

Summary of Evaluation Results

1. Outline of the Project	
Country: The Republic of Indonesia	The Project for Standardization and Quality Control for Horticulture Products of Indonesia (Improvement of Thermal Treatment against Fruit Flies on Fresh Mango)
Sector: Agriculture and Rural Development	Cooperation Scheme: Technical Cooperation Project
Division in charge: Rural Development Department,	Total Cost (at the time of evaluation): Approximately, 2.9 million yen.
Period of Cooperation(R/D): October 16, 2009-April 15, 2013 (3.5 years)	<ul style="list-style-type: none"> •Partner Country's Implementation Organization: Directorate General of Horticulture (DGH), Ministry of Agriculture (MOA) •Agency for Agricultural Quarantine (AAQ), Ministry of Agriculture (MOA) •Pest Forecast Institute (PFI), Directorate of Food Crops, Ministry of Agriculture (MOA)
	Supporting Organization in Japan: Ministry of Agriculture, Forestry and Fisheries
1-1 Background of the Project	
<p>Despite the great potential of Mango as one of the major fruits for export from Indonesia, less than 0.1 percent of its total production (2.1 million tons) was actually exported in 2011. Although an increasing amount of mangoes has been exported from Indonesia to markets in the Middle East and East Asian countries, due to the existence of various types of fruit flies attacking mangoes produced in Indonesia, they can access only to the countries that do not impose any quarantine requirements on the fruit infested with those flies.</p> <p>In order to address the issue and thereby further increase export of mangoes to overseas markets including Japan, the Government of the Republic of Indonesia requested the Government of Japan to provide assistance in terms of disinfestation techniques by vapor heat treatment (VHT) against fruit flies on fresh mango.</p> <p>As a result, since October 2009, the Government of Indonesia has been implementing the Project for Standardization and Quality Control for Horticulture Products of Indonesia (Improvement of Thermal Treatment against Fruit Flies on Fresh Mango) (hereinafter referred to "the Project") in cooperation with Japan International Cooperation Agency (JICA) for expected cooperation period of 3.5 years.</p>	
1-2 Project Overview	
<p>This Project aims to establish the disinfestation techniques against fruit flies on fresh mango by strengthening capacity of counterparts on rearing test fruit flies in laboratory, disinfestation techniques by vapor heat treatment (VHT) and building data system which stores examination data and analysis results.</p>	

<p>(1) Overall Goal; The disinfestation techniques by VHT against fruit flies on other tropical fruits are established.</p> <p>(2) Project Purpose: The disinfestation technique by VHT against fruit flies on fresh mango, Gedong variety, is established.</p> <p>(3) Output:</p> <p>Output 1: The capacity of counterparts to rear test fruit flies successively in laboratory is improved.</p> <p>Output 2: The capacity of counterparts to disinfest test fruit flies by VHT is improved.</p> <p>Output 3: The data system which stores examination data and analysis results is established.</p>	
<p>(4) Inputs (at the time of review (2012.12))</p> <p>Japanese Side: Total amount 2.9 million yen</p> <p>Dispatch of Long-term Experts:2 Short-term Experts:12</p> <p>Provision of Equipment : Approximately 117.4 million yen.</p> <p>Local Cost: Approximately 35.5 million yen (including the planned budget of 2012)</p> <p>Indonesian Side</p> <p>Allocation of CPs : 15</p> <p>Office space for the Japanese experts in PFI; utilization of facilities in PFI, land for new VHT laboratory building, etc.</p> <p>Salaries of CPs, utilities (water, electricity and telephone charges), purchase of test mangoes, meeting arrangement, etc. were born by the Indonesia side.</p>	
<p>2. Final Evaluation Team</p>	
<p>Members of the Joint Evaluation Team</p>	<p>(1) Mr. Koji SUMIDA (Leader), Senior Advisor to the Director General, Rural Development Department, Japan International Cooperation Agency</p> <p>(2) Mr. Manabu SUZUKI (Plant Quarantine Administration), Deputy Director, Plant Protection Division, Food Safety and Consumer Affairs Bureau, MAFF, Japan</p> <p>(3) Mr. Nobuyuki SHIBATA (Plant Quarantine Techniques), Section Chief, Plant Protection Division, Food Safety and Consumer Affairs Bureau, MAFF, Japan</p> <p>(4) Mr. Makoto YAMANE (Planning and Management), Advisor, Paddy Field Based Farming Area Division I, Rural Development Group I, Rural Development Department, Japan International Cooperation Agency</p> <p>(1) Ms. Anastasia Promosiana (Leader), Head of the Evaluation and Reporting Division, DGH, MOA</p> <p>(2) Mr. Turhadi Noerachman (Member), Head of Sub-directorate for Export and Non Seedling Area, Center of Quarantine for Plant and Vegetable Security</p> <p>(3) Ms. Rasmi (Member) Planning Bureau, Monitoring and Evaluation Division, MOA</p> <p>(4) Ms. Priliani Setiyaningsih (Member) Division Staff, Sub-directorate for Asia and Pacific, Center for International Cooperation</p> <p>(5) Mr. Deni Satriaman(Member) Division Staff, Evaluation and Reporting, DGH, MOA</p> <p>(6) Ms. Sindha Cahya Wardhani (Member) Division Staff, Planning, DGH, MOA</p>

