

## 付 属 資 料


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- 付属資料 2. PDM (2003 年 10 月改訂版。終了時評価時使用)
- 付属資料 3. PDM (和文)
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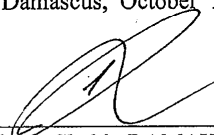
**MINUTES OF MEETINGS  
BETWEEN  
THE MINISTRY OF IRRIGATION OF  
THE SYRIAN ARAB REPUBLIC  
AND  
THE JAPANESE EVALUATION TEAM  
ON  
THE JAPANESE TECHNICAL COOPERATION FOR THE PROJECT  
ON  
ESTABLISHMENT OF WATER RESOURCES INFORMATION CENTER**

The Japanese Evaluation Team (hereinafter referred to as “the Team”), organized by Japan International Cooperation Agency (hereinafter referred to as “JICA”) and headed by Mr. Itsu Adachi, visited the Syrian Arab Republic from October 9 to October 20, 2004. The purpose of the Team’s visit was to evaluate jointly with the Ministry of Irrigation the achievement of the Japanese Technical Cooperation Program regarding the Project on Establishment of Water Resources Information Center (hereinafter referred to as “the Project”) based on the Record of Discussions, signed on March 11, 2002, by the Resident Representative of JICA in the Syrian Arab Republic and Authorities Concerned of the Government of the Syrian Arab Republic, and the Minutes of Meetings signed on October 23, 2003, by the Japanese Project Consultation Team and the Syrian Ministry of Irrigation (hereinafter referred to as “MOI”).

During its stay in the Syrian Arab Republic, the Team exchanged views and had a series of discussions about the evaluation of the Project with Syrian Authorities Concerned. In the course of the evaluation, MOI expressed their gratitude to the technical support of the Japanese Government. As a result of the discussions, both sides mutually agreed upon the matters referred to in the document attached hereto.

Damascus, October 19, 2004

  
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ATTACHED DOCUMENT

JOINT EVALUATION REPORT  
ON  
THE PROJECT  
ON  
ESTABLISHMENT OF WATER RESOURCES INFORMATION CENTER  
IN  
THE SYRIAN ARAB REPUBLIC

October 19, 2004



## LIST OF ABBREVIATION AND ACRONYMS USED

C/P	Counterpart Personnel
DAWSSA	Damascus City Water Supply and Sewerage Authority
EOJ	Embassy of Japan
GDBAB	General Directorate of Barada-Awaj Basin
GDCB	General Directorate of Coastal Basin
GES	General Establishment of Survey
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
JICA	Japan International Cooperation Agency
M/M	Minutes of Meetings
M/M	Man Month
MOI	Ministry of Irrigation
OJT	On-the-Job Training
PDM	Project Design Matrix
PO	Plan of Operation
R/D	Record of Discussions
SP	Syrian Pound
SPC	State Planning Commission
WRIC	Water Resources Information Center

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## 1. INTRODUCTION

### 1-1 Purpose of Evaluation

The purposes of the Joint Final Evaluation on the Project are

- (1) to verify the achievements of the Project compared to those planned (achievements of inputs, outputs and the Project purpose);
- (2) to evaluate the Project based on the five evaluation criteria (Relevance, Effectiveness, Efficiency, Impact and Sustainability); and
- (3) to make recommendations for the actions to be taken in the future.

### 1-2 Schedule of the Team

The meetings of the Joint Evaluation Committee were held from October 3 to 19, 2004. In the evaluation process, the Committee members interviewed and discussed with the governmental authorities and institutions relevant to the execution of the Project, including the Ministry of Agriculture and Agrarian Reform, the Ministry of Housing and Construction, and the Damascus Water Supply and Sewage Association (hereinafter referred to as "DAWSSA"). The detailed schedule is attached as 'ANNEX 1-2'.

### 1-3 Evaluators

The evaluation and the recommendations on the Project were done by the following members, which forms the Joint Evaluation Committee (hereafter referred to as "the Committee").

#### 1-3-1 Syrian Side

##### *Ministry of Irrigation*

H.E. Eng. Nader Al-Bunni  
Dr. Eng. Solima Ramah  
Dr. Jamil Fallouh  
Eng. Husein Makhoulouf  
Eng. Jamal Jamaledin  
Eng. Fareed Turk  
Eng. Mkhatar Al-Dana  
Dr. Bachar J. Faiad  
Eng. Ahmad Abdullah  
Eng. Abdulhakim H. Boissa  
Mr. Noriyuki Mori  
Mr. Atsushi Suzuki  
Mr. Izumi Kato  
Mr. Hideaki Umeda

Minister of Irrigation  
Deputy Minister for the Technical Affairs  
Director, General Directorate of Barada-Awaj Basin  
Director, General Directorate of Coastal Basin  
Director of Training, Research and Information  
Director of Planning  
Directorate of Training, Research and Information  
Director of WRIC, Main Center  
Director of WRIC, GDBAB  
Director of WRIC, GDCB  
JICA Expert, Chief Advisor of WRIC  
JICA Expert, Hydrologist, WRIC  
JICA Expert, Total System Management, WRIC  
JICA Expert, GIS/Database Management, WRIC

Mr. Nobuo Sugiura

JICA Expert, Coordination, WRIC

### **1-3-2 Japanese Side**

#### ***Japanese Evaluation Team***

Mr. Itsu Adachi

Leader of the Final Evaluation Study Team

Mr. Yoshio Matsuda

Water Resources Management/ Chairman of the  
Advisory Committee

Mr. Hisao Ushiki

Water Resources Management in Middle East/Member  
of the Advisory Committee

Ms. Izumi Shoji

Evaluation Planning

Ms. Ayako Namura

Evaluation Analysis

### **1-4 Methodology of Evaluation**

The Project was evaluated based on the Project Design Matrix (hereinafter referred to as "PDM") of this Project. The PDM is a summary table describing the outline of the Project. The evaluation for this Project refers to the PDM which was revised and agreed by both Syria and Japanese sides in October 2003.

#### **1-4-1 Evaluation Procedure**

The Team developed the evaluation grid which identified the specific evaluation points and the data collection methods. For the data and information collection, the Committee applied various methods such as the questionnaire, the interview, the workshop, and the observation of the observatory stations and the counterparts' demonstration on site. The Committee analyzed and evaluated the Project from the viewpoint of the achievement level of the Project, the implementation process, and five evaluation criteria such as Relevance, Effectiveness, Efficiency, Impact and Sustainability. Finally, the Committee made the recommendations and drew the lessons learned from the results.

#### **1-4-2 Points for the evaluation**

##### ***Achievement level and Implementation Process of the Project***

The achievement level in terms of Inputs, Activities, Outputs, and Project Purpose was assessed in comparison with the Record of Discussion (hereafter referred to as "R/D"), the PDM and the Plan of Operation (hereafter referred to as "PO"). The implementation process of the Project was also confirmed from the various viewpoints.

