

Country Name	National Agricultural Experiment Stations Rehabilitation Project
Islamic Republic of Afghanistan	

I. Project Outline

Background	<p>In Afghanistan, during over 20 years of the conflict, agricultural facilities were destroyed, and rural communities were left impoverished. Three stations of Central Agricultural Experiment Station (CAES)* in Kabul which had once played the important roles were no longer properly functioning due to destruction of facilities and outflow of human resources. For the sustainable development of agriculture in Afghanistan where 80% of the population engaged in farming at the time of ex-ante evaluation, it was imperative to strengthen the research and technology development capabilities through rehabilitation of facilities, capacity building and establishment of an information management system.</p> <p>* CAES consists of Darulaman Station, Badam Bagh Station and Qargha Station in Kabul City.</p>												
Objectives of the Project	<p>Through rehabilitating facilities/equipment and establishing the information management system, improving the individual capacity and building the network in terms of agricultural research and technology development, the project aimed at strengthening the research and technology development of the Research Department* and CAES under the Ministry of Agriculture, Irrigation and Livestock (MAIL), and thereby these organizations would play a central role for improvement of agricultural production and rural livelihood in collaboration with extension departments in the priority areas.</p> <ol style="list-style-type: none"> Overall Goal: Research Department* and CAES are able to play a central role for improvement of agricultural production and rural livelihood through its activities unifying research and technology development in collaboration with extension departments in the priority areas. Project Purpose: The research and technology development of Research Department and CAES are strengthened. <p>* Research Department of MAIL is currently known as Agricultural Research Institute of Afghanistan (ARIA)</p>												
Activities of the Project	<ol style="list-style-type: none"> Project Site: Whole part of Afghanistan (Kabul, Kandahar and Bamian as priority areas) Main Activities: <ul style="list-style-type: none"> (1) Formulate a mid-term strategy and a short-term master plan, rehabilitate facilities and equipment of CAES and build the information management system, (2) Improve dissemination capacity of research officers to stakeholders through carrying out experiments for technology development, (3) Establish an advisory committee to assist ARIA to conduct joint research activities with domestic extension departments and international research centers. Inputs (to carry out above activities) <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Japanese side:</td> <td style="width: 50%;">Afghanistan side:</td> </tr> <tr> <td>1) Experts: 8 persons (Japanese long-term), 17 persons (Japanese short-term) and 2 persons (short-term from the third country)</td> <td>1) Staff allocated: 38 persons</td> </tr> <tr> <td>2) Trainees received: 26 persons in Japan and 6 persons in Iran</td> <td>2) Facilities: Project office, Experiment stations</td> </tr> <tr> <td>3) Equipment: mini buses, tractors, agriculture equipment, soil analysis equipment, soil analysis apparatus, computers and OA equipment, etc.</td> <td>3) Local expenses</td> </tr> <tr> <td>4) Local expenses: Infrastructure development for experiment stations</td> <td></td> </tr> </table> 			Japanese side:	Afghanistan side:	1) Experts: 8 persons (Japanese long-term), 17 persons (Japanese short-term) and 2 persons (short-term from the third country)	1) Staff allocated: 38 persons	2) Trainees received: 26 persons in Japan and 6 persons in Iran	2) Facilities: Project office, Experiment stations	3) Equipment: mini buses, tractors, agriculture equipment, soil analysis equipment, soil analysis apparatus, computers and OA equipment, etc.	3) Local expenses	4) Local expenses: Infrastructure development for experiment stations	
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Project Period	July 2005 – March 2011 (Extended period: July 2010 – March 2011)	Project Cost	(ex-ante) 700 million yen, (actual) 951 million yen										
Implementing Agency	Agricultural Research Institute of Afghanistan (ARIA), Ministry of Agriculture, Irrigation and Livestock (MAIL) *ARIA was known as the Research Department of the Ministry of Agriculture and Food Stuff (MAFS) until 2004 and as the Research Department of the Ministry of Agriculture, Animal Husbandry and Food (MAAHF) until 2008.												
Cooperation Agency in Japan	Ministry of Agriculture, Forestry and Fisheries of Japan												

II. Result of the Evaluation

<Constraints on Evaluation>

- Due to lack of security at the time of ex-post evaluation, there was a limitation of data collection and site observation of Balkh area.

