

Summary of the Results of the Evaluation Survey

1. Outline of the Project	
Country : The Republic of Indonesia	Project Title : Project for Development of Internationally Standardized Microbial Resources Center to Promote Life Science and Biotechnology
Issue Sector : Biodiversity conservation	Cooperation Scheme : Science and Technology Research Partnership for Sustainable Development (SATREPS)
Division in Charge : Global environment Department	Total Cost : Approximately 400 Million Japanese Yen
Period of Cooperation : (R/D): 7 April 2011 to 6 April 2016	Partner Country's Implementing Organization : Research Center for Biology, Lembaga Ilmu Pengetahuan Indonesia [LIPI (RCB-LIPI)]
	Implementing Organization : National Institute of Technology and Evaluation (NITE), University of Tokyo, RIKEN
	Supporting Organization :
1-1. Background of the Project	
<p>Currently, research and development such as food production, environmental clean-up and energy securing has been advancing in the world utilizing the capabilities of microorganisms. In addition, development of new process of chemical industry and biological detoxification of biodegradable persistent substance are expected to contribute the reduction of the load on the globe. Under such circumstances, "Culture Collection": Indonesia Culture Collection (InaCC) which has function of collection, preservation and delivery of microbial resources, has been the foundation of utilization of microbial resources in research, education and industry sector. Organization for Economic Cooperation and Development (OECD) issued the guideline of Biological Resources Center (BRC) in 2007. Although many countries plan to establish BRC with international standard for networking, research and development under above trends, there have been no internationally standardized BRC in Indonesia. The biodiversity of Indonesia is well known in the world, though there was a concern that the loss of the rare diversity by destruction of nature. By the Convention on Biological Diversity (CBD), management of biological resources has become a national strategy of Indonesia. It is argent task for Indonesia to establish a mechanism to conserve the rich microbial resources by promoting the collection, preservation and utilization of microbial resources.</p> <p>The Project for Development of Internationally Standardized Microbial Center to Promote Life Science Research and Biotechnology (hereinafter referred to as "the Project") aims at the promotion of life science research and biotechnology for agriculture and industrial sectors. For the purpose, the Project has supported the establishment of BRC and its operation by conducting applied research, database development and capacity building in the concerned area. National Institute of Technology and Evaluation (NITE) as a representative Japanese research institute and RCB-LIPI as a counterpart (C/P) has been implementing the project jointly. Upon at the final stage of the project, the terminal evaluation survey was carried out by Japan International Cooperation Agency (JICA) with cooperation of Japan Science and Technology Agency (JST).</p>	
1-2. Project Overview	
(1) Overall Goal:	
Microbial resources at InaCC are utilized for sustainable economic development of Indonesia and improvement of quality of life globally in compliance with Convention on Biological Diversity (CBD).	
(2) Project Purpose:	
Internationally standardized microbial resource center (InaCC) as a core of Biological Resource Center in Indonesia to promote life science research and biotechnology is established.	
(3) Outputs	
Output 1: Functions of microbial resource center (InaCC) in LIPI are developed, to be a national reference collection and to serve as a center for researches, ex-situ conservation, training and sustainable utilization of microbial resources.	
Output 2: Isolation and identification of new microbial resources originated from Indonesia, which is	

beneficial to human welfare, food production, agriculture, and environmental restoration is conducted.

Output 3: Soil microorganisms that have beneficial effects on agriculture, ecosystem conservation, and environmental restoration are isolated and characterized.

Output 4: Animal gut microbiota are isolated, identified and selected for probiotics.

(4) Input (As of the terminal evaluation)

Japanese Side

- Total budget : Approximately 400 million Japanese Yen

- Japanese Experts

1 long term expert (Project Coordinator) and 32 short term experts have been dispatched.

Output 1:5 / National Institute for Technology Evaluation (NITE), Output 2: 14 / NITE, 1 / Riken, 1 / J Power, Output 3:7 / University of Tokyo (UT), Output 4: 4 / Riken.

As of the end of October, 198 times of visit have been conducted (Total 1,516 days, 50.02 MM)

- Project operational cost: 8,321,948,722 IDR (Approximately 68.3 million Japanese Yen)

- Provided Equipment: Approximately 162.1 million Japanese Yen / 6,064,877,023 IDR

(Approximately 49.8 million JPY) and 941,165 USD (Approximately 112.3 million Japanese Yen) have been spent for the equipment such as Seamless mass spectrometer, Clean bench, Deep Freezer and Computers

- Training in Japan and other countries: The total number of C/P having participated in training in Japan is 69 persons and in other countries is 23 persons.