	(5) Dr. Hideaki HIGASHINO (Evaluation Analysis), Senior Consultant, RECS International Inc.	
Period of Review	November 29 to December 19, 2012	Type of Evaluation: Final Evaluation

3. Results of Review

3-1 Project Performances

(1) Achievement of Project Purpose: Achieved.

Project Purpose: [The disinfestation technique by VHT against fruit flies on fresh mango, Gedong variety, is established.]

Indicator: The VHT standard for complete disinfestation of test fruit flies without critical damage to test fruits is established for the most heat tolerant stage among all the target species in large-scale mortality tests of more than 30,000 flies.

Large-scale mortality tests were conducted in November and December 2012 for the most heat tolerant stage among all the target species (matured eggs of *B. papayae*). As a result, more than 30,000 flies were disinfested with mortality rate 100% as summarized in the table below.

Status of Achievements

No.	Date	Load factor	Control		Treatment at 47.0°C for 30min			
			No. of fruit	No. of survivor	No. of fruit	No. of estimated insect	No. of survivor	Mortality (%)
1.	Nov.22, 2012	Half-Load	30	3,332	75	8,330	0	100
2.	Nov.23, 2012	Half-Load	30	3,545	75	8,862	0	100
3.	Nov.30, 2012	Full-Load	30	3,633	100	12,110	0	100
4.	Dec.7, 2012	Full-Load	30	3,422	100	11,406	0	100
Total			120	13,932	350	40,708	0	100

(2) Achievement of Output2) Summary of Outputs Achievements

Output 1: The capacity of counterparts to rear test fruit flies successively in laboratory is improved. : Achieved.

Indicator 1-1: Counterparts can collect eggs of fruit flies with the eggging device effectively.

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After introduction of Biotron in March 2010 and improvement of eggging devices, CPs became able to collect eggs of rearing three species (*B. carambolae*, *B. papayae*, and *B. cucurbitae*) as scheduled.

Indicator 1-2: Counterparts can rear the larvae artificially in each species according to the examination schedule.

CPs became able to rear larvae of each species according to the examination schedule, by modification of ingredients of artificial diet and standardization of size of rearing cage.

Indicator 1-3: Counterparts can rear about 6,000 adult flies successively in each species in laboratory.

In addition to the introduction of Biotron, countermeasures such as standardization of size of rearing cage, preparation of rearing schedule, improvement of adult fly bait and change of the way of supplying bait and water for adult flies, were made. As a result, CPs became able to rear more than 6,000 adult flies of each species successively in laboratory.

Output 2: The capacity of counterparts to disinfest test fruit flies by VHT is improved. : Achieved.

Indicator 2-1: Counterparts can operate the VHT equipment properly.