< Special Perspectives Considered in the Ex-Post Evaluation >

Evaluating Continuation Status of Effectiveness (Continuation status of achievement for Project Purpose)

- In order to verify its continuation status of the Project Purpose, “The research and technology development of Research Department and CAES are strengthened”, the current status of facilities and equipment of CAES and ARIA was reviewed in addition to the officially-set indicators.

Evaluating Achievement Status of Overall Goal

- The project did not set the target year for the Overall Goal. Based on the description of the Ex-Ante Evaluation Report that the ex-post evaluation would be conducted in three years after project completion, the target year is assumed to be 2014. However, since the data as of 2014 was not available, we examined the data at the time of ex-post evaluation.

1 Relevance

<Consistency with the Development Policy of Afghanistan at the Time of Ex-Ante Evaluation and Project Completion>

At the time of ex-ante evaluation, this project was consistent with the National Development Framework in which the agricultural

development was placed in “natural resource management”, one of the twelve National Development Programs. Under this program, the Ministry of Agriculture and Food Stuff, currently known as MAIL, set up the five National Priority Programs, one of which was “Increasing agricultural production and incomes”. For realization of this program, “Institutional strengthening and capacity building in research and agricultural extension services” became a key measure to be taken. At the time of project completion, “National Priority Plan in Agriculture and Rural Development Cluster” was presented at Kabul Conference in July 2010, in which the improvement of comprehensive agricultural productivity and farmers’ economy was regarded as one of the priority components. Thus, strengthening of agricultural experiment stations and an extension system was considered as one of the important policy areas.

<Consistency with the Development Needs of Afghanistan at the Time of Ex-Ante Evaluation and Project Completion>

At the time of ex-ante evaluation, this project was consistent with Afghanistan’s development needs in the agriculture research and technology development as described in “Background” above. At the time of project completion, there were continuing needs to develop various agricultural technologies in order to improve agricultural productivity.

<Consistency with Japan’s ODA Policy at the Time of Ex-Ante Evaluation>

The government of Japan set its policy to support the Afghanistan agriculture sector in the form of Integrated Rural Development because it was imperative to revitalize the agriculture sector as the major industry with the largest working population.¹

<Evaluation Result>

In light of the above, the relevance of the project is high.

2 Effectiveness/Impact

<Status of Achievement of the Project Purpose at the time of Project Completion>

By the project completion, the project achieved its purpose: “The research and technology development of Research Department and CAES are strengthened”. The Research Department, currently known as ARIA, took initiatives to hold the Annual Review Meeting independently in which they reviewed and discussed research achievements of the year with researchers of CAES and other experiment stations as well as planned the research schedule for the following year (Indicator 1). Seven of the ten sub-programs developed through researches reached to the satisfactory level for technology development, achieving the target (Indicator 2). Various workshops and seminars to strengthen the technology development were implemented, although the number of such activities jointly implemented with extension departments was limited (Indicator 3).

<Continuation Status of Project Effects at the time of Ex-post Evaluation>

After the project completion, the project effects have continued. ARIA has continued to take initiatives to carry out the Annual Review Meeting with 70 to 80 researchers as participants each time and has published a report on each meeting (Indicator 1). Furthermore, researchers have shared the result of the researches with extension officers through the Annual Review Meeting as well as through field days when needed in order to finally reach out to farmers. Since many researches on agricultural technologies have been continued, varieties of bread wheat, durum wheat and so on have been released among the 1,000 lines of wheat under research (Indicator 2). As for the joint activities with the extension departments, only one conference on wheat and barley research has been held since, according to ARIA staff, remaining researches were not related to extension (Indicator 3). Most of the facilities rehabilitated under the project have been utilized except at Darulaman Station. Its soil department was merged with Badam Bagh Station in 2009, and its remaining departments related to cereal crops improvement with Benehesar Agricultural Farm in 2015. Most of equipment procured under the project have also been utilized except some, which have left unused for several reasons, such that the materials needed for the operation of equipment was not obtainable due to the budget constraint, some spare parts were not available in Afghanistan and the staff were not trained enough to use them, etc.