##### ***Evaluation Criteria***

The following five evaluation criteria are applied to the project evaluation.

- (1) Relevance: Relevance of the Project was considered from a viewpoint of the validity



of the Project Purpose and Overall Goal in connection with the development policy of the Government of Syria and the needs of beneficiaries of the Project.

(2) Effectiveness: Effectiveness whether the Project has actually benefited the target group and whether the project is effective. It also assesses whether the Project Purpose is being achieved as expected and whether that is in the result of the project's Outputs.

(3) Efficiency: Efficiency verifies whether the project was efficient in terms of effective use of resources. The relationship between Inputs and Outputs is reviewed. In essence, Efficiency examines whether the input cost is appropriate for the degree of achievement on the Outputs and the Project Purpose and whether other means would have been more efficient than the current project.

(4) Impact: Impact examines the indirect effects and extended effects by the project in the long run. The analysis also includes the positive and negative impacts that were not expected when the project was planned.

(5) Sustainability: Sustainability of the Project was focused on institutional, financial and technical aspects by examining the current extent to what the achievement of the Project is sustained or expanded.

#### **1-4-3 Sources of information used for Evaluation**

The sources of information used for this evaluation are as follows:

- The Record of Discussion (R/D) signed by the Authorities concerned of the Government of Syrian Arab Republic and JICA on March 11, 2002:
- The Minute of Meetings between the Japanese Project Consultation Team and the Ministry of Irrigation of the Syrian Arab Republic, October 2003:
- The PDM (ANNEX 1-3):
- The records of inputs and outputs from the Japanese and Syrian sides and activities of the Project:
- The questionnaires distributed to the Japanese experts and the Syrian authorities/counterparts concerned:
- Interview with Japanese experts and the Syrian authorities/counterparts concerned:
- The observation at the observatory stations in Syria: and
- The information collected in the workshop on Implementation Process.

## 2. BACKGROUND AND SUMMARY OF THE PROJECT

### 2-1 Background

Since 1960, Syria has implemented water resources development and water management programs to meet the increasing demand for water that has resulted from economic development and population growth. Despite such efforts, however, the problems of water shortage and water pollution have been aggravated during the past ten years due to a lack of adequate water resources management and to a decrease in the rate of precipitation. For the Syrian government, the establishment of a new water resources development plan has become the prime objective in resolving these serious water problems.

In August 1996, the Japan International Cooperation Agency (JICA) conducted "The Study on Water Resources Development in the Northwestern and Central Basins of the Syrian Arab Republic (PHASE I)" (hereinafter referred to as the "JICA development study [Phase I]") in response to a request from the Government of Syria. The purpose of the study was to prepare a master plan for the comprehensive development of water resources in the areas of five water basins: Barada-Awaj, Orontes, Coastal, Aleppo, and Steppe. JICA also conducted "The Study on Water Resources Development in the Northwestern and Central Basins of the Syrian Arab Republic (PHASE II)" (hereinafter referred to as the "JICA development study (Phase II)") as a feasibility study for priority projects.

Based on the results of these studies, the Government of Syria requested the Government of Japan to provide project-type technical cooperation for the establishment of Water Resources Information Center (WRIC) in order to help it improve water resources information management throughout the country, and develop decision-makers that can utilize water resources information. Short-term Japanese experts were dispatched and three preparatory studies were conducted to work out the scope of the Project.

These studies indicated that the Ministry of Irrigation (MOI), which is the agency responsible for water resources development and management, could not pursue its responsibilities properly due primarily to a lack of accurate and reliable water resources information based on precise hydrological and meteorological observations. It was also recognized that the absence of accurate water resources information is derived mainly from: (i) insufficient hydrological and meteorological observation facilities, (ii) poor observation skills, (iii) inefficient information transmission between the MOI headquarters and the General Directorates, (iv) inadequate information sharing among water-related agencies, (v) inappropriate data saving, and (vi) insufficient information processing skills.

In order to solve these problems in the water resources management sector of Syria, the Government of Japan formulated the Project for the establishment of Water Resources Information Center. Cooperation activities included improvement of basic meteorological and hydrological observation skills and establishment of computer systems for the Barada-Awaj Basin and the Coastal Basin, which are areas having the highest priority. Both

sides discussed and signed the Record of Discussions on March 11, 2002, and started 'the Project on the Establishment of Water Resources Information Center in Syrian Arab Republic' on June 15, 2002.

JICA dispatched the Japanese Project Consultation Team to the Syrian Arab Republic from October 18, 2003 to October 24, 2003 for discussing with the MOI technical and administrative matters regarding the Project and both sides agreed to revise the PDM and the PO in view of the Project's progress and situations around the Project.

In June 2005, about eight months before the cooperation period of the Project ends, JICA dispatched the Japanese Evaluation Team to evaluate the Project jointly with the MOI.

## **2-2 Summary of the Project**

The master plan was prepared in the Minutes of Meetings (M/M) signed on May 11, 2002, and was revised by the M/M signed on October 23, 2003. The summary of the Project is shown below.

### **(1) Objective of the Project**

#### **1) Long Term Goal**

To achieve integrated and sustainable water resources management in the whole basins of the Syrian Arab Republic.

#### **2) Overall Goal**

To achieve integrated and sustainable water resources management in the Barada-Awaj Basin and the Coastal Basin.

#### **3) Project Purpose**

To establish a center enabling appropriate management of water resources information.

### **(2) Output of the Project**

1) A water resources information system (hydrological and meteorological observation stations, computer system, and computer network) is established at Main Center and two Basin Centers of WRIC.

2) The staff of WRIC acquires the necessary techniques for hydrological and meteorological observation, data collection, and data processing.

3) A section is established within WRIC for capacity building, and continuous human resources development is conducted

4) A section is established within WRIC to maintain the water resources information system, and the continuous maintenance is conducted.

5) A system is established to enable the staff of WRIC to provide necessary information on water resources management to decision-makers, planners and researchers by utilizing the water resources information system.

(3) Activities of the Project (Refer to the PDM: ANNEX1-3 for details)

### 3. ACHIEVEMENT OF THE PROJECT

#### 3-1. Actual Input

*Inputs from the Japanese side* - as of October, 2004

(1) Long-term experts (ANNEX 2-1)

A total of five (5) long-term experts were dispatched in the fields of Chief Advisor, Hydrologist, and Coordinator (total 82.5MM [man month], and it will amount to 106.5 MM by the end of the project).

(2) Short-term experts (ANNEX 2-1)

A total of fourteen (14) short-term experts have been dispatched (total 74.5 MM, and it will be amount to 79.4 MM by the end of the Project.)

(3) Counterpart training (ANNEX 2-3)

Twenty-six (26) counterparts were accepted for training in Japan as of October 2004 (total 19.2 MM).