In March 2010, VHT equipment was installed at PFI and the Project started to operate the equipment for various testing. Since then, CPs have been learning the operation, and the CP in charge are able to operate VHT independently at both the fixed and program modes for mortality test. Sometimes CPs operate VHT to conduct tests on their own decision. In the first half of the Project, delay of installation of VHT equipment at the project site, and electrical power supply troubles associated with generator, water bath, and so forth, prevented smooth implementation of the project activities. It is necessary for CPs to be able to contact VHT manufacturer, Sanshu Sangyo Co., Ltd in Japan for the machine maintenance and minor repair work by themselves before the end of the cooperation period.

Indicator 2-2: Counterpart can determine the most tolerant species among all the target species.

In order to accelerate the progress of the activities to decide the most tolerant species, 2 short-term experts were dispatched from March 2012 to July 2012. With the assistance of the experts, CPs conducted a series of hot water dipping test and determined *B. papayae* as the most heat tolerant species among three fruit flies.

Indicator 2-3: Counterparts can determine the conditions of complete disinfestations for the most heat tolerant stage among all the target species.

Due to the delay of the activities to conditions of complete disinfestation for the most heat tolerant stage among the target species, 2 short-term Japanese experts dispatched from March 2012 to July 2012 assisted CPs to conduct susceptibility test and the matured eggs was determined as the most heat tolerant stage of the *B. papayae*. Based on the result, CPs conducted several small-scale tests to determine the conditions of complete disinfestations in October 2012, and the conditions (temperature of the center of the fruit: 47 °C,

holding time: 30 minutes, etc.) were decided.

Indicator 2-4: Counterparts can avoid heat injury by appropriate methods of VHT.

At the time of the Terminal Evaluation, CPs conducted the result of heat injury tests as conducted with various conditions, and will determine the appropriate conditions to avoid heat injury through those tests and observations.

Output 3: The data system which stores examination data and analysis results is established. :To be achieved by an end of the Project.

Indicator3-1: All the data including fruit fly rearing and disinfestation tests are stored.

The data including fruit fly rearing and disinfestation tests has been collected on each occasion and under accumulation.

Indicator3-2: Manuals for each process are prepared.

Fruit fly rearing manual and VHT operation manual were compiled in November 2012. Other manuals are also under preparation with Japanese experts' assistance.

Indicator3-3: Analyzed data is compiled into a report.

Tests data such as dipping tests, susceptibility tests, and small-scale mortality tests are being compiled by CPs. In addition to these, large-scale test data will also be compiled into a report with assistance of the Japanese short-term expert dispatched in December 2012 and to stay in Indonesia until March 2013.

3-2 Summary of Evaluation Results

(1) Relevance : High

The direction of the Project is in line with the national priorities of GOI. The Project has been consistent with the Indonesian policies, as there has not been any major change in National Strategy and Medium-Term Development Plan (2010-2014) in the field of horticulture, plant quarantine as well as Japanese cooperation policy. All the related agencies, DGH, AAQ and PFI, as the implementing organization of the Project, play important roles in Indonesia to produce good quality of horticultural crops, carry out plant quarantine and conduct pest control, and, thus, need to promote their staff's capacity building. The Team confirmed that all the CPs highly appreciate and are satisfied with the Project activities. Thus, the Project is evaluated as an appropriate response to the needs of the beneficiaries.

(2) Effectiveness : High

This Project aims to establish the disinfestation techniques by VHT and logical framework between each Output and Project Purpose is confirmed. The Project activities have been accelerated in the latter half of the Project, and at the time of the Terminal Evaluation, the Project Purpose have been achieved according to the indicator, as more than 30,000 flies, in total, were disinfested in large-scale mortality tests conducted in November and December 2012, without serious damage to test mangos.

(3) Efficiency : Moderate-High

In general, Input from the Japanese and Indonesian sides was appropriate in terms of quantity and quality, but not so in terms of timing. Especially Japanese short-term experts were repeatedly dispatched in a timely manner Mango harvesting season, so that necessary techniques were transferred in an intense and stepwise manner. In the first half of the Project, the Indonesian side assigned only 10 CPs to the Project despite that R/D stipulates that 17 CPs will be assigned in the Project site and at the secretariat, which hampered the progress of the Project. However, it should be noted that the Indonesian side made a possible effort to increase the number to 15 in the latter half of the Project, including CPs from AAQ and DGH, assigned on a part-time basis.