Indonesian Side

- Counterparts : 67 persons (The Project Director, the Project Manager and 65 C/P personnel)

- Local cost : 40,460,766,100 IDR (Approximately 332.2 million Japanese Yen)

2. Evaluation Team

Members	Designation	Name	Organization
Japanese Side	Leader	Mr. Kei Jinnai	Director, Natural Environment Team 1, Forestry and Nature Conservation Group, Global Environment Department, JICA
	Evaluation Planning	Ms. Satomi Tanaka	Technical Advisor, Natural Environment Team 1, Forestry and Nature Conservation Group, Global Environment Department, JICA
	Evaluation Analysis	Mr. Teppei Okano	Consultant, Icons Inc.
	Observer (JST Research Supervisor)	Dr. Shuichi Asanuma	Professor emeritus, Nagoya University, Research Supervisor, JST
	Observer (JST Research Evaluation)	Mr. Masayuki Sato	Principal Associate Research Supervisor, Department of International Affair (SATREPS Group), JST
Indonesian Side	Dr. Yulin Lestari	Associate Professor, Department of Biology, Faculty and Mathematics and Natural Sciences (FMIPA), Bogor Agricultural University (IPB)	
	Dr. Danang Waluyo	Head, Technology Services Division, Biotech Center, Agency for the Assessment and Application of Technology (BPPT)	
Period of evaluation	26 October 2015~14 November 2015		Type of Evaluation : Terminal Evaluation

3. Results of Evaluation

3-1. Verification of Achievement

(1) Progress of Activities

The activities have been conducted according to Plan of Operations (PO). From the beginning of the Project, in general, the preliminary research has been conducted by the Indonesian researchers and further studies have been carried out by the Japanese experts for enhancement and validation. By the close technical guidance and instruction, necessary skill and knowledge has been effectively transferred to Indonesian members. Currently most of activities related to the Output 2, 3 and 4 are implemented without significant delay. As to the Output 1, although some activities are slightly delayed due to the extension of the construction period of InaCC building and, all the activities are expected to be completed by the end of the Project. As for the additional activities, the research for the

growth of microalgae in the waste water of shrimp pond has been launched (RS-2). The candidates of new taxa of mycorrhizal fungi were discovered through the sample collection and the implementation of further taxonomic research of the species is under consideration (RS-3-B). On the other hand, several activities under RS-3 slightly changed from original plan. Since the inoculation trial implemented with Forestry Research and Development Agency (FORDA) had not derived expected results, the Project continues the experiment with newly developed facility in RCB-LIPI aiming at capacity building of Indonesian researchers (RS-3-B). Also a part of the analysis of functional genes and the accumulation experiment have been abandoned due to the limitation of analytical equipment in Indonesia, however it has not affected to the achievement of outputs (RS-3-A).

(2) Level of the achievement of Outputs

Output 1

Most indicators of the Output 1 have been achieved at the time of terminal evaluation and the remaining indicators are expected to be achieved by the end of the Project. The activities under the Output 1 are mainly related to the operation and management of InaCC. Although the activities has started from the beginning of the Project, there is a slight delay in the implementation of activities from the original timeline because the activities have been transferred to the new building of InaCC from the RCB-LIPI building after completion of its construction in September 2014. Since the commencement of the activities in the new building, the project members have accelerated the process of registration of microbial isolates and so all the activity are expected to be completed by the end of the Project.

Output 2

Almost all of the indicators of the Output 2 have been achieved. The wide range of research activity has been conducted under the Output 2. The research activities were carried out for the purpose to enrich the national collection of InaCC. At this point, totally 4289 strains have been isolated and identified. Nine hundred and ninety seven (997) strains have been registered as the public collection. Members of this research group are currently making effort to compile information to prepare the application forms for the registration for the database. At least 2,000 strains which already registered in the project collection will be deposited to the public collection by the end of the Project to achieve the indicators. As of October 2015, totally 4 papers were published, 3 papers accepted, 5 papers submitted and 13 papers in preparation.