(4) Provision of Machinery and Equipment (ANNEX 2-4)

Machinery and equipment amounting Japanese USD 747,887 (approximately JPY 81,707,000) was provided as of October 2004. (The exchange rate: USD 1 = JPY 109.25, as of October 17, 2004)

(5) Operation expenses of the project (ANNEX 2-5)

USD 109,022.84 (approximately JPY 11,910,763) was provided as of September 2004.

(The exchange rate: USD 1 = JPY 109.25, as of October 17, 2004)

*Inputs from the Syrian side*

(1) Counterpart personnel assigned for the Project (ANNEX2-2)

A total of seventy-nine (79) personnel<sup>1</sup> were assigned as of October 2004.

Main Center: 18 personnel

GDBAB: 26 personnel

GDCB: 35 personnel

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<sup>1</sup> The number of counterpart personnel excludes the workers and drivers.

(2) Provision of facilities and equipment

The followings were provided by the Syrian side.

- Headquarters of WRIC, including the office space for Japanese Experts
- Existing monitoring facilities and equipment

(3) Project Implementation Cost (ANNEX 2-5)

Total of 51,339,315 Syrian Pounds (approximately JPY 104,732,203) were provided.

(The exchange rate: SP 1 = JPY 2.04, as of October 17, 2004)

**3-2. Accomplishment of Activities**

Overall, the activities of the Project have been carried out to date. Although the delay of the activities affected the project progress to some extent, most of the activities are likely to be completed by June 2005. The degree of accomplishing each activity at the time of terminal evaluation is summarized in ANNEX 5.

**3-3. Achievement of Outputs**

The achievement level of each Output is shown below. The detailed information is included in the Evaluation Grid attached (ANNEX 6).

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Output 1:	A water resources information system (hydrological and meteorological observation stations, computer system, and computer network) is established at Main Center and two Basin Centers of WRIC.
Indicators:	(1) Observation equipment is installed and exact observation is carried out at these observatories (2) In three centers, inputs the available data to Database and outputs of available data, such as a table accumulated and needed for a database, graph, and a map, are attained (3) In three centers, exact information is transmitted periodically

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(It should be noted that Output 1 targets nine observation stations of the Project.)

Overall achievement level of output 1 is good. As of the terminal evaluation, the rate of operating stations nearly 80%, because two pieces of equipment of the ground water level recorders among nine (9) JICA training observation stations were under repair<sup>2</sup>. However, it should be noted that this rate will become 100% after the complete repair of two broken equipment. The data of the observation stations has been collected as planned and the counterparts in Data Collection and Classification Sections at two Basin Centers acquired the basic skills to observe the data from the observation equipment to date. The database was developed although the Project confronted the difficulty in changing the database

<sup>2</sup> Seven (7) pieces of equipment are working out of nine (9).

software from ORACLE to PostgreSQL due to the Economic Sanction Law imposed by the USA. Currently it is available to output the materials such as tables, graphs or maps from the database. The data transmission became available between the Main Center and two Basin Centers through ISDN line and the data transmission has been carried out weekly. Since the original plan of the Project did not intend to utilize ISDN line, this achievement level is very high. In sum, the water resource information system was established at Main Center and two Basin Centers of the WRIC as planned.

Output 2:	The staff of the WRIC acquires the necessary techniques for hydrological and meteorological observation, data collection, and data processing
Indicators:	(1) To collect and process meteorological and hydrological data periodically (Observation activity is conducted continuously and accurately at stations in two Basins, and the rate of operating stations is over 80%) (2) Observation data in the database is accumulated periodically (3) To prepare periodical report

(It should be noted that Output 2 targets nine training observation stations of the Project and other stations responsible for the Ministry of Irrigation and other agencies in the Barada-Awaj Basin and the Costal Basin. It will be approximately 700 stations.)

Output 2 is likely to be achieved by June 2005; however some more works should be completed in the remaining period to ensure the degree of achievement.

Observation activity has been conducted continuously. The rate of operating stations which belong to the MOI<sup>3</sup> is 97.1% as of June 2004. Likewise, the rate at GDBAB is 97.5% and that at GDCB is 96.6%. Therefore those rates satisfied the goal of 80% set up as an indicator. The data input to the database has been continuously conducted. The data which belongs to the MOI was inputted to the database already. The Data books have been produced by utilizing the database. However, the data accuracy still needs to be improved. The data obtained from the concerned ministries such as precipitation data from the Ministry of Defense is in the process of data entry.

The Monthly Reports have been produced regarding nine (9) JICA training stations. The annual record of surface water and ground water for 2001-2002 was produced through Excel, and that for 2002-2003 is in the process of production by utilizing the database. In addition, the Register Book of Observation Stations was prepared regarding approximately 800 observation stations in GDBAB and GDCB. The preparation of the Water Resources Report will be started in November 2004.

In sum, the staff of the WRIC acquired the basic techniques for hydrological and meteorological observation, data collection and data processing. The remaining task is to

<sup>3</sup> Since the Project cannot ensure the rate of observation at the station for all 700 stations, this targets only 480 stations which belong to the MOI.

improve the accuracy of the observed data focusing on (1) enhancing the ability to identify the error factors of the observed data (the patterns of errors occurred) and the skills how to obtain the correct data, (2) enhancing the check-up system by putting the data flow system into practice firmly, and (3) enhancing the ability of finding discrepancy through visualizing the data or making the graphs.

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Output 3: A section is established within the WRIC for capacity building, and continuous human resources development is conducted

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Indicators: (1) To prepare guidelines for guidance  
(2) To conduct training by Syrian side

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Output 3 almost fulfilled its goal but there are some more points which should be emphasized to ensure its achievement level.

To date, twenty-five (25) different manuals were prepared in the Project and the technical glossary book was produced in Arabic. The training programs on the database and GIS have just started by the Syrian counterparts in September 2004.

In the remaining period, the Project needs to ensure that the original sets of the manuals be kept in the bookshelf and be available to refer for every staff members, whenever they need to refer to the manuals. The guarantees for the equipment also have to be stored properly. It may be good if the manuals are utilized for preparing the training materials by the counterparts.

As for the training, it is necessary to discuss what kinds of OJT, workshop or trainings should be provided for the WRIC staff. To ensure the continuous human resource development, it is very important to make a plan of the capacity development at the WRIC, specifying the necessary inputs such as the specialties/areas and the terms of the Japanese Experts, and this plan should be submitted to JICA before January 2005. It is also necessary to give the feedback of the results of the trainings by producing the reports on trainings.

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Output 4: A section is established within the WRIC to maintain the water resources information system, and the continuous maintenance is conducted

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Indicators: (1) Appropriate operation do and system down time is less than 10% of total working hours  
(2) Observation activities is conducted continuously and accurately at stations in two Basins, and the rate of operating stations is over 80%

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For the network and the database systems, the operation and maintenance activities have been carried out as planned. The operation and management reports are submitted to the Management Committee every two weeks. The counterparts are likely to acquire the basic skills of daily maintenance. The time of system down was 11% of the total working hours on average from October 2003 to September 2004, which was close to the target of 10% of the total working hours.