(4) Impact: Positive

Application of VHT techniques was a totally new challenge to the Indonesian Government. It is possible to apply the technique against fruit flies to other fruits in addition to other varieties of mango. Once the VHT standard for complete disinfestation of test fruit flies is established, many fruit traders will be interested in adopting the techniques as improvement of access to international market is highly expected. There will be economic impacts when export of mango, as well as other tropical fruits, is realized in the future utilizing VHT disinfestation techniques.

As far as technical aspects are concerned, there will be good prospect of Overall Goal achievement as Indonesian CPs are considered to have reasonably, if not completely, acquired the VHT disinfestation techniques on fresh mango. On the other hand, the challenge toward the achievement of overall goal is decision making and administrative procedure of the Government. It is necessary to take series of steps before applying the acquired techniques and knowledge and skills of CPs. As these initial steps are inevitably time-consuming due to rigid examination, whether Overall Goal will be achieved or not within the designated time frame will depend on when and how the Indonesian side will start and manage the procedure.

(5) Sustainability : Moderate

The evaluation team considered that the Indonesian CPs in laboratory will be able to develop their capacity to a necessary extent, since they have acquired gradually the technical capacity which enables them to utilize basic techniques and skills on rearing test fruit flies, conducting disinfestation tests, and operation and maintenance of VHT equipment. Since quality control of horticultural products as well as pest control and plant quarantine are given high priority in the current national policy of Indonesia, as a part of the efforts for export promotion of agricultural products, the policy support for the Project would be continuously secured by GOI for the coming years. However, coordination among PFI, DGH and AAQ at central level still needs improvement as it is still uncertain which entity will take responsibility to continue the Project activities after the completion of the Project, casting uncertainty to the sustainability of the Project. The Team confirmed that the GOI had been providing supports to the Project for operational cost. For the year 2013, approved budget amount for the implementation of the Project activities is IDR 522 million, although requested budget plan by DGH was IDR 900 million. DGH are ready to increase the

budget for the Project as necessity, such as procurement of spare parts of VHT, arises.

3-3 Factors promoting the production of effects

(1) Factors pertaining to planning

No particular factors pertaining to planning were recognized.

(2) Factors pertaining to the implementation process

(2)-1 Dispatch of the Same Persons as Short-term Experts

Japanese short-term experts were dispatched on a shuttle basis without replacement of the members; which contributed to promote smooth implementation of the Project activities and efficient technology transfer, and also to develop good relationship with the Indonesian CPs.

(2)-2 Operational Cost secured by the Indonesian Side

The Indonesian side has made an effort to secure operational cost based on the R/D agreement, such as cost for purchasing test mangos, charge of electricity and water in the laboratory.

3-4 Factors inhibiting the production of effects

(1) Factors pertaining to planning

No particular factors pertaining to planning were recognized.

(2) Factors pertaining to the implementation process

(2)-1 Quality and Quantity of Test Mango

In the former half of the Project, purchased test mangos were not with appropriate size (250-300g) or quality; some of them were infested by fruit flies and showed nutrition disorder symptoms in pulp. Although the Team confirmed that the situation improved in the latter half of the Project, inappropriate test mangoes purchased hampered the disinfestation tests in terms of data accuracy, consistency with the export quality standard, etc., in the former half of the Project.

(2)-2 Delay in installation and Trouble of Equipment

Similarly in the former half of the Project, delay of installation of VHT equipment at the Project site, and electrical power supply troubles associated with generator, water bath, and so forth, prevented smooth implementation of the project activities. Although most of the issues have been solved up to now, there still remain issues, such as warning indication of a water deionizer cartridge. It is necessary to pay attention continuously to the proper maintenance of the equipment.

(2)-3 Insufficient Coordination in Indonesia Side

Due to insufficient coordination amongst the implementing agencies in the first half of the Project period, the progress of the Project activities was inhibited.