Output 3

Most of the indicators of the Output 3 have been achieved. Although some of the indicators have not yet completely achieved, it is expected to be attained the target goal by the end of the Project. As to research for bacteria, more than 50 strains which have beneficial function for agriculture and ecosystem restoration were isolated. The accumulation experiment on ammonium oxidizing bacteria of Indonesian soils had to be abandoned due to the limitation of facility, though the target of the activity was achieved in satisfactory level as set in the indicators. Regarding research for fungi, 54 strains of mycorrhizal were isolated and identified by the genetic analysis. Through the sample collection of fungi in the forest field survey, the candidates of new taxa of mycorrhizal fungi were discovered. The research group is eager to continue the implementation of further taxonomic research of the species.

Output 4

All indicators of the Output 4 have been achieved. As to animal gut microbiota of chicken, 60 strains are isolated and identified. Nine (9) of them are deposited to public collection and 51 of them are in the process. The taxonomical study for 9 strains of 3 species was conducted by the research group. Two (2) papers were submitted to International Journal of Systematic and Evolutionary Microbiology and 1 of them was accepted. Fifteen (15) candidates of probiotic were selected from 120 strains of lactic acid bacterium isolated from the intestine of chicken. Regarding gut microbiota of cattle, 84 strains were isolated and identified. All of them are in the process to deposit to the public collection. The taxonomical study for 6 strains of 3 species was conducted and several papers are in the preparation. More than 200 strains of lactic acid bacteria were isolated from the animal feed silage in Indonesia. It is found that 8 strains have an antibacterial activity against colon bacillus. Datasets on microbial diversity in intestine of chicken and rumen of cattle were obtained through the analysis by the molecular biological method.

(3) Level of the achievement of Project Purpose

All the indicators are expected to be achieved by the end of the Project. More than 2,000 isolates have already been deposited as the project collection and those isolated are on the way to be deposited into the public collection. At the time of the terminal evaluation, 1,098 isolates have been deposited to the public collection (Indicator a). The procedure for application, authorization and distribution of strains deposition has been arranged (Indicator b). As to database, the data entry is in the process. The database of the microbial resources which already published in the journals is open to the public and available for researches and development (Indicator c) and d). Regarding compliance of the management system to ISO9001:2008, internal and external audits were conducted in December 2014 and no major violation against the quality management procedure was found (Indicator e). Although the Project Purpose is expected to be achieved by the indicators set in the Project Design Matrix (PDM), it is necessary to keep in mind that the InaCC's role as "internationally standardized microbial resource center". InaCC is required to continue the operation securing accuracy and reliability under the procedure prepared by the Project and make effort to raise the degree of recognition of the center by national and international partners.

(4) Level of the achievement of Overall Goal

The indicators of the Overall Goal are expected to be achieved in 3 to 5 years after the completion of the Project by the effort of Indonesian partners. The basic techniques technology of isolation and handling of useful microbial resources have been transferred to Indonesian side through the collaborative research between by Indonesian and Japanese researchers under the Project. The Indonesian researchers have been acquired adequate skill and knowledge to conduct the application studies towards creation of social benefit in the country. Also the microorganisms which isolated and identified by the Project are expected to have high potential to be utilized for agriculture, environment conservation, fishery and many other industries. Therefore, it is important to promote the collaborative work with national and international partners after completion of the Project to create the social profits.

3-2. Summary of Evaluation Results

(1) Relevance (High)

The establishment of national biological resource center was the important intervention area in the Indonesian Biodiversity Strategy and Action Plan (IBSAP 2003- 2020) which was developed by BAPPENAS. Also the Indonesian government recognized the importance of conservation of biodiversity in the National Long-Term Development Plan (RPJPN 2005-2025). The Project aims to promote life science research and biotechnology in Indonesia for sustainable economic development of Indonesia and improvement of quality of life globally in compliance with CBD. InaCC has been appointed to play roles on preserving the identified and characterized microbes that benefit for human welfare, technological transfer and dissemination in the National Medium-Term Development Plan 2015-2019 Book II (RPJMN 2015-2019 Buku II). The Project has assisted InaCC to serve their function. Thus, the approach of the Project is deemed as appropriate. Also the Project is consistent with Japanese aid policy and JICA's assistance policy for Indonesia

(2) Effectiveness (Moderate)

The Indicator e) of the Project Purpose has been achieved at this time and it is found that the other Indicators a), b) and c) are achievable by the end of the Project. The remained Indicator d) is to measure the situation of database preparation and utilization. The database has been established and its online catalogue has been opened to the public. InaCC has distributed strains in the public collection to the external users on their requests, though neither the database nor the online catalogue was utilized in the process. As the system and procedure of the distribution have been set up already, the actual utilization of the database and the online catalogue is expected to fulfil the indicator. There is high possibility to achieve most of the indicators of the Project Purpose by the end of the Project, though InaCC is required to continue its operation in proper manner prescribed in the operation manual and Standardized Operational Procedures (SOP produced and prepared by the Project. To upgrade the capacity of InaCC and to enhance the function as an internationally standardized microbial resource center, continued effort to improve its accuracy and reliability would be essential through their operation of the culture collection.