The status of operation and maintenance of the equipment seems to be good by verifying the indicator set in the PDM. Moreover, the operation and maintenance process for observation equipment was already defined and the activities have been conducted. However, the minor mistakes<sup>4</sup> were found by the Committee during the observation. Therefore, the Project needs to enhance the operation and maintenance system more firmly.

To ensure the achievement level of Output 4, the following points may be emphasized.

- (1) System Maintenance: The maintenance work should become routine at the centers. The counterparts need to make sure that they can deal with the troubleshooting internally and procure the spare parts timely. Since the system maintenance of the hardware and the software is contracted out, the WRIC needs to carefully assess if this outsourcing works well.
- (2) Operation and maintenance of observation equipment: The Project is currently planning to prepare the format for maintenance (such as a checklist) and to produce the Operation and Management Report. It is necessary to put these tasks into practice at the WRIC. Moreover, it was recognized that the more training on the operation and maintenance at GDCB<sup>5</sup> should be necessary to provide. In this respect, some options may be taken: the staff of Main Center provides the training for the staff of GDCB, or the WRIC requests the manufacturing company, such as SEBA, to provide the OJT on the operation and maintenance to the staff of GDCB.

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Output 5: A system is established to enable the staff of the WRIC to provide necessary information on water resources management to decision-makers, planners and researchers by utilizing the water resources information system

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Indicator: (1) Monthly reports of water resources information are submitted to decision-makers periodically

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The Monthly Reports regarding nine JICA training stations were already published. These reports have been distributed to the Minister, the Vice Minister of Irrigation, and concerned Basin Directorates. Moreover, the hydrological data are published on the web site of the WRIC.

To ensure the achievement of this Output, the Project may consider more utilization of the Monthly Report as Public Relations (PR) for the WRIC. It is also better to establish the delivery system of the Monthly Reports to the concerning ministries, the other basin

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<sup>4</sup> For example, the battery for the logger is dead but not replaced timely, or the workers did not fully understand the data item shown on the monitor of the equipment.

<sup>5</sup> Because GDBC is located far from Damascus City and the companies which can provide the maintenance for the equipment do not exist around the Coastal Basin Center, it is difficult for them to obtain the quick services for maintenance. Therefore, the staff of GDBC needs more training to ensure the operation and maintenance of the equipment.



directorates/centers, and the donors.

Some more works are required to the Project to fulfil Outputs for the remaining eight months. By the end of 2004, 248 new sets of equipment will be installed by the Grant Aid. This means that the Project has to cope with the loads of data which will be obtained from those sets of equipment. Considering this point, the Committee identified some points which would be necessary to carry out:

- To adjust the data collection and the data process system considering new data obtained from new equipment:
- To revise the data items on the database considering new data obtained from new equipment:
- To ensure that the counterparts receive the trainings for calibration of the equipment: and
- To revise the contents of the Monthly Report, incorporating the data obtained from new equipment and to publish it on the web site of the WRIC.

#### **3-4 Achievement of Project Purpose**

The Project Purpose, "to establish a center enabling appropriate management of water resources information" is likely to be achieved to some extent. Specifically, the first publication of the annual record of Hydrology for 2001-2002 was published and the second publication of the annual record for 2002-2003 is in the process of production at the terminal evaluation by utilizing the database developed in the Project. Therefore, it is certain that this will be achieved by 2005 and the Project will establish the basic system to publish the hydrology records annually by the end of the cooperation period.

The first publication of the Water Resources Report for two basins is currently at the preparation stage as planned. The workshop will be held in November 2004 in which the options of the data outputs will be presented to the policy-makers and the contents of the report, namely what kinds of outputs and points should be included in the report, will be discussed. Based on the result of the workshop, it is necessary to make a specific activity plan to produce the Report until June 2005. The detailed steps and a specified period of time should be included in the plan and the expected level of the report should be determined. In short, it is certain that the Project produce the first publication of the Water Resources Report by the end of the cooperation period. For the future, the quality of the Water Resources Report should be upgraded year by year.

#### 4. EVALUATION

##### 4-1 Relevance

Overall, it is judged that the Relevance of the Project is very high. The details are as follows.

##### *Relevance of the Project for Syrian government's policy*

Syrian government's policy on water resources was stipulated in the Ninth Five-year Development Plan (2001-2005). It refers to the effective use of limited natural resources (such as cultivated land, water and oil) and identifies it as an important agenda for national economic development. Moreover, the Plan, in the section of Water Activity, refers to the necessity to prepare the water map for the country to facilitate definition of water resources and to apply modern technologies and program such as GIS in the study and documentation of water networks. These indicate that the importance of water resource management is clearly recognized in Syria. Therefore, the Long-term Goal, Overall Goal, and the Project Purpose are still consistent with the Syrian government policy.

##### *Relevance of the Project for the target areas*

The selection of target areas in this Project was appropriate. As the Project Documents in March 2003 explained, the number of Centers selected as the target of the Project was appropriate considering the limited time and budget of the technical assistance, rather than targeting the entire country. The selection of the Barada-Awaj Basin and the Coastal Basin were also appropriate. The Barada-Awaj is located in Damascus where the water balance is in emergent situation and the government needed to closely monitor the water balance in this area. On the other hand, the Coastal Basin area has relatively rich water resources and its surplus water is expected to utilize in other drought areas in the future. Therefore, the water resource information in this area is very significant. Also the Coastal Basin can be a test case when expanding the Project nationwide.

##### *Relevance of project planning*

Considering that a project has time limitation, the appropriate setting of a project purpose should be carried out carefully. This Project, as described later, confronted many difficulties which stemmed from the unsatisfaction of Pre-project obligations<sup>6</sup> and the occurrence of the external factors (in PDM, this is called as Important Assumptions). Therefore, the careful attention and analysis of how the pre-condition and the external factors affect the

<sup>6</sup> Pre-project Obligations set in the PDM are, "(1) the Syrian side will collect historical data according to the format designed by the Syrian and Japanese sides, and (2) the MOI will collect necessary data on water resources and water demand from related agencies for input the database of WRIC before the start of the Project."

Project at the planning stage as much precise as possible. On top of that, it is important to analyze whether it is necessary to incorporate the external factors into the Project activities to achieve the project purpose within the cooperation period.

#### 4-2 Effectiveness

Based on the achievement of the Outputs and the Project Purpose stated in "3. Achievement," the Project is likely to fulfil its purpose by the end of the cooperation period. However, the Project did not specify the quality<sup>7</sup> of the documents which are produced by the Project. When the quality aspect is taken into consideration, it can be assessed that the Project needs more works to reach the expected results. At this point, the overall effectiveness of the project is not likely to be high as it is expected.