<Status of Achievement for Overall Goal at the time of Ex-post Evaluation>

It is observed that the project has achieved its Overall Goal, i.e. “Research Department and CAES are able to play a central role for improvement of agricultural production and rural livelihood through its activities unifying research and technology development in collaboration with extension departments in the priority areas”. The interviews with extension officers and ARIA staff in Kabul revealed that farmers had applied technologies developed under the project, such as the drip irrigation method, utilization of green houses and so on, though the number of farmers who had applied each technology was not available (Indicator 1). In the same interviews, the extension officers acknowledged that those farmers had been satisfied with those technologies because of its simple application (Indicator 2). As described above, the collaboration with extension departments in research activities was limited, thus close coordination between research and technology development and extension activities may not have been fully materialized.

<Other Impacts at the time of Ex-post Evaluation>

Some ripple effects were identified during the ex-post evaluation study. According to the interview with the experiment station staff, the method of covering melon with cotton bags to control melon fly has contributed to improve the quality of melon. This method, in combination with soil analysis and soil fertility improvement, has also contributed to increase in yield of melon production.

<Evaluation Result>

Therefore, the effectiveness/impact of the project is high.

Achievement of Project Purpose and Overall Goal

Aim	Indicators	Results
(Project Purpose) The research and technology development of Research Department and CAES are strengthened.	Indicator 1: ARM (Annual Review Meeting) is conducted by the initiative of ARIA.	Status of the Achievement: achieved (continued) (Project Completion) • ARIA started the Annual Review Meeting in January 2008 and held the meeting once every year ever since. ARIA took the initiative to plan, manage, and review the meeting independently. Participants of the meeting were comprised of not only researchers of CAES, but also those of local experiment stations, who discussed research achievements of the year and formulated the schedule for the following year. (Ex-post Evaluation) • After the project completion, the Annual Review Meeting has continued with ARIA’s initiative being assisted by a development budget. Results of the research as well as a future plan of each