(3) Efficiency (Relatively High)

The quality, volume and timing of the Project inputs by Japanese side and Indonesian side were adequate and led to achievement of outputs. For the achievement of outputs, Japanese experts have been dispatched properly and committed to the project activities with high degree of expertise. Even though Japanese experts visited Indonesia with limited frequency, once a year or few times, the Project members communicated by e-mail before their visit and made the short stay effective and meaningful. Equipment has been procured according to the necessity of each research subject. These equipment were procured and installed in InaCC building or University of Gadjah Mada (UGM). All the equipment was properly managed by Indonesian side. Training in Japan and other countries were provided to enhance the skill and knowledge of Indonesian members. As of October 2015, totally 92 persons participated to the training and contribute to the attainment of the each output (In Japan: 69 persons, In other countries: 23persons). All these inputs have been effectively transferred into the outputs. As to the input by Indonesian side, there was lack of budget for travel expenses for the researchers to conduct field research in the begging of the Project. However, the budget allocation has been improved and no major problem is found in input by Indonesian side such as budget allocation, human resources and facilities at this time. Especially the budget allocation for InaCC building and actual construction contributed greatly to the achievement of each output.

(4) Impact (Relatively High)

The Project established a foundation of microbial resource center and transferred technology of isolation and handling of useful microbial resources to Indonesian side. The indicators of the Overall Goal are expected to be achieved in 3 to 5 years after the completion of the Project by the effort of Indonesian partners. The microorganisms isolated and identified by the Project are expected to have high potential to be utilized for agriculture, environment conservation, fishery and many other industries and expected to create the social profits. On the other hand, a remarkable impact of the Project is the awareness raising for values of the microbial resources by Indonesian side. The Indonesian government has recognized the necessity of microbial resource center to promote the utilization of microbial resources for sustainable economic development and improvement of quality of life in Indonesia. For this reason, InaCC building with adequate equipment was constructed by Indonesian government. The Project largely contributed the process of the establishment of the center. It is considered as one of the significant achievement of the Project.

(5) Sustainability (Moderate)

Political Aspect: Indonesian government recognized the importance of conservation of biodiversity and utilization of microbial resources for sustainable development. Also sustainable operation of the microbial resource center is put high priority. Thus, the related policy is expected to be continued and there is no constraining factor securing sustainability from political aspect.

Financial Aspect: Indonesian government secured 125,458,861,000 IDR for the overall budget for RCB-LIPI in 2015, of which 860 million IDR was allocated for InaCC. The budget is the minimum for the operation and maintenance cost of the national depository. Since InaCC has function to conduct research activities, depositing microbial resources, training, public awareness, and scientific services, therefore, InaCC should seek more budgets to enhance its functions as national microbial genetic resources center.

Organizational Aspect: InaCC obtained ISO 9001:2008 through RCB-LIPI. The documentations for the application of ISO 9001:2008 were designed for managing the institution in systematic manner and these documentations help to secure the sustainability from organizational aspect. Also to enhance organizational capacity, RCB-LIPI recruited 6 new graduates as the permanent research staff of InaCC in 2014 and appointed 2 permanent technical staffs to help the works on preparation and preservation of microorganism. The reinforcement of the staff system is a positive factor to secure the sustainability from organizational aspect. On the other hand, it was observed the issue on the procurement of the high quality consumables in proper timing due to the absence of suppliers in Indonesia.

Technical Aspect: Most of Indonesian members have been involved in the Project activities since the beginning and accumulated the technology and knowledge including method for the experiment, handling of the microorganisms and preparation of the papers transferred by Japanese experts. Research Center of Biology (RCB) already has general training program to maintain and upgrade the capacity of human resources, not specialized for InaCC.

