終了時評価調査結果要約表（英文）

I. Outline of the Project		
Country：Syria Arab Republic		**Project title**：Project on Development of Efficient Irrigation Techniques and Extension in Syria
Issue/Sector：Rural Development		**Cooperation scheme**：Project-type Technical Cooperation
Division in charge：JICA Syria Office		**Total cost**：370 million Yen
Period of Cooperation	**(R/D)**：2004.11.10～2008.3.31	**Partner Country's Implementing Organization**：General Commission for Scientific Agricultural Research（GCSAR）, Extension Department（DOE）, Directorate of National Project of Modern Irrigation Conversion（DMIC）, Ministry of Agriculture and Agrarian Reform（MAAR）
		Supporting Organization in Japan：Ministry of Agriculture, Forestry and Fisheries

1. Background of the project

In Syria, agriculture provides nearly 30% of the total GDP of the largest in the industry. The population is 17.3 million people and population growth rate is 2.7%, and agriculture has been positioned one of the most important issues of national policy. Rain-fed agriculture is still major, 75% of the total area of farmland. Rain-fed agriculture is strongly influenced by the climate; therefore, agricultural production has become extremely precarious. Meanwhile, 25% of the total area of farmland is irrigated and consumes more than 80 percent of the total water use in Syria, hindering to provide water resource to other sectors such as industry and domestic water use. The efficient use of water for agriculture is an important issue. The five-year plan (2000-2004) of Syrian government issues that traditional irrigation should be transferred to water-saving irrigation; however, the target has not achieved yet.

Under these circumstances, the Syrian government requested technical cooperation to the Japanese government in order to improve the situation, in which Ministry of Agriculture and Agrarian Reform (MAAR) is designated as an implementation organization. Accordingly, Government of Japan conducted pre-evaluation study in order to examine the request during February to October, 2004. Based on the result of the study, both Syrian and Japanese sides agreed and signed R/D of the Project implementation commenced in November 2004 and will terminate in March 2008.

2. Project Overview

(1) Overall Goal

Water use efficiency is improved, and water loss is reduced in the farmers' fields of project areas.

(2) Project Purpose

Proper amount of irrigation water is used for each crop in the Project sites, through adequate supports provided by the strengthened training/extension activities.

Capability for promoting water saving modern irrigation is raised in the organizations /staffs concerning the Project areas.

(3) Outputs

1. Satisfactory water saving efficient irrigation techniques are established according to the local conditions project sites.
2. Irrigation engineers and extension workers concerning the project are able to transfer knowledge to farmers in terms of water saving modern irrigation method.
3. Farmers in the project areas are guided so as to adopt efficient irrigation for each crop individually through providing extension services.

(4) Inputs (as of November 2007)

<Japanese side>

Long-term Expert: Total number 3 Short-term Expert: Total number 5 (In total:116.0 MM)

Trainees received in Japan & Counterpart study tour of the Third country: 18

Local Cost: 10.339 million Yen (equivalent to 4.535 million SYP)

Provision and Procurement of Equipment:.22.5 million Yen (equivalent to 9.87 million SYP)

<Syrian Side>
Land, building and facilities provided
Counterparts: In total 34
Local Cost: 1.203 million SYP

II. Evaluation Team

Syrian Evaluation Team was also formulated with two members, and this evaluation was conducted by forming the Joint Evaluation Team.