¹ Source: ODA Databook in 2005

		department have been shared among 70 to 80 participants each time and a report of the meeting has been published. Furthermore, researchers have shared the result of the researches with extension officers through the Annual Review Meeting as well as through field days when needed, so that farmers can learn about the researches through extension officers.																			
	Indicator 2: By January 2010, technologies will be developed from half of the selected research subjects at sub-program level.	Status of the Achievement: achieved (continued) (Project Completion) • The Terminal Evaluation Team judged that seven out of the ten sub-programs reached a satisfactory level for technology development. Most significant technologies developed under the project were seven new wheat and three potato varieties registered from 2007 to 2010. (Ex-post Evaluation) • After the project completion, many researches have been done, such as maize cultivation method by machines, new methods of wheat cultivation by machines, intercropping of wheat with maize, sprinkle irrigation and drip irrigation methods, etc. Annually, 1,000 lines of wheat have been under research. As a result, 30 varieties of bread wheat, three varieties of durum wheat, four varieties of rice, etc. have been released.																			
	Indicator 3: By January 2010, regular activities, such as seminars/workshops, to disseminate the research results will be conducted jointly with the extension department.	Status of the Achievement: partially achieved (partially continued/) (Project Completion) • Since the commencement of the project, various workshops/seminars were held under the project as shown below. However, only some portion of these activities was planned or conducted jointly with the extension departments. The institutional framework to conduct joint activities with the department was not fully established. <table border="1"> <thead> <tr> <th>Activities</th> <th>Frequency</th> <th>Number of Participants</th> </tr> </thead> <tbody> <tr> <td>Seminars</td> <td>15</td> <td>82</td> </tr> <tr> <td>Workshops</td> <td>10</td> <td>1,151</td> </tr> <tr> <td>Training</td> <td>19</td> <td>383</td> </tr> <tr> <td>Field Days</td> <td>7</td> <td>572</td> </tr> </tbody> </table> (Ex-post Evaluation) • Only one conference, namely “National Wheat and Barley Research Conference”, took place in 2018 jointly with the extension departments. Other seminars and workshops have not been held jointly with the extension departments.	Activities	Frequency	Number of Participants	Seminars	15	82	Workshops	10	1,151	Training	19	383	Field Days	7	572				
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(Overall Goal) Research Department and CAES are able to play a central role for improvement of agricultural production and rural livelihood through its activities unifying research and technology development in collaboration with extension department in the priority areas.	Indicator 1: Development technologies under NARP* are applied in the priority areas. * National Agricultural Experiment Stations Rehabilitation Project (= this project)	(Ex-post Evaluation) achieved • According to the interviews with around 15 staff of ARIA, the following research outcome (technologies developed) under the project have been applied in the priority areas. The number of farmers who have applied those technologies is unknown. <table border="1"> <tbody> <tr> <td>1</td> <td>Characterization and selection of wheat varieties</td> </tr> <tr> <td>2</td> <td>Characterization and adaptation of newly introduced legume varieties to agro-environment</td> </tr> <tr> <td>3</td> <td>Effect of fertilizer application and irrigation methods on growth and yield of fruit trees</td> </tr> <tr> <td>4</td> <td>Effect of amount and time of fertilizer application and of irrigation on growth and yield of vegetables</td> </tr> <tr> <td>5</td> <td>Cultivation trial of local and newly introduced varieties of vegetables</td> </tr> <tr> <td>6</td> <td>Control of insects and diseases, and selection of resistance varieties</td> </tr> <tr> <td>7</td> <td>Drip irrigation method on tomato</td> </tr> <tr> <td>8</td> <td>Application of gibberellic acid on fruits</td> </tr> <tr> <td>9</td> <td>Application of sulfur and nutrients into soil for cultivating different crops</td> </tr> </tbody> </table>	1	Characterization and selection of wheat varieties	2	Characterization and adaptation of newly introduced legume varieties to agro-environment	3	Effect of fertilizer application and irrigation methods on growth and yield of fruit trees	4	Effect of amount and time of fertilizer application and of irrigation on growth and yield of vegetables	5	Cultivation trial of local and newly introduced varieties of vegetables	6	Control of insects and diseases, and selection of resistance varieties	7	Drip irrigation method on tomato	8	Application of gibberellic acid on fruits	9	Application of sulfur and nutrients into soil for cultivating different crops	
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	Indicator 2: Farmers will be satisfied with technologies developed under NARP in the priority areas.	(Ex-post Evaluation) partially achieved • According to interviews with extension officers and ARIA staff, farmers have been satisfied with technologies developed under the project. The number or ratio of farmers who had shown satisfaction is unknown. <table border="1"> <thead> <tr> <th>Areas</th> <th>Name of Applied Technologies</th> <th>Satisfaction Level (from 1 to 5, being highest)</th> <th>Reasons</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Kabul</td> <td>Drip irrigation method</td> <td>4</td> <td>This method has the potential to save water and nutrients by allowing water to drip slowly to the roots of plants. It is easily applicable in vegetables.</td> </tr> <tr> <td>Utilization of green houses</td> <td>4</td> <td>It is a good method for vegetables</td> </tr> <tr> <td>Balkh</td> <td>Melon coverage method by cotton bag</td> <td>3</td> <td>Easy to apply for mechanical control of melon fly. Effective for controlling melon fly</td> </tr> <tr> <td>Bamian</td> <td>Potato storage</td> <td>4</td> <td>Easily applicable</td> </tr> </tbody> </table>	Areas	Name of Applied Technologies	Satisfaction Level (from 1 to 5, being highest)	Reasons	Kabul	Drip irrigation method	4	This method has the potential to save water and nutrients by allowing water to drip slowly to the roots of plants. It is easily applicable in vegetables.	Utilization of green houses	4	It is a good method for vegetables	Balkh	Melon coverage method by cotton bag	3	Easy to apply for mechanical control of melon fly. Effective for controlling melon fly	Bamian	Potato storage	4	Easily applicable
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Source: Terminal Evaluation Report, Interviews with extension officers and ARIA staff

3 Efficiency

Both the project period and the project cost exceeded the plan (ratio against plan: 113% and 136%, respectively). The Outputs of the project were produced as planned. Therefore, the efficiency of the project is fair.

4 Sustainability

<Policy Aspect>

The Government of Afghanistan has been advancing agriculture development based on “National Comprehensive Agriculture

Development Priority Program (2016-2021)” which includes the improvement of irrigation systems, wheat production increase, strengthening of horticulture value chain, etc. Under this program, ARIA sets its policy, namely “National Agriculture Research Policy (2018-2028)” to strengthen applied agricultural research for technology development, and to support such research agenda.

