Summary of the Terminal Evaluation

I. Outline of the Project	
Country: The Republic of India	Project Title：Project for Future Researchers at IITH to Enhance Network Development with Scholarship of Japan in the Republic of India
Issues/Sector: Higher Education	Estimated Total Cost: Approx. JPY 2 billion (as of January 2020) Initial plan: Approx. JPY 770 million
Division in Charge: Natural Technical and Higher Education Team, Higher Education and Social Security Group, Human Development Department, JICA	Cooperation Scheme：Technical Cooperation Project
Period of Cooperation:(R/D) January 2012 – March 2024 (147 months) Initial plan: January 2012 – March 2020 (99 months)	Related Organizations in Japan: [Academic institution] University of Tokyo, Hokkaido University, Kyoto University, Osaka University, Nagoya University, Tohoku University, Kyusyu University, Saitama University, Shimane University, Waseda University, Keio University, Yokohama National University, Shizuoka University and Ritsumeikan University [Industry] Institutions which signs MoU with IITH Hitachi Zosen Corporation, Isgec Hitachi Zosen Ltd., Joining and Welding Research Institute Osaka University, JFE Steel Corporation, Allied Telesis Labs, NAGOYA ELECTRIC WORKS CO.,LTD., Chaintope, asahi-kasei.co.jp・Asahi kasei Microdevices, KDDI Research, Inc, Weathernews, NTT Advanced Technology Corporation (NTT-AT), Toshiba Memory Corporation, TerraDrone, Takenaka Corporation
Counterpart Agency：Institute of Indian Technology, Hyderabad (IITH)	

1-1. Background of the Project

India is realizing tremendous economic growth in recent years with more than 8% annually. Human resources particularly in science and technology is key to sustain and accelerate Indian development. Establishment of the first Indian Institute of Technology (IIT) at Kharagpur in 1951 made a historical beginning of high-quality institution of technology, followed by six other IITs, at Bombay, Madras, Kanpur, Delhi, Guwahati and Roorkee. Encouraged by the success story of IITs, and in order to meet the pressing need of more high-quality graduates, the Government of India (GOI) has established from 2008-09, eight new IITs, at Hyderabad, Indore, Gandhinagar, Patna, Bhubaneshwar, Jodhpur, Ropar and Mandi with aiming at further socioeconomic development and meeting expectation from industrial sectors. With the addition of some more IITs after 2014, at present there are 23 IITs.

Based on the commitment in August 2007 between both Prime Ministers of India and Japan, collaboration between IIT Hyderabad (IITH) and Japan has started. IITH greatly values the assistance for research and studies in five identified areas (Next Generation Communication Technologies (NGCT), Design and Manufacturing (DM), Sustainable Development (SD), Environment and Energy (EE) and Nano-Technology and Nano-Science (NTNC), the construction of buildings and the procurement of equipment necessary for high-end research.

The Salient Project Report submitted by IITH to the Ministry of Human Resource Development (MHRD) and Japan International Cooperation Agency (JICA) in July 2010 proposed that, in addition to the ODA (Official Development Assistance) Loan, the Government of Japan (GOJ) consider grant assistance of Rs.100 Crores for faculty members and scholarships for students who pursue joint research in Japanese universities.
Against this background, the application form of the Project was submitted from GOI to GOJ on 23rd September 2011 and the Project started in January 2012.

From February 15 to 29, 2020, JICA dispatched the Terminal Evaluation Team to verify the accomplishments of the Project, analyse the Project based on five international evaluation criteria and draw recommendations for the rest of the project period.

1-2. Project Overview

This Project aims to establish research network between IITH and Japanese academic and industrial

partners by developing the human resources for research at IITH through accepting trainees at Japanese academic and industrial institutions and by strengthening the cooperative relationship between IITH and Japanese partners. Besides, it is expected that this will contribute to promote the leading-edge education and technology in the field of engineering at IITH.

(1) Overall Goal
Educational and research activities of IITH are further developed through the world-class research network between IITH and higher education institutions/industrial clusters of Japan, and both IITH and Japanese universities can establish educational and research excellence in the field of science, technology and engineering in the future.

(2) Project Purpose
Research network between IITH and first-rate higher education institutions/ industrial clusters of Japan is enhanced through the interaction of human resource in educational and research activities between IITH and Japan.