Members of Evaluation Team	Team Leader	Mr. TAMABAYASHI Yosuke	Deputy Resident Representative, JICA Syria Office
	Efficient Irrigation	Dr. NAKANO Yoshisuke	Emeritus and Academic Special Researcher, Institute of Agriculture, Kyusyu University
	Training, Extension and Cultivation	Mr. NAKABAYASHI Kazuo	Project Formulation Advisor,
	Cooperate Planning	Mr. YOKOI Yukio	JICA Jordan Office Group Leader, Field Crop Based Farming Area Group, Rural Development Department, JICA
	Evaluation Management	Ms. MURAKAMI Mayumi	Assistant Resident Representative, JICA Syria Office
	Evaluation Analysis	Mr. Akira MATSUMOTO	President, A&M Consultant Inc.
Period of Evaluation		10/11/2007～30/11/2007	**Type of Evaluation**：Final Evaluation

III. Results of Evaluation

1. Summary of Evaluation Results

(1) Project Purpose

➢ Verifiable Indicators 1;

Total amount of irrigated water in the Project sites decreases to 10～20% (of the same at the point before project starting) by the completion of the Project.

Achievement;

Water use reduction in average is 21% while it varies over different crops and conditions with the range between-7% (potato, Hama) and 43% (pear, Rural Damascus) decreases as shown in Table 1 attached. With cotton which has high water requirement, remarkable reduction was observed 25%.

➢ Verifiable Indicators 2;

Crop production in the Project sites remains at the same level as before the commencement of the Project.

Achievement;

The level of crop yield in average remains at the same level (approx 100%) while it varies over different crops and conditions with the range between -37% (pear, Rural Damascus) and 149% (eggplant, Daraa) increases as shown in Table 1 attached. It is remarkable that with cotton in Hama, the yield increase by 126%.

➢ Verifiable Indicators 3;

New responsible organization for modern irrigation is established.

Achievement;

Directorate of Modern Irrigation Conversion was established and is under operation.

➢ Verifiable Indicators 4;

Responsible governmental organizations become capable of promoting water saving modern irrigation.

Achievement;

As casting vote of managing extension activities on modern irrigation in local level was transferred from Directorate of Extension in the central government to the agricultural governorates, circumstance of holding extension activities for the extension workers was improved. Due to enhancement of such, extension activities like model field day became to be implemented by own management of extension workers.

(2) Output

- Verifiable Indicators1;

  Irrigation equipment for efficient irrigation are properly installed and operated in 90% (or more) of the plots of farmers concerned in project sites.

- Achievement;

  According to the result of inspection of the demonstration farms utilizing a check sheet which is composed of 15 check items, all of 7 demonstration farms were satisfactory for this requirement (100%). In this respect, 101 out of 105 check items in total were appropriate (96.2%).

- Verifiable Indicators2;

  More than 50% of farmers quantify the appropriate volume of irrigation water for each crop in project sites.

- Achievement;

  All farmers at demonstration farm understood the appropriate amount of the water to use.

- Verifiable Indicators3;

  More than 50% of farmers understand the significance of water saving in irrigation in project areas.

- Achievement;

  According to the result of socio-survey, about 81% of the farmers raised the awareness of water saving, namely 97% in Hama, 61% in Rural Damascus, and 86% in Daraa respectively. The results show considerably higher than the ratio of the same obtained in the baseline survey.

2. Evaluation based on the Five Criteria

(1) Relevance

The Project is considered to be highly relevant in terms of policy, needs of beneficiaries, identification of target group and project planning. The relevant of the Project has been kept, judging from the following reasons:

<Consistency with the Syrian Government Policy>

Saving irrigation water, the direction of this Project is in line with the national priorities. The objective of this Project is in line with "the 10th Five-Year Plan on National Development", and also agricultural development policy of Syria. The Syrian government has been encouraging and urgently accelerating to change the present conventional much water-consuming irrigation to a modern irrigation in order to conserve scare water resources.

< Consistency with the Japanese Aid Policy>

The Country study conducted by JICA in terms of Japan's ODA to Syria, states that management and effective use of water resources is one of the highest priorities of the Japanese aid policy. This Project has been currently stated at one of the core program called "Water Resources Management and Effective Use" in the rolling plan for Syria in JICA. The Project exactly focuses on that. Therefore, it can be determined that the Project is consistent with the Syrian government and also Japanese aid policy.

