functioning and should meet as frequently as mandated in Act/Statute.*

The MoE accepted most of the audit recommendations and has circulated these to all the IITs for acting on the recommendations.

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(PRAVIR PANDEY)
Director General of Audit
(Home, Education & Skill Development)

Countersigned

New Delhi
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(GIRISH CHANDRA MURMU)
Comptroller and Auditor General of India