(3) Outputs
1) IITH graduates who obtained Japanese PhD degree or double degree between IITH and Japanese Universities contribute to educational and research activities.
2) Interactive relationship between IITH and the first-rate higher education institutions of Japan is established.
3) Interactive relationship between IITH and industrial clusters of Japan is established.

(4) Inputs
1) Japanese Side: (as of January 2020)
a. Long-term experts: 5 experts for a total of 191 months, Scholarship program: 116 grantees
b. Fellowship program: 153 IITH faculty members
c. Dispatch of Japanese faculty members: 119 Japanese faculty members
d. Support programs for IITH graduates before/during the study in Japan
e. Local operational cost: JPY 176 million

2) Indian Side:
f. Office space for Japanese faculties at IITH
g. Placement of faculty and staff: 5 faculty members for the 5 research areas and related managers
h. Venues for the orientation for the participants before visiting Japan

II. Overview of Evaluation Team

Terminal Evaluation Team

Name	Position	Affiliation
Dr. B.S. Murty	Leader	Director of IITH
Dr. Sireesh Saride	Evaluation	Professor Civil Engineering, SD in charge and Dean Planning
Dr. Ch. Subrahmanyam	Evaluation	Professor, Chemistry, EE in charge and Dean Academic
Dr. Shiv Govind Singh	Evaluation	Professor, Electrical Engineering, NTNS in charge
Dr. S. Surya Kumar	Evaluation	Associate Professor, Mechanical & Aerospace Engineering, DM in charge
Dr. Kiran Kuchi		Professor, Electrical Engineering, NGCT in charge
Dr. Siva Kumar	Evaluation	Associate Professor, Electrical Engineering, Dean IAR
Dr. Kyoko Nakano	Leader	Senior Advisor (Higher Education), Human Development Department, JICA
Mr. Yoshinori Mori	Cooperation Planning	Technical and Higher Education Team, Higher Education and Social Security Group, Human Development Department, JICA
Ms. Ai Ishitobi	Evaluation Analysis	Tekizaitekisho LLC Consultant

Period of Evaluation: February 15, 2020 - February 29, 2020	**Type of Evaluation:** Terminal Evaluation

III. Results of Evaluation

3-1. Achievements

Output 1 : IITH graduates who obtained Japanese PhD degree or double degree between IITH and Japanese Universities contribute to educational and research activities.

Through Output 1, the Project successfully advertised the scholarship program and increased the number of applicants for the program and its grantees. By the terminal evaluation, 116 IITH graduates received the postgraduate scholarships in Japan. Japanese supervisors who responded to the questionnaire referred to the positive impacts on their laboratories or universities by receiving the grantees. Teachers of Japanese universities which have accepted the grantees referred to the positive impact to their laboratories and university life as a whole by their strong enthusiasm toward new knowledge, technology and study.

Through the questionnaire survey and interviews, IITH faculty members pointed out that joint supervision of postgraduate students and/or the exchange of postgraduate students would be more effective to further promote research collaboration between IITH and Japanese universities.

Output 2 : Interactive relationship between IITH and the first-rate higher education institutions of Japan is established.

Output 2 progressed well. The fellowship program enabled faculty members of IITH and Japanese universities to establish and strengthen the network among them, which resulted in 7 joint international conferences/symposium, 10 joint research projects and 72 joint publications (and more to be published in the near future). Most joint papers were published at high impact journals and more joint papers and research proposals were under preparation at the time of the terminal evaluation.

Output 3 : Interactive relationship between IITH and industrial clusters of Japan is established.

Through various activities under Outputs 3, the network between IITH and Japanese companies started to be established and this resulted in the increased numbers of IITH students who participated in internship programs at and those who were hired by Japanese companies. The established network with JETRO also contributed to the achievements. The network led to the research collaborations with industry although the field for the collaboration is still limited.

Prospects for achieving the Project Purpose:

The Project Purpose is achieved as all indicators are achieved at the time of the terminal evaluation. The status of indicators to assess the Project Purpose shows that 36 scholarship grantees have obtained a position at a Japanese or Indian academic institution or industry; 88 IITH graduates have obtained a position at a Japanese academic institution or industry (in Japan, India, or other countries.); 32 MoUs are signed between IITH and Japanese academic institutions; and 15 MoUs are signed between IITH and Japanese industries.

3-2. Evaluation Results by Five (5) Evaluation Criteria

(1) Relevance: High

The relevance of the Project is high as the Project is aligned well with the Indian Education Policy, the Japanese Assistance Policy to India and the mission of IITH. The approach the Project adopted ("All-Japan Approach") was also appropriate and indispensable.