< Needs of Beneficiaries (Target Group)>

As the effective water use in irrigated agriculture is essential for farmers in the long run, the Project has provided a good opportunity to meet such farmers' needs. Particularly the farmers who had introduced irrigation equipment, they did not know how to save water with relevant techniques and information. Furthermore, the Project approach and concept were appropriate in line with the farmers' needs. Thus, the Project is relevant in line with such beneficiaries' demands.

< Identification and Selection of Target Group>

In this Project, officials from various organizations involved in water saving activities and extension agents in the village level were considered as the "target group". In additions, the farmers in the targeted Provinces were as an ultimate target group of the Project. To promote efficient irrigation techniques and extension in Syria, this Project covered from central to local level, and worked on the necessary organizations and departments to cooperate together. Therefore, it is relevant of the identification and selection of the group in the Project.

< Relevance of Project Planning>

More than 60% of irrigation water amount in Syria is extracted from underground, then, the Project was focused on such groundwater areas and properly selected the Project areas based on the baseline survey. The demonstration farms were carefully chosen as good representative place with certain circumstance, like agricultural and water irrigation situation. At the initial stage of the Project, the need assessment such as baseline survey was conducted to grasp farmers' needs and their problems, and the results reflected into the Project component and detail activities, therefore through such careful and detail study, it was relevant and all the activities were set up with practical and applicable to extension workers and farmers.

(2) Effectiveness

<Achievement of Project Purpose>

The Project was carried out on schedule and the Project has attained project purpose as below.

1) Saving water use (water use reduction is average is 21% in the Project sites), 2) Remaining at the same level of crop production (even some crops in some farms increased their yields) 3) Establish and operate new organization for modern irrigation, and 4) Capability of responsible organizations.

Therefore, the effectiveness of the Project is considered to be high. This Project was enabling to achieve irrigation water savings on farm level through the extension activities provided to farmers, in the comparison with the experimental fields in research stations. And also the Project could manage to train extension workers, and deliver them the necessary information in the scope of efficient irrigation and optimal use of water resources. Most activities have been implemented as scheduled, and each Output has contributed to the achievement of the Project purpose.

(3) Efficiency

<Efficiency of Project Inputs>

The Project was efficient of planned inputs. In general, inputs by both Japanese and Syrian side were mostly adequate and sufficient in terms of the volume as well as of the quality to produce the intended outputs. All inputs allocated to the Project have been fully utilized for project implementation as well as optimal use of time. All those inputs brought a successful project without losing time or wasting resources.

<Efficiency of Human Resource Inputs>

Japanese experts have played core roles of technical transfer and they have taken coordinating and supervising role in order to mutual relationship with Syrian counterparts and also other related organization staff. The Syrian counterparts have been assigned as scheduled in spite of some change and transfer, and their qualification, ability and motivation were quite high, and they have contributed to attain the necessary activities' completion.

< Efficiency of Equipment Inputs>

All the equipment was appropriately provided. The equipment has been effectively used in the various aspects of three project activities: a) establishing of efficient water saving irrigation techniques, b) training for irrigation engineers and extension workers, and c) providing extension service to the farmers. There is no any problem of maintenance.

< Efficiency of Budget Inputs>

Both sides on Japan and Syrian government have properly provided the necessary budget designed in the Project. The necessary budget and supports was fairly given by the counterpart organizations and related organizations, except for occasional shortage of fuel expense for cars.

< Efficiency of Training Inputs>

The training was conducted, in countries selected on demands. The total number of the Syrian trainees was 18; 10 sent to Japan, 5 to Greece, and 3 to Jordan. Especially, all counterpart personnel who participated in Japan made great contribution to the Project. The experience has brought the skills and information, furthermore the additional effect to deepen their understanding of the Project implementation and improve their motivation for the Project.