The factors inhibiting the effectiveness of the Project are analyzed as follows:

- 1) Not sufficient number of the qualified counterparts was assigned timely,
- 2) The working conditions in Syria would not promote the motivation of some of the staff members at the WRIC. This affected the progress of the activities and limited the level of the technical transfer to the counterparts,
- 3) Converting the Input/Activities to Outputs was not likely to be efficient due to the delay of the progress of project activities. This substantially affected the achievement level of the Outputs (refer to "Efficiency"), and this also affected the achievement level of the Project Purpose.

It is certain that the achievement of Outputs will contribute to fulfilling the Project Purpose<sup>8</sup>. This means that the logic of the project design is appropriate, and all five Outputs of the Project are substantial to achieve the establishment of a center enabling appropriate management of water resources information.

Although the Committee identified several inhibiting factors, the positive aspect of the Project was also recognized: the key personnel of the Project such as the Directors of the WRIC, and the section leaders at three centers fully understand the significance of the Project and the roles of the WRIC in the water sector in Syria.

#### 4-3 Efficiency

Most of the inputs except assignment of the counterpart were delivered timely, and the amount and the quality of inputs are assessed as appropriate. To share the information and to check the progress of the Project, the Management Committee is held every other week,

<sup>7</sup> This means that the PDM did not mention the extent (level) to which the documents produced by the Project should be satisfied in terms of the kinds of outputs (tables, graphs, maps) or the writing and analytical skills.

<sup>8</sup> According to the interview with the counterparts and the Japanese experts.

and the weekly meeting at the Main Center is also held. However, overall efficiency of the Project is assessed as low because of the occurrence of the following external factors.

**(1) Unsatisfied Pre-project obligation**

Two Pre-project Obligations were set in the PDM as “(1) the Syrian side will collect historical data according to the format designed by the Syrian and Japanese sides, and (2) the MOI will collect necessary data on water resources and water demand from related agencies for input the database of the WRIC before the start of the Project.” These were not satisfied before the project started (except GDCB). This means that the Project had to cover this condition in the project activities, resulting in the delay of the progress of the project implementation and lowering the project efficiency.

***The detailed issues regarding the Pre-project Obligation:***

1) Obtaining the agreement of obtaining the data with the concerned ministries took time. At first, obtaining the digital map from General Establishment of Survey (GES) took one and half years because the information of map is considered as the top confidential matter in Syria. This hampered the activity to develop the digital map on GIS. Secondly, making an agreement to share the meteorological data with the Ministry of Defense took one and half years. This enormously affected the work on the data input into the database, and the digitalizing data is still in process.

2) Inaccuracy and inconsistency of the historical data

Many historical data, which had to be digitalized, contained the problems: the ID of the stations was not clearly defined (for example, one ID had the different coordinates), the units of data were not consistent, and one ID had several different figures on one parameter. Therefore, sorting out this problem took more time than expected.

**(2) Influence of the External Factors (Important Assumption)**

One of the Important Assumption of “Trained technical staffs stay in the WRIC” affected the progress of the project activities. From October 2003<sup>9</sup> to date, the staff members who were expected to be the core members and to transfer the acquired skills to other counterparts were resigned or transferred to other organizations or sections. This influenced the project progress and limited the level of technical transfer to the counterparts. Furthermore, due to the frequent turnover of the counterparts, the Project had to provide the trainings for the new staff members from the beginning. This hampered the project progress and lowered the efficiency of the Project.

<sup>9</sup> This was the time that the Minute of Meeting between the Japanese Project Consultation Team and the Ministry of Irrigation of the Syrian Arab Republic was signed and it stipulated to allocate the sufficient number of the counterparts.

***(3) The US Economic Sanction Law was imposed on Syria (Syria Accountability Act: SAA, signed by the President of the USA on December 2003)***

Due to this sanction, the Operation System for the database and the database software had to be changed, resulting in the delay of completing the database development. This affected the project progress enormously. Moreover, some procured materials such as ORACLE software and ArcSDE (connection software for ORACLE) are not in use due to this sanction law.

***(4) Procedure of the budget execution***

Because of the administrative reasons, the delay of the budget execution inhibited the smooth project implementation, although the Project made efforts toward solving this problem. Some examples of the influence of this matter were that the Project could not arrange the sufficient number of vehicles, could not purchase the fuel for the vehicle to go to the observation stations, or could not procure the necessary consumable goods such as the A0 printer or stationeries.

***(5) Monitoring the project activities***

The Project held various kinds of meeting among concerned personnel and shared the information and the project progress. These approaches were very effective to monitor the activities. In addition, it would be better if the Project breaks down each activity stated in the PDM into more detailed level and specifies the milestones/check-points of each activity setting the solid deadline. This could make the linkage clear among the activities, since many of them are deeply interrelated in the Project.

**4-4 Impact**

As of the terminal evaluation, it is expected that the realization of the Project Purpose will certainly lead to fulfilling the Overall Goal<sup>10</sup> and the Long-term Goal<sup>11</sup> in the future. Especially the Ministry of Irrigation has intention to expand the activities of the WRIC to other five basins in next five years and this is one of the expected impacts of the Project. On the other hand, it may be still premature to prospect the concrete achievement level of Overall Goal. Therefore, it is good if the Project will redefine the expected goal more specifically before the Project is ended. The focusing point would be how the information provided by the WRIC will be utilized for the decision-making in the water policy.

According to the interview with the director level of the WRIC, the internal impact was

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<sup>10</sup> Overall Goal: To achieve the integrated and sustainable water resources management in the Barada-Awaj Basin and the Coastal Basin.

<sup>11</sup> Long-term Goal: To achieve integrated and sustainable water resources management in the whole basins of the Syria Arab Republic.

observed: through the Project, the team work among the Syria counterparts has been built up. To develop the concrete data flow, three sections such as the Data Collection and Classification Section, the Analysis Section, and the Technical Support Section have to cooperate one another. This promoted the team work building which was not recognized before the Project.

Another impact was that other donor showed the interest in the information system that the Project developed. According to the related document, GTZ and Syria agreed to cooperate in the field of Integrated Water Resources Management in the Aleppo Basin focusing on the policy study of water resources. The cooperation contains the assessment of relevant data for water resource management. GTZ visited the WRIC and mentioned that it would apply for the WRIC database system in their project.

#### **4-5 Sustainability**

##### ***Institutional Aspects***

The institutional sustainability is likely to be secured. The restructuring of government ministries and agencies is planned in next year. Under the new structure, the agency named as "the Ministry of Water Resources and Land" is planned to be established integrating all water-related agencies. It is certain that the WRIC will take a significant role in the water resource management under the new structure, and there is also an idea that the Minister will supervise the WRIC directly. These are still under planning and the final decision has not been made as of the terminal evaluation. If this structure is confirmed and put into practice, it is certain that the position and significance of the WRIC will be substantially enhanced. Moreover, the Ministry of Irrigation acknowledged the importance of the WRIC roles in the water sector and the Tenth Five-year Plan for Economic and Social Development (2006-2010) seems to stipulate to expand the activities of the WRIC to five water basins in five years by allocating the budget of 500 million Syrian pounds. This will also promote the significance of the WRIC's existence.