Research Aspect: The researchers obtain regular research budget from integrated research program. In addition, the budget for the research can also be obtained by several competitive funds and cooperation with national/international partners to secure the opportunity to conduct their researches according to their necessity.

3-3. Contributing Factors

(1) Good communication and coordination among the Project members

Japanese experts established a good relationship with counterpart researchers and that contributed to the smooth implementation of the Project activities and effective technology transfers. Counterparts were encouraged to participate collaborative researches and accumulate knowledge and skills throughout the implementation of activities. In addition to the communication among the researches in the each research subject, the Project assigned a project coordinator as a long-term expert. Since a large number of Japanese experts, researchers and technicians have been involved in the Project (total 18 persons from Japanese side and 65 persons from Indonesian side), the coordination and arrangement by the project coordinator greatly contributed to the smooth implementation of the Project activities.

(2) Construction of InaCC building

There is a huge impact of the construction of InaCC building. The visit of the policy makers of BAPPENAS and LIPI to Japan in 2012 promoted the understanding of the necessity and importance of the biological resources center among the Indonesian decision makers. The construction of InaCC building was completed and inaugurated in September 2014. The building has enough space to install adequate facility and necessary equipment. The construction of InaCC building contributed to the effective implementation of the activities under the Project and at the same time, the ownership and motivation of Indonesian project members are increased.

(3) Long term involvement of the Indonesian researchers

Many Indonesian researchers have been involved in the Project activities from the beginning of the Project and they did experience the collaborative research with Japanese expert. Since the knowledge and skills have been accumulated in the each Indonesian member, their continued involvement secured the effectiveness of the Project and prevented the loss of the experience in InaCC, resulting in building a solid human resource base for InaCC.

3-4. Constraining Factors

(1) Turnover of the personnel

Several members left from the Project for the study in abroad, the project manager and project director were changed twice, respectively, during the Project period. It required time for the newly appointed leaders to understand the contents of the Project and operation procedure set up by the Project. The frequent turnover in the management position has constrained the leadership of Indonesian side and management of the Project.

3-5. Conclusion

From the perspective of the five evaluation criteria, the relevance of the Project is assessed as High since the conservation of biodiversity and utilization of microbial resources are one of the high priorities areas for the Indonesian government and the Project's target is in line with the national development plan. The effectiveness of the Project is deemed as Relatively High. The Project Purpose is expected to be achieved all in all by the end of the Project. The efficiency of the Project is assessed as High. Most inputs that are necessary for the implementation of activities have been allocated as planned and the timing, quality and volume of input were appropriate both by Indonesian side and Japanese side. The Project's impact is deemed as High since there is possibility to achieve the Overall Goal by the continued effort by the Indonesian side. Also the external conditions have to be fulfilled. The Sustainability of the Project is assessed as Relatively High. The political, technical and financial sustainability is expected to be secured. On the other hand, organizational sustainability remains some minor issues.

3-6. Recommendations

3-6-1 Recommendation for the Project (Both Japanese side and Indonesian side)

(1) Achievement of the indicators of the Project Purpose

The Project shall achieve the indicators of the Project Purpose that have not yet accomplished at the time of terminal evaluation by the end of the Project. Although the number of the strains deposited in the project collection is around 5,000, only 1,098 strains of them have been registered to the public collection at the time of terminal evaluation. The Project shall accelerate the registration to the public collection from the project collection to fulfil the indicator, at least 2,000 strains before the completion of the Project.

(2) Verification of InaCC's function in response to the third party's request for the public collection through distribution practice

Internationally standardized microbial resource centers are obliged to distribute their collection to the third parties. To verify this function of InaCC, the Project is recommended to conduct the distribution practice of strains of the public collection in response to the request from the SATREPS Project for Innovative Bio-Production in Indonesia: Integrated Bio-Refinery Strategy to Promote Biomass Utilization using Super-microbes for Fuels and Chemicals Production by the end of the Project.

(3) Enhancement of the distribution systems of the public collection

The Project is necessary to prepare various strain distribution systems such as lyophilized ampules in certified quality. In addition, it is necessary to secure human resources for maintenance of the public collection and experienced and skillful technicians to assist curators. At the same time, it is necessary to conduct the further capacity building of the curators and technicians.