< Efficiency between Activities and Inputs>

According to the planned activities in training and extension, each activity has been undertaken efficiently and good results were realized. For instance, the Subject Matter Specialist (SMS) trainees were selected carefully from the ex-trainees of "Water Extensionist (WE)" course, and they were represented from targeted Project areas. Once the SMS trainees returned to their organizations, they will play the important roles hereafter. However, the training duration was not long enough, and they requested some more training courses, more related courses, and some brochures delivery for effective extension.

< Project Management>

The Steering committee was timely and effectively held in appropriate stages, which promoted mutual understanding of the Project achievement among related organizations. For instance, in the third steering committee held in January 2007, the member of the committee reached the agreement that DMIC joints the counterpart alliance of the Project as a counterpart organization.

<Linkage with other Related Human Resources & Organizations>

Japanese volunteers have been dispatched related to the agricultural research centers within the Project areas. They had played vital roles to build local linkage and also human relationship.

(4) Impact

It is too early to judge the Project impacts in this stage, however, the positive impacts were observed as below.

< Establishment of New Organization>

DMIC was established to achieve the modern irrigation conversion program (2006-2015). The Project assisted to establish and build up the organization capacity, particularly supported for the staff training. The training was effective as institutional development of such newly established directorate, which will be a good driving-force to introduce and promote modern irrigation system at farmers' fields.

<Confidence and Experience by the Project Counterparts>

The Project counterparts became gradually confident to make any training plan and undertake extension activities in the Project, and as the Project planned, the counterparts became capable to make other training plan and successfully accomplish, such as training for Iraq extension workers.

<Farmers' awareness on Saving Water and Benefit in the Field>

Following the advice from the Project counterparts and extension workers, some farmers came to be aware of the importance of efficient water use, and enjoying the cost savings and resultant income increase. In detail, they were benefited from saving diesel oil consumption, labor cost, fertilizer's use and increasing the yield in some cases in the Project areas.

<Utilization of the Project Productions>

The production by the Project such as leaflet and manual has been utilized by other organization. Initiated by ANRR, the leaflet which explained the necessity and advantage on saving water and the loan program to introduce modern irrigation was prepared and delivered to the nationwide.

<Establishment of New Methodology of Training and Extension in the Field Level>

Such as field day, practical demonstration and extensions manual, all those training and extension activities introduced through the Project were new method in Syria for the trainers and extension workers as well as farmers, and they welcomed such practical methodology and approach. This Project represented as a "pilot" or "model" project in Syria in the sense of good field practice regarding to efficient irrigation.

<Launch of New Training Course>

One good example, new technical training course on water saving modern irrigation was launched at governorate level by DMIC. In this training course, some trainers were the ex-trainees of the Project participated, and they gave the lectures by utilizing the teaching materials of the Project.

(5) Sustainability

Prospect of sustainability is high in terms of technical, policy and financial aspects, however, the institutional sustainability is not sufficiently secured at this time.

< Technical Aspects>

The counterparts and ex-trainees are now capable to carry out duties such as training plan implementation, and also undertake effective extension activities, because their knowledge have been upgraded and they have become more confident in applying the Project's activities than before the Project started. Meanwhile, the Demo farmers have acquired their knowledge and skills. In conclusion, the counterparts can carry on their duties related to the Project by themselves; however ex-trainees still need some technical consultation. The teaching materials and training guidelines are useful to support future training activities by the counterparts. The position of current counterparts shall be stable and secured without changing their roles and/or shifting their working places. The equipment provided by the Project will be maintained well and fully utilized even after the Project.

< Policy Aspects>

It is certain the Syrian government will provide continuous supports to promote efficient irrigation techniques and extension in order to conserve scare water resources and to achieve government goal according to the national policy. Therefore, as much as strong support by the government, all the counterpart organizations will be able to sustain and provide necessary assistance to the farmers who are eager to install/manage modern irrigation properly.