In the latter half of the project period, the management of the WRIC has been improved and the ownership of the Syria side has been increased as well. Moreover, the internal coordination among three sections at the WRIC has been enhanced. Therefore, the institutional sustainability of the Project is likely to be secured in the future.

##### ***Financial Aspects***

It is expected to allocate the sufficient budget for the future activities of the WRIC itself, such as purchasing the spare parts of the observation equipment, and upgrading the hardware and the software of the network/database systems which are very costly. The Project concluded a contract with the local company on the system maintenance and this budget also should be secured in the future. Moreover, it is expected that the WRIC has support for the smooth budget execution to implement the activities efficiently.

### *Technical Aspects*

It is not certain whether the technical sustainability, at this moment, is likely to sustain in the WRIC after the cooperation ends. To date, the Project made remarkable progress: however there are some more works which need to be carried out to secure the sustainability of the Project. Those are to enhance the ability of analysis such as estimating the water balance, to enhance the capacity of operation and maintenance skills for the systems and the observation equipment, and to put the data flow system into practice firmly to improve the data accuracy. Furthermore, 248 of new observation equipment will be installed by the Grant Aid by the end of 2004. The WRIC also needs to adjust many activities and the established system to cope with the data obtained from new equipment installed by the Grant Aid.

## **5. CONCLUSION**

### **5-1 Results of Evaluation**

Since the Project started in June 2002, it confronted a lot of difficulties which hampered the project progress enormously. Both Syrian and Japanese sides have put substantial efforts to tackle these difficulties. In sum, the Project is likely to achieve its purpose by the end of the cooperation period if some more works are successfully promoted in the remaining eight months. In terms of the evaluation criteria, the Relevance of the project is very high, meaning that the Project was of great worth implementing. The Effectiveness of the Project is likely to be ensured: however the Project needs to consider the quality aspects of the outputs to promote its Effectiveness more. Through this Project, the internal team work has been promoted greatly and this is recognized as a positive impact of this Project. On the contrary, the Efficiency is relatively low due to the occurrence of the external factors. Since the Ministry of Irrigation recognizes the significance of the WRIC activities, it is expected that its sustainability be maintained in the future.

### **5-2 Recommendations**

The Joint Evaluation Committee carefully evaluated the achievements of the Project so far and estimated to what extent the Project will be able to achieve the Activities, the Outputs and the Project Purpose by the end of the Project's period (by June 14, 2005). The Joint Evaluation Committee consequently recommends that this Project should be extended in order to ensure the Project Purpose completely.

Before implementation of this evaluation, the Government of Japan received the request for the extension of the project period from the Government of the Syrian Arab Republic. Then, the Project shall report the more specific requirements of Japanese inputs to JICA by January 2005 (refer to the item (1) - 4) and 5)).

**(1) Subjects towards the end of the project period (by June 14, 2005)**

- 1) Since the equipment for 248 observatories will be installed by the end of December 2004 through the Grant Aid from the Government of Japan, the MOI counterparts and Japanese experts are requested to make sure that the new equipment in addition to the existing ones are operated and maintained, the accurate data is obtained from them, the data is classified appropriately, and the data flow system including the rule of data processing is revised to deal with the increased volume of data obtained from the new equipment.
- 2) To improve the accuracy for observed data, following three areas are suggested to the MOI counterparts and Japanese experts: a. Identification of errors at the field, b. Enhancement of check-up system of the data, c. Identification of discrepancy.
- 3) Since publishing the Water Resources Report is one of the indicators of the Project Purpose, it is very important to make a plan including the detailed steps and time frame to produce the first publication of the Water Resources Report by June 2005. At the Workshop to be held on November 4, 2004, the concrete items to be included in the first publication of the Water Resources Report should be discussed as scheduled and the specific steps toward publishing the Report should be determined.
- 4) It is recommended that the Project formulates the Detailed Plan of Input Requirement of Japanese side by January 2005, which will complement the request of the extension period submitted by the Government of the Syrian Arab Republic to the Government of Japanese. To improve the contents and the quality of the second and succeeding publications of the Water Resources Report, the capacity of MOI counterparts needs to be strengthened, especially in the areas around the analysis and report writing. Therefore, the Detailed Plan should include the following points: (i) the final results (what effects can be obtained as a result of the extension period), (ii) the necessary measurements or activities to develop the capacity of the WRIC staff to reach the final results, and (iii) specific areas or specialties which need to be strengthened for the WRIC staff.
- 5) When the MOI will move to the new building in Harasta which is now under construction and to be completed in May 2004, the preparation and the works for resettling will severely affect the Plan of Operation (PO) of the Project (namely, the progress of the Project Activities) and the future plan. The MOI and the Project should keep the close contact with the MOI concerning this matter. That is, the timing of completion of the building and a detailed plan of moving WRIC Main Center to Harasta should be confirmed, so as for the Project to rearrange the PO timely.



- 6) It is necessary to allocate the good amount of budget for operation and maintenance and execute the budget timely and smoothly.

**(2) Subjects after the completion of the project (after June 15, 2005)**

In case that the extension of the Project is approved by the Government of Japan, following issues are suggested to tackle in cooperation with Japanese experts.

- 1) To make sure the data accuracy obtained from the other ministries.
- 2) To monitor the operation and maintenance condition of equipment for observation and the software (the database and the OS) after starting the collection of loads of data from 248 of new equipment provided by Grant Aid of the Government of Japan.
- 3) To evaluate the first publication of the Water Resources Report and other activities of providing relevant information to the MOI and the researchers.
- 4) To enhance the contents and the quality of the Water Resources Report. That is, to improve the ability of analytical works including the analysis of water balance and the level of visualized materials including the maps outputted by GIS.
- 5) To operate, maintain, and develop the function of the WRIC, the necessary human resources and the budget should be allocated to the WRIC continuously.

**5-3 Lessons Learned**

The following points were identified as lessons learned from the result of evaluation.

**(1) Significance of project management and establishment of the monitoring system**

One of the key points to make the project successful is to establish the monitoring system and put it into practice. In this respect, the important point is to set up the milestones/check-points specifying the time frame in order to confirm the progress of the activities. It is also important to make sure the connection between the activities, meaning that in general, many activities are interrelated and the delay of one activity will affect the progress of other activity. Moreover, to monitor the progress of the activities, only checking the progress of the activities described in the PDM or the PO would not be sufficient because those descriptions are the chunk of the activities in many cases. Thus, it is better to break down the activities into the action level and set up the clear results of each action. This will make it easier to monitor the progress of activities.