3-5 Conclusion

The Terminal Evaluation Team evaluated the Project based on the findings obtained from field observations, a series of discussions with those involved in the Project, and in accordance with the 5 evaluation criteria. Relevance, Effectiveness and Efficiency were evaluated high with a satisfying level, as well as positive Impact could be confirmed. However, some challenges are still remained with regard to the smooth collaboration among government organizations in central level. As a result, the Terminal Evaluation Team concludes that the Project Purpose is prospected to be achieved and the Project should be successfully terminated in April 2013 as originally scheduled in R/D.

3-6 Recommendations

3-6-1 Measures to be take immediately

(1) Recommendation to the Project

(1)-1 Maintenance of the Equipment Management System

The Project is recommended to compile the necessary information to contact the manufacturer and maintenance equipment in Japan by the end of the Project so that CPs can inquire or order the replacement parts and maintenance of equipment by themselves without difficulty.

(1)-2 Response to the Recommendations by the Mid-Term Review

The Project is requested to correspond properly by the end of the Project to the 2 recommendations, namely, "Search for Appropriate Artificial Feed for the Project" and "Issuance of Certificate of Engagement", recommended at Mid-Term review.

(2) Recommendation to the Indonesian Side

(2)-1 Revised Structure of Project Management Unit (PMU)

Organizational structure of PMU, which consists of DGH, AAQ and PFI, has been under review in response to the recommendation by the Mid-Term Review. PMU is recommended to be complete with the organization chart that clearly stipulates the roles and responsibilities of all parties concerned in the Project by the end of the cooperation period to ensure the sustainability of the Project as well as the smooth implementation of testing activities. It is also necessary to set up a periodical meeting in order to verify if these roles are being performed properly.

The Indonesian Government needs to constitute a Ministry Decree as legal grounds for the PMU structure.

(2)-2 Establishment of a "Report Making" Team

The activity of "Report Making" (compiling test data into a report) is scheduled from December 2012 until March 2013. As this activity is the grand sum of all the Project activities, all the stakeholders are required to participate and fulfill their responsibilities. PMU is strongly recommended to establish a "Report Making" team immediately. Several core members should have a periodical meeting such as once in every two-week basis with the appointment of responsible persons who are in charge of the Report Making Team in order to grasp the progress of the team activities.

(2)-3 Establishment of VHT Disinfestation Techniques to Tropical Fruits other than Gedong Mango

In order to establish VHT disinfestation techniques to other tropical fruit as Overall Goal, DGH is required to specify the target fruits as well as to create an action plan including future budget arrangement for maintenance of VHT equipment, in close consultation with PFI and AAQ as soon as possible.

(2)-4 Steady Progress of Quarantine Procedures

AAQ, as National Plant Protection Organization (NPPO) of Indonesia, is recommended to promote the quarantine consultation necessary to lift a ban with NPPOs of importing countries as well as to share updated information with the relevant organizations.

3-6-2 Measures to be taken for the Post Project

(1) Recommendations to the Indonesian Side

(1)-1 Quality and Food Safety Control of Mango for the Future Export

Preparing for lifting a ban on exporting mango in the future, DGH is recommended to make production guidance for high-quality mango without nutrition disorder. DGH is also advised, working with the relevant departments, to establish production systems that will meet the requirements and standards of chemical residues to the provisions of the export destination.

(1)-2 Securing the Technical Level of CPs

DGH, AAQ and PFI are recommended to conduct the activities such as training program or technology study among CPs under the leadership of the “Chief CP”, so that they can maintain the technical level of VHT Operation or skills for the various tests that have been transferred from Japanese experts to the Indonesian CPs through the Project implementation.

(1)-3 Guidance to Exporters for Disinfestation

DGH, AAQ and PFI are recommended to cooperate in the preparation of administrative and technical guidelines so that commercial disinfestation can be properly carried out in response to inquiries from exporters.

3-7 Lessons Learned

Implementation Set-up with Clear Demarcation of Responsibility and Authority

In order to implement a project that is conducted involving plural organizations, it is crucial to establish implementing set-up of counterpart organizations with clear demarcation of responsibility and authority, so that a project can be implemented smoothly by making decision in a timely manner.