<Institutional Aspects>

Each organization involved in the Project has its own mandatory role to promote modern irrigation system. Under such relevant role, it is more likely that the Project outcomes will be maintained. However, giving the importance of institutional sustainability and water saving issues, the following should be tackled; 1) how to coordinate continuously among different organizations and central/local level structure; define and confirm the administrative and organizational structure under the reform of MAAR, 2) secure the training & extension staff and strengthen their capacity building on the staffs' belonging organization, and 3) how to promote and support farmers who are interested to introduce modern irrigation.

<Financial Aspects>

It is sustainable to secure the budget to the Project activities such as water saving training. To secure the budget and financial sustainability, it is necessary to commit by government for continuous supports in efficient irrigation. In addition, it is necessary to pay attention to maintain the training system and the Project outcomes, special care shall be given to the ex-trainees so that they can effectively display their skills and knowledge of modern irrigation.

3. Factors that promoted realization of effects

1) Good Collaboration between Various Organizations

The linkage between various organizations positively encouraged the achievement of the Project purpose. For example, the experiences obtained through the management of demonstration farms were effectively utilized for training and extension activities. Also the experiences obtained through the Project activities were effectively utilized for the preparation of technical manuals. Those harmonized collaboration gave all promoting factor for the Project.

2) Support by Extension Workers and Government Strategy

The extension workers of support/extension units who have been assigned at the Project sites made great efforts to collaborate and participate actively for the Project implementation. The government policy on encouraging modern irrigation have enhanced to assure the importance of the saving water in irrigation and to support obviously this Project. This fact was confirmed through the establishment of new department concerned with executing techniques of modern irrigation.

3) Timing and Circumstance of Project Starts

It was very good timing and circumstance of this Project starts, because it is reasonable on time for not only government initiatives, but also the rapid introduction of modern irrigation such as sprinkler irrigation, and furthermore, the most farmers faced the depression of ground water resource in recent years. Therefore, saving irrigation water was urgent tasks for both government and farmers. Then, the Project is adequately and properly implemented on right time.

4. Factors that impeded realization of effects

1)Negative Influence Caused by Drought

In fact, serious drought has affected negatively in some Project areas and also has influenced to the data collection on site, however, the climate change was beyond the Project control.

2)Number of Demo Farm Targeted and also Difficulties of Farmers' mind Change

The number of demonstration farm was not sufficient to cover the diversified in crops, soil, and irrigation method introduced by farmers. In additions, to manage the irrigated land properly, it is constraint not only to purchase irrigation equipment by financial condition, but also to change the farmers' mentality and attitude.

5. Conclusion

The Project purpose shown in the PDM will be achieved by the end of the Project period. However, for attaining the overall goal, furthermore, several subjects were pointed out by the Joint Evaluation Team and recommended in this report. Referring to the findings mentioned above, it is concluded that:

-the Project activities have been satisfactorily implemented without any major or critical problems with good collaboration among the Syrian relevant organizations and with appropriate support of Japanese experts; and,
-since it is most likely that the Project will achieve its objectives successfully by the end of the planned period, it is concluded that the Project will be completed on March 31st, 2008 as originally scheduled.

6. Recommendations

The following subjects should be carried out in collaboration by the Project team.

(1) Subjects to be Completed by the End of the Project

1) Finalization of Training and Extension Materials

The technical manual is currently reviewed and translated into Arabic. The manual and other extension and training materials should be combined and disseminated as an appropriate tool for efficient water use training by the Project team.

2) Analysis of Efficient Irrigation Techniques

2-1)Quantitative and qualitative analysis of efficient irrigation techniques

This analysis should be carried out in a comparative methodology to show advantages of the applied irrigation techniques by the C/P with Japanese experts' support. It is recommended to make a distinction between traditional irrigation farms, monitoring farms and demonstration farms and study associated impacts on water and land use in terms of water-saving, labour-saving, fuel-saving, fertilizer and pesticides control, and yield increase.

2-2) Fundamental analysis of cost/benefit of efficient irrigation techniques

Simple trial calculations by the Project team may help farmers to understand the importance and possible consequences of their water saving actions and could be incentive for introducing the new irrigation systems.