**(2) Countermeasures to the occurrence of expected and unexpected external factors**

It is very difficult to predict the unexpected situation such as the US Economic Sanction imposed by the USA. In this case, when any indications of the external factors are recognized, it is better to make efforts to collect any related information or news as much as possible, to consider all the possibilities and to prepare for the worst. In addition, the conditions of the external factors may change at the start of the project compared with conditions when the PDM is formulated<sup>12</sup>. In this respect, it is important to check the condition of the external factors (including the pre-conditions) described in the PDM at the early stage of the project implementation. Moreover, the careful attention should be paid to whether other external factors which are not described in the PDM are emerging as well. When the changes of the external factors are recognized and the project judges that those will affect the project implementation, the PDM and the PO (the schedule of activities) needs to be revised. In some cases, the actions toward the external factors should be incorporated into the project activities.

**(3) Function of the Organization and its organizational status**

In this Project, the Water Resources Information Center (WRIC) was established under the direct supervision of the Minister. It is certain that this has promoted the significance of the Center's existence and increased its presence in Syria because of its positioning and the direct support from the Minister. Therefore, when an organization functions as a national center which deals with the integrated information and has a role of serving the information to all agencies, its position within the organization is very significant.

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<sup>12</sup> In this Project, as stated in "4-3. Efficiency," the Pre-project obligations of "(1) the Syrian side will collect historical data according to the format designed by the Syrian and Japanese sides, and (2) the MOI will collect necessary data on water resources and water demand from related agencies for input the database of WRIC before the start of the Project," were not satisfied and the Project had to incorporate these points into the Project activities.



ANNEX

ANNEX 1-1

List of Personnel Visited by the Committee

(Syrian Side)

**Ministry of Irrigation**

H.E. Eng. Nader Al-Bunni	Minister of Irrigation
Dr. Eng. Soliman Ramah	Deputy Minister for the Technical Affairs
Dr. Maamoun Malakani	Advisor to Deputy Minister
Dr. Jamil Fallouh	Director, General Directorate of Barada-Awaj Basin
Eng. Husein Makhlof	Director, General Directorate of Coastal Basin
Eng. Abd Allatif Mahmoud Ahmad	Director of Tartous Irrigation Branch, General Directorate of Coastal Basin
Eng. Jamal Jamaledin	Director of Training, Research and Information Directorate
Eng. Fareed Turk	Director of Planning Directorate
Mr. Tahr Haji Hassan	Director of Study Directorate
Ms. Fadia Abdel Nour	Director of Water Resources Directorate
Dr. Bassam Zakkar	Deputy Director of Water Resources Directorate
Eng. Mkhtar Al-Dana	Directorate of Training, Research and Information
Mr. Atief Dieb	Director of Water Quality Control Directorate
Eng. Sameer A. Hayfa	Vice Director for Technical Affairs, General Directorate of Coastal Basin
Dr. Bachar J. Faiad	Director of WRIC, Main Center
Eng. Ahmad Abdullah	Director of WRIC, GDBAB
Eng. Abdulhakim H. Boissa	Director of WRIC, GDCB
Geo. Nazeer Asmael	Manager of Data Collection and Classification Section, WRIC, Main Center
Eng. Ali Assad	Data Collection and Classification Section, WRIC, Main Center
Eng. Suad Obeid	Data Analysis Section, WRIC, Main Center
Eng. Yahia Tujjar	Manager of Technical Support Section, WRIC, Main Center
Eng. Andre Tohme	Manager of Technical Support Section, WRIC, GDBAB
Eng. Kassem Natouf	Manager of Data Analysis Section, WRIC, GDBAB
Eng. Bacheer Sawam	Manager of Data Collection and Classification Section, WRIC, GDBAB
Eng. Mohammad Sai	Manager of Data Collection and Classification Section, WRIC, GDCB
Eng. Mazen Maana	Manager of Data Analysis Section, WRIC, GDCB

Eng. Nazeeh Bourish                      Manager of Technical Support Section, WRIC, GDCB

**State Planning Commission**

Dr. M. Bassam Al-Sibai                      Deputy Head of State Planning Commission  
Mr. Nader Al-Sheikh Ali                      Director of International Economic Relations  
Department  
Ms. Ilham Morad                              International Economic Relations Department

**Ministry of Housing and Construction**

Dr. Kamal Al-Sheikha                      Vice Minister

**Ministry of Agriculture and Agrarian Reform**

Dr. Majid Jamal                              Director General, General Commission for Scientific  
Agricultural Research  
Dr. Daoud Ma'an Daniel                      Head of Water Resource Management Research  
Division, General Commission for Scientific Agricultural  
Research

**Damascus City Water Supply and Sewage Authority**

Eng. Khaled Al-Shalak                      Deputy General Director

**Prefecture of Lattakia**

Mr. Zahed Haj Musa                              Governor of Lattakia Prefecture

**Embassy of Japan**

Mr. Takeshi Okuda                              Second Secretary, Economic Cooperation

**JICA Syria Office**

Mr. Kazuhide Nagasawa                      Resident Representative of JICA Syria Office  
Ms. Reiko Funaba                              Assistant Resident Representative  
Mr. Sakher Mrishih                              Programme Officer, Water Resources and Agriculture  
Sectors

## ANNEX 1-2

## Schedule of Japanese Evaluation Team

Date		Schedule
October 3	Sun.	The consultant member of the Team visits WRIC in Dummar Interview and discussion with Director and Japanese experts
4	Mon.	The consultant member visits WRIC in Dummar, interview to staff GDBAB Workshop (group discussion)
5	Tues.	The consultant member visits GDBAB and GDBAB center Interview to GDBAB Director, GDBAB center Director and staff
6	Wed.	The consultant member move to Lattakia
7	Thurs.	The consultant member visits GDCB and GDCB center Interview to GDCB Director, GDCB center Director and staff
8	Fri.	Data analysis
9	Sat.	Three other members (Mr.Adachi, Mr.Ushiki, Ms.Shoji) arrive at Damascus
10	Sun.	Meeting with JICA Syria and EOJ at JICA Syria Courtesy call to Minister of MOI Courtesy call to SPC Meeting and discussion with Japanese experts
11	Mon.	Visit WRIC in Dummar, meeting and discussion with WRIC staff Meeting and discussion with Director of GDBAB, WRIC GDBAB Center Director and staff Observation of the observatories of WRIC GDBAB Center
12	Tues.	Discussion with MOI on the achievement of the Project
13	Wed.	Discussion on the First Draft of M/M Move to Lattakia Courtesy Call to the Governor of Lattakia Prefecture
14	Thurs.	Meeting and Discussion with Director of GDCB, WRIC GDCB Center Director and staff Observation of the observatories of WRIC GDCB Center Visit Tartous branch, Observation of an observatory of WRIC GDCB Center Tartous
15	Fri.	Move to Damascus via November 16 <sup>th</sup> Dam
16	Sat.	Mr.Matsuda arrives at Damascus
17	Sun.	Discussion with MOI on the M/M
18	Mon.	Visit Ministry of Agriculture, interview and discussion Visit Ministry of Housing and Construction, interview and discussion Visit DAWSSA, interview and discussion JCC at MOI
19	Tues.	Discussion on the M/M Signing on the M/M
20	Wed.	Report to EOJ Report to JICA Syria Report to Minister of MOI Leave Damascus for Tokyo

**ANNEX1 — 3 Project Design Matrix (PDM)**

Project name: Establishment of Water Resources Information Center

Project site : Damascus (Ministry of Irrigation)

Target area: The Barada-Awaj Basin and Coastal Basin.