<Institutional Aspect>

ARIA assumes the overall responsibility on agriculture research and technology development in collaboration with CAES. Under the General Directorate of Agricultural Research, there are four departments, namely Animal Husbandry Research, Crop Genetic Resources and Improvement, Soil Science and Natural Resources Conservation Research and Socio-Economics and Marketing Research. According to the interview with ARIA staff, the function of each research station in seven agro-ecological zones is clearly identified, and likewise the job description of each staff. The current number of staff in each department is sufficient to carry out the research activities.

<Technical Aspect>

ARIA has experienced internal transfer of staff among several departments and staff change due to retirement, etc. The number of staff may change after the organizational reform. Many training programs in the country and abroad for ARIA staff have been available. Most of those training programs have been conducted by donors or under donor related projects. As described above, some of the equipment in the soil laboratory have remained unused.

<Financial Aspect>

Though the data is not available, according to the interview with ARIA staff, the budget to continue the agricultural research and development has been secured to some extent through a development budget, which is not stable, and thus may not be sustainable. After the organizational reform in ARIA, it is expected that there will be some improvement in budget allocation for each department and to CAES.

<Evaluation Result>

In light of the above, some problems have been observed in terms of the technical and financial aspects of the implementing agency. Therefore, the sustainability of the effectiveness through the project is fair.

5 Summary of the Evaluation

The project achieved the Project Purpose to strengthen the research and technology development of ARIA and CAES. The effects of the project have continued after the project completion, though the collaboration with the extension departments has been limited. The Overall Goal for ARIA and CAES to play a central role to improve the agricultural production and rural livelihood has been achieved. As for the sustainability, there are some problems in technical and financial aspects but no problem in policy and institutional aspects. As for the efficiency, both the project period and cost exceeded the plan.

Considering all of the above points, this project is evaluated to be satisfactory.

III. Recommendations & Lessons Learned

Recommendations for Implementing Agency: MAIL

- In order to enhance the sustainability of the project, it is recommended that MAIL allocate a sufficient budget to ARIA for continuation of the Annual Review Meeting and for the maintenance and operation of facilities and equipment procured under the project.

Lessons Learned for JICA:

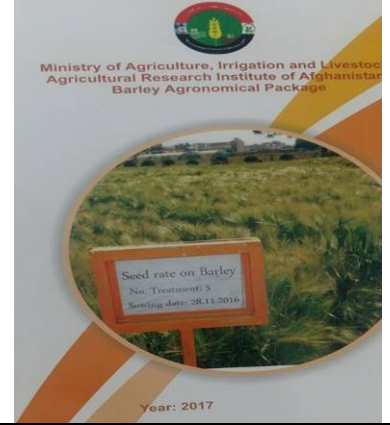
- The ex-post evaluation study revealed that some of the equipment in the soil laboratory have remained unused by ARIA. This is because ARIA staff have not been well trained and some spare parts of equipment are not available in Afghanistan as well as materials needed for its operation are not obtainable with limited budget. JICA should have conducted training more effectively on how to use and maintain each equipment procured under the project considering the actual settings in Afghanistan.
- Results of the survey revealed that the technologies introduced by the project have been applied by farmers because of its simple application (e.g. drip irrigation, utilization of green houses and so on). JICA needs to consider such technologies to be incorporated into the formulation of new agriculture projects in the future.
- MAIL has recognized the contribution of Annual Review Meeting as an effective mechanism, through which the results of researches conducted in the field have shared among extension officers who can instruct farmers, through which ARIA has also disseminated the results of researches in the form of publication, namely “Annual Review Meeting Report”. Furthermore, the brochures which contain the best practices of research results have been distributed at the meeting to reach out to farmers. In this way, the Annual Review Meeting has served as a good platform for sharing knowledge among all those concerned, which eventually contributed to strengthening the research and technology development, and further to increasing the agricultural production. It is preferable that JICA will consider such mechanism, “a platform for sharing knowledges”, as one of the components of future projects.



Green house introduced by the project have been utilized for vegetables cultivation



Equipment provided by the project to Soil Lab have still been used for soil analysis



Brochures containing the best practices extracted from the research results have been distributed at the Annual Review Meeting to reach out to farmers.