(4) Adjustment of InaCC operation manual

The present InaCC operation manual was prepared in Indonesian language in November 2013. The Project shall adjust the present InaCC operation manual for the new work flow at the InaCC building by the end of the Project. In addition, it is advisable to prepare an English document that is required by global users to understand the InaCC's operation according to the internationally standardized quality and services.

(5) Establishment of "Research and Development Collection" and its utilization

The isolates of the Project were stored as the project collection, some portion of them were registered into the public collection after authentication, but reasonable numbers of isolates have been remained in the project collection. Although RCB-LIPI and NITE Biological Resource Center (NBRC), NITE have agreed on the close of the project collection at the end of the Project, the Project shall consider to utilize those remained project collection for further use.

(6) Development of Post Project Management Plan for InaCC

The Project shall develop the Post Project Management Plan for InaCC by the end of the Project to sustain the InaCC after the termination of the Project considering following six points;

- 1) To work as the national deposit organization assigned in the strategic plan of LIPI and RPJMN.
- 2) To develop the annual budget plan to sustain InaCC's activities.
- 3) To develop the five years plan for recruitment of staff such as researchers, technicians, etc. for securing necessary human resources.
- 4) To develop the capacity of staff such as curators, researchers, technicians, etc.
- 5) To maintain the facility and equipment properly.
- 6) To enhance the function of InaCC as a National culture depository in supporting national/international scientific activities.

(7) Promotion of the Project outcomes for sustainable economic development

The Project shall promote the use of the Project outcomes for potential users through the public relation such as seminar, workshop, website, online catalogue etc.

Each research outcomes are expected to have high potentials for sustainable economic development such as agriculture, environment conservation, fishery etc. For instance, in this Project, microalgae were tested for waste water treatment of shrimp ponds aiming at the future production of

various substances. Mycorrhiza is useful for restoration of Dipterocarp forest. Probiotics could be used by poultry industry for the replacement of antibiotics. Thus, the isolates of the Project are expected to be used for sustainable economic development in future.

The Project is also expected to collaborate with other SATREPS projects such as Bio-Refinery Project for distribution of strains from the public collection.

3-6-2 Recommendation for InaCC, RCB-LIPI

(1) Preparation and utilization of laboratory manual

The experiment procedures such as handling techniques of microorganisms, reagents volume measurement, L-drying ampule preparation of microorganisms and other laboratory techniques are needed to be compiled in the SOP based on the ISO9001:2008 for quality assurance and continuation of work of RCB-LIPI and InaCC.

(2) Appointment of person-in-charge of operation and maintenance for the equipment

InaCC has been equipped with instruments for specified analysis purposes. InaCC should assign person-in-charge for operation and maintenance of such equipment in proper manner.

(3) Renewal of ISO9001:2008 in 2017

The certification of ISO9001:2008 was obtained in 5th February 2014. RCB-LIPI is necessary to carry out their daily activities in compliance with ISO9001:2008 with necessary improvement to the change in work environment caused by the transfer of InaCC activities from Botany-Microbiology building to new InaCC building in September 2014 to fulfil the next renewal of certification in 2017.

(4) Obtainment of ISO17025 for certification as internationally standardized laboratory

RCB-LIPI is making an effort to obtain ISO17025 for quality control of analysis and laboratory work (experimentation). RCB-LIPI is expected to obtain ISO17025 at early stage for higher recognition as internationally standardized microbial resource center. InaCC shall take measure to manage its resources, so both research and service activities can be conducted effectively.

3-6-3 Recommendation for LIPI

• Policy making for Access and Benefit-sharing (ABS) of Nagoya Protocol

LIPI, Scientific Authority of ABS for Indonesia, is expected to act in collaboration with the Indonesian focal point for the acceleration of making policy regarding ABS of Nagoya Protocol. The bio-resources of Indonesia are widely recognized to be a valuable asset for the sustainable economic development of Indonesia and improvement of quality of life globally.

3-7 Lessons learned

(1) Great efforts of the Project members for construction of InaCC

Deputy of BAPPENAS, Chairman, Deputy Chairman for Life Sciences and Principal Secretary of LIPI visited NBRC to observe the advanced BRC in Japan and they clearly recognized the importance of the microbial resource center in Indonesia. The Japanese experts and RCB-LIPI researchers took a great effort to convince them and coordinate their visit to Japan. As the results of their visit, budgets for construction of InaCC had been secured and InaCC was set up finally. Thus, the Project members' great effort led to the realization of the construction of InaCC.

3-8 Follow up

None