(2) Effectiveness: High

The effectiveness of the Project is assessed as high since the indicators to assess the Project Purpose were already achieved at the time of the terminal evaluation, as noted above at "Prospects for achieving the Project Purpose". Most recommendations made at the Mid-Term Review (MTR) were also well followed up by the terminal evaluation, except for the one recommendation on the promotion of effective information-sharing among primal stakeholders since Joint Coordinating Committee (JCC) or a stakeholder meeting among prime stakeholders were held only four times for the past 8 years before the Terminal Evaluation. External factors listed in Project Design Matrix (PDM) did not affect the Project by the time of the terminal evaluation.

(3) Efficiency: Slightly low

The efficiency of the Project is assessed as relatively high as most inputs (the assignments of JICA long-term experts and IITH faculty members, the scholarship and fellowship programs, a research funding program called Collaboration Kick-starter Program (CKP), local operational costs and support programs

for the scholarship grantees) were well utilized to produce the expected outputs. On the other hand, the interviews with IITH faculty members indicated that the joint supervision of scholarship students and the extension of CKP for three years (two years in this project) would be more efficient to produce further outputs.

As mentioned in the "I. Outline of the Project", the duration the Project was extended by 4 years from the initial plan. This is owing to the facts that the target number of overseas students was announced at the joint statement after the India-Japan top-level conference in December 2015 and the expectations from IITH toward the IITH scholarship students as a pivot of cooperation increased.
The total amount of cost almost tripled from the initial plan, as the necessity of further activation of research and human resource exchanges between Indian and Japanese industrial and academic institutions was realized. As it is recognized that every activity caused by these changes had contributed enough to the achievement of the Project Purpose, it can be said that these changes do not damage the efficiency of the Project.

(4) Impact: High

Impact is assessed as high given the status of indicators to assess the achievement of the Overall Goal and positive impacts of the Projects observed by the terminal evaluation. Additionally, as a part of student exchange programme between IITH and Japanese universities, partnership with other scholarship programmes, such as JST[4] Sakura Science, JASSO[5] Fellowship Programmes and so on, had been promoted to enhance the impact of the Project.

While the Overall Goal was achieved by the terminal evaluation given the status of the relevant indicators, it should be noted that most indicators (on MoUs and patents) were able to be achieved by the MTR alone and therefore the Project could have selected more ambitious or different indicators to measure the long-term outcomes of the Project. There were several positive impacts by the Project such as expanding the network of IITH and Japanese universities further than India and Japan, increased visibility of IITH in Japan and India, increased visibility of and understanding on Japanese universities, industry and culture at IITH, and positive impacts in Japanese universities and industries. No negative impact by the Project was observed by the time of the terminal evaluation.

(5) Sustainability: Moderate

The sustainability of the Project is assessed as moderate. The sustainability of the Project from policy, institutional and organizational aspects is high as the Project is in line with the Indian and Japanese policies (political aspects); A number of MoUs with Japanese universities and industries are signed; The active and well organized Scholarship Students' Association (JFSA) is available (institutional aspects); Turnover rate of IITH faculty members and administrative staff is minimal and the average age of IITH faculty members is young (38 years old) (organizational aspect). On the other hand, the sustainability from financial and technical aspects is moderate. In terms of financial sustainability, although most networks already built by the Project are expected to continue without further financial inputs, some of them are still at a rudimentary stage and need further support at least for a few more years to take advantage of the momentum and entrench their networks. With regard to industry collaboration, promotion of internship and employment in Japan and the network already built are likely to continue without further support, while expanding the network to a wide variety of research fields is less likely to be promoted without further inputs.

3-3. Major supporting factors to achieve the Project Purpose

1) Factors related to planning
   - Student exchange funded by other funding schemes contributed to better educational outcomes at Japanese host universities by the fact that discussion opportunities in English increased and more number of Japanese students were inspired by Indian students with high abilities.

2) Factors related to implementation
   - Long-term or existing relationships between some IITH and Japanese faculty members before the Project or CKP started assisted them in smooth collaboration based on the established trust.
   - JFSA voluntarily provided scholarship grantees with support and information they need and connected them with JICA if necessary. Some interviewees pointed out that this is likely to have contributed to the increase in the number of applications for the scholarship and employment in Japanese companies

[4] Japan Science and Technology Agency
[5] Japan Student Support Organization

and the prevention of dropouts.