3) Problem Identification and Strategy Formulation for Promotion of Efficient Irrigation Techniques

3-1) Confirmation of the mandates of relevant organizations and their coordination

Clarification of the mandates and preparation of action plans of the respective organizations are essential for good collaboration.

3-2) Organizing the national task force

A national task force should be established to ensure sustainable execution of SMS training course by MARR.

3-3) Identification of problems in using wells for irrigation

Tendency of groundwater table, cost of pumping, and water quantity of wells in the demonstration farms will be reviewed by the Project.

(2) Subjects to be Accomplished after the Project

1) Promotion of Further Training and Extension Activities

1-1) Training of SMS of irrigation

1-2) Technical support on how to maintain the introduced modern irrigation equipment

1-3) Collaboration work on promotion of efficient irrigation techniques

Relevant organizations of research, training, extension units of efficient irrigation techniques at national and governorate levels should collaborate.

1-4) Formulation of an action plan by extension units and supporting units to effectively use of the Project outcomes

1-5) Expansion of the Projects activities to other districts in Rural Damascus, Daraa and Hama governorates, furthermore, to other governorates.

2) Promotion of Further Applied Research

2-1) Formulation of action plan of applied research to promote further efficient water use nationwide, such as meteorological data analysis, water requirement estimation and soil data analysis.

2-2) Establishment of wider link of information exchange and cooperation between

Ministry of Irrigation, International Center for Agricultural Research in Dry Areas (ICARDA), Arab Center for the Studies of Arid zones and Dry lands(ACSAD) and universities

3) Integrated Approach for Efficient Water Use

3-1) Promotion of efficient water use in terms of underground water resources should be considered in a broader context under an integrated framework, including resource management of surface water. In this sense, collaboration and policy coordination within and among related organizations should be continuously sought.

3-2) Water-saving efforts by improving surface irrigation such as laser-leveling, installation of flow meters etc.

3-3) Water-saving efforts by agronomy aspects such as improving water-holding capacity of soils, introduction of drought tolerant varieties, strengthening root activities etc.

3-4) Environmental issues such as salt accumulation and spillage of fertilizer and chemicals

4) Enhancement of Introducing Modern Irrigation Equipment through the Loan program

4-1) Technical guidance of operation and maintenance of the equipment for the farmers.

4-2) Clarification of the mandates of relevant organizations such as DMIC, Directorate of Extension, Directorate of Land & Water (newly established) etc. for promotion of modern irrigation equipment

7. Lessons Learnt

1) The Project was designed in response to the farmers' needs and carried out with participatory approach. Furthermore, the changing process of extension workers' and farmers' awareness of water-saving was recorded by the Project in detail. As the results, extension workers and researchers have convinced the necessity of water saving from the viewpoint of farmers' benefits as well as efficient use of the limited water resources, while farmers have been informed the various benefits of water-saving.

2) However, the Project sites were limited and the Project period was as short as 3 years, the model could not be widely disseminated to surrounding areas nor the Project could not put many farmers into practice. It is recognized that the mobilization of farmers requires enough time period, that is, the remarkable and sustainable change in farmers' awareness cannot be attained within such a short period.

3) In addition to the practical experiences at the demonstration farms, this process accomplished by the efforts of project staff contributed to establishing simple but essential model of changing farmers' awareness of water saving in Syria.

4) Local characteristics of economy, society and culture were taken into consideration when preparing project design. It is recognized that farmers' awareness of water saving and needs of organization is depending upon the locality of farmers' mentality in addition to differences in the water resources (groundwater or surface water) and the kinds of crops irrigated.

5) Technical support to the engineers in neighboring countries, namely training for Iraqi engineers contributed to help them understand the effective extension systems as well as to give the Syrian counterparts self-confidence and incentive to further enlightenment. The achievement of the Project will function as a model for the similar projects in the Middle East region.