3-4. Major Factors that Hampered the Achievement of the Project Purpose

1) Factors related to planning
Nothing in particular.

2) Factors Related to Implementation
Nothing in particular.

3-5. Conclusion

In sum, the Project produced a number of excellent achievements for the past 8 years. The foundation to connect between IITH and Japanese universities and industries was established. By the terminal evaluation, 116 IITH graduates received higher education opportunities and 33 of them already worked in Japanese universities and industries. The establishment of networks between IITH and Japanese universities and industries resulted in the signing of 56 MoUs, 72 joint publications (often at high impact journals), the attainment of research funds including two large scale ones, and the increased number of students who obtained internship and/or employment opportunities at Japanese companies. While research collaboration with industry started, the collaboration is still limited to a certain field however.

In terms of evaluation by the five OECD criteria, the relevance of the Project is high as it is aligned well with Indian and Japanese policies and the needs of IITH and the project approach was also appropriate. Effectiveness of the Project is high as the project purpose was achieved by the time of the terminal evaluation. Efficiency is slightly low as most inputs were well utilized to produce expected outputs. Impact of the Project is high given the achievements of the overall goal and several positive impacts observed by the Project. Sustainability is moderate while the sustainability of the Project in terms of political, institutional and organizational aspects is high, the sustainability of financial and technical aspects is moderate.

3-6. Recommendations

Based on the results of the evaluation above, the Team makes the following recommendations to IITH and JICA/the Project Team for the better achievements of the Project:

1) Continue collaboration to sustain the momentum built by the Project

While the Project laid the groundwork to establish and enhance the networks between IITH and Japanese academic institutions and industry, some of them are still at a rudimentary stage and need further support at least for a few more years to take advantage of the momentum and entrench their networks. Especially research collaboration with industry is still limited. Continuous support for the scholarship grantees is also important for the program to have extended, long-lasting impacts on both Japan and India. Therefore, IITH, JICA and Japanese academic institutions and industries are recommended to continuously support further collaboration among them.

2) Assign human resources to maintain and strengthen the research network

Although the scholarship component will continue until 2024, most activities will end in March 2020 and the contract of a long-term expert at IITH will be expired in September 2020.

IITH already plans to establish a separate unit to handle Japan-related activities and assign dedicated staff for the unit. This is important to continue project-related activities (e.g. advertisement of other scholarship, fellowship, research funding schemes) and maintain the network. Therefore, IITH is recommended to set up the unit before September 2020.

3) Develop a database of faculty members involved in the Project to promote Indo-Japan collaborations

There were voices from both India and Japan recommending to develop a database on faculty members of both sides to further promote collaboration. Therefore, it is recommended for the Project to develop a database of faculty members involved in the Project before the Project ends.

4) Provide supports to the JICA FRIENDSHIP Scholars' Association

The contribution of the association is paramount in terms of preventing dropouts, assisting their job-hunting in Japan, and sustaining the network among them and between IITH and Japanese universities. In order for the scholarship program to have significant and long-lasting impacts on India and Japan, the grantees need to be

supported till, and even after, they obtain a position in academia or industry. Therefore, IITH is strongly recommended to fully support the association and provide necessary inputs. JICA is also recommended to closely work with the association for further collaboration.

3-7. Lessons learned

(1) The regular review of a consortium member
The consortium provides an opportunity for various stakeholders to discuss the Project for better outcomes. Given the scale of the Project, their supports were indispensable to achieve its goal. In that sense, better utilization of this opportunity is important such as the regular review of consortium members to invite stakeholders who are more active and interested in Indo-Japan collaboration to further promote it.

(2) The regular implementation of the JCC and the assignment of a project leader
The needs of counterparts which were repeatedly expressed through the questionnaire survey and interviews indicate that it would be better if there would have been a regular opportunity to directly discuss such needs and challenges of both sides and reflect them into the project design if necessary and possible. In addition, given the scale of the Project and in order to strategically implement the Project and communicate with various stakeholders, it would have been ideal to assign a project leader.

(3) Effectiveness of Joint supervision program
Rather than just providing postgraduate scholarships in Japanese universities, joint supervision of postgraduate students by both sending and hosting universities is highly likely to contribute more to strengthening relationships between the two universities. Exchange of post-graduate and PhD students for brief periods of 3-6 months, including the utilization of other financial resources could have enhanced the effectiveness of the collaboration.