Target group : Staff of Ministry of Irrigation, Water Resources Information Center,

General Directorate of the Barada-Awaj Basin,

General Directorate of the Coastal Basin

Project Period : June 15, 2002 to June 14, 2005

Date: Oct.23, 2003

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<p><b>Long Term Goal</b> To achieve integrated and sustainable water resources management in the whole basins of the Syrian Arab Republic.</p>			
<p><b>Overall Goal</b> To achieve integrated and sustainable water resources management in the Barada-Awaj Basin and the Coastal Basin.</p>	<p>1) Appropriate project designs are made in the Barada-Awaj Basin and the Coastal Basin. 2) Master plans for Water resources are made in the Barada-Awaj Basin and the Coastal Basin. 3) Reports for water balance in the Barada-Awaj Basin and the Coastal Basin are made.</p>	<p>1) Report of MOI 2) Master plan of MOI 3) Report of MOI</p>	
<p><b>Project Purpose</b> To establish a center enabling appropriate management of water resources information.</p>	<p>1) Annual records of Hydrology are published by the year 2005. 2) Water Resources Report for Barada-Awaj Basin and Coastal Basin is published by the year 2005. The water resources information system is in operation before the completion of the cooperation.</p>	<p>1) Annual records of Hydrology 2) Water Resources Report of MOI.</p>	<p>*MOI does not change the policy concerning the Establishment of WRIC. *Necessary budget is allocated to operate and maintain WRIC after established. *Trained technical staff stay in WRIC. *MOI will keep the staff (quality and quantity) at WRIC</p>
<p><b>Outputs</b> 1) A water resources information system (hydrological and meteorological observation stations, computer system, and computer network) is established at Main Center and two Basin Centers of WRIC.</p>	<p>1)-1 Observation equipment is installed and exact observation is carried out at these observatories. 1)-2 In three centers, inputs the available data to Database and outputs of available data, such as a table accumulated and needed for a database, graph, and a map, are attained. 1)-3 In three centers, exact information is transmitted periodically.</p>	<p>1)-1 Observation activity is conducted continuously and accurately at stations in the two Basins, and the rate of operating stations is over 95%. 1)-2 Data Book and Monthly report for precipitation, discharge, groundwater, water quality are prepared by using database. 1)-3 The data is transferred in three centers accurately</p>	
<p>2) The staff of WRIC acquires the necessary techniques for hydrological and meteorological observation, data collection, and data processing.</p>	<p>2)-1 To collect and process meteorological and hydrological data periodically 2)-2 Observation Data in the database is accumulated periodically. 2)-3 To prepare periodical report</p>	<p>2)-1 Observation activity is conducted continuously and accurately at stations in the two Basins, and the rate of operating stations is over 80%. 2)-2 Data book 2)-3 Periodical report</p>	
<p>3) A section is established within WRIC for capacity building, and continuous human resources development is conducted</p>	<p>3)-1 To prepare guidelines for guidance 3)-2 To conduct training by Syrian side</p>	<p>3)-1 Guidelines for guidance 3)-2 Report on staff training</p>	
<p>4) A section is established within WRIC to maintain the water resources information system, and the continuous maintenance is conducted.</p>	<p>4)-1 Appropriate operation do and system down time is less than 10% of total working hours. 4)-2 Observation activities is conducted continuously and</p>	<p>4)-1 Operation and management record on system 4)-2 Operation and Management Report on</p>	



**ANNEXI-3 Project Design Matrix (PDM)**

<p>5) A system is established to enable the staff of WRIC to provide necessary information on water resources management to decision-makers, planners and researchers by utilizing the water resources information system.</p>	<p>accurately at stations in the two Basins, and the rate of operating stations is over 80%.</p>	<p>observation equipment and observation stations</p>	
<p><b>Activities</b></p> <p>1)-1 To design equipment for Meteorological and hydrological stations</p> <p>1)-2 To install the observation equipment at the stations.</p> <p>1)-3 To conduct a basic design for computer system and install hardware and software such as OS at Main Center and two Basin Centers.</p> <p>1)-4 To design database and establish at Main Center and two Basin Centers.</p> <p>1)-5 To connect GIS with database systems at Main Center and two Basin Centers.</p> <p>1)-6 To establish network at Main Center and two basin Centers</p> <p>2)-1 To prepare a monitoring program of meteorological, hydrological, groundwater, water quality data in the Barada-Awaj Basin and the Coastal Basin.</p> <p>2)-2 To rehabilitate the hydrological and meteorological observation stations of the Barada-Awaj Basin and the Coastal Basin.</p> <p>2)-3 To get technique for observation and processing of observed data, etc. at two Basin Centers.</p> <p>2)-4 To collect and process meteorological and hydrological data</p> <p>2)-5 To input data to Database</p> <p>2)-6 To storage and maintenance plan for collected data</p> <p>2)-7 To prepare periodical report such as monthly report, annual records of Hydrology</p> <p>2)-8 To prepare periodical Water resources Report</p> <p>3)-1 To prepare guidelines for guidance of establishment of new basin center, capacity building plan, observation techniques, processing, processing technique of observed data, and information technology (IT), preparing several kinds of report, including annual hydrological report and monthly report.</p> <p>3)-2 To conduct training regularly for observation technique, information technology, and preparation of several kinds of report, by Syrian side</p> <p>4)-1 To conduct continuous operation and maintenance of Database and GIS</p> <p>4)-2 To conduct continuous operation and maintenance of network</p> <p>4)-3 To conduct continuous operation and maintenance of observation equipment.</p> <p>5)-1 To provide decision-makers with Water Resources Information</p>	<p>5)-1 Monthly reports of water resources information are submitted to decision-makers periodically.</p>	<p>5) Stock of Monthly reports.</p>	<p><b>Pre-conditions</b></p> <p>1) The Syrian Government does not significantly change its policy concerning water resources.</p> <p>2) Implementation of this Project is agreed upon by Syrian organizations that are concerned with water resources information management in Syria.</p> <p><b>Pre-project Obligations</b></p> <p>1) The Syrian side will collect historical data according to the format designed by the Syrian and Japanese sides. MOI will collect necessary data on water resources and water demand from related agencies for input into the database of WRIC before the start of the Project.</p> <p>2) The number of water resources monitoring points will not decrease. Significant decreases in the number of existing hydrological/meteorological stations in the two basins will not be allowed to hinder the implementation of the Project.</p>
<p><b>Inputs</b></p> <p><u>Syrian Side</u></p> <p>1. Personnel Assignment of Counterpart</p> <ul style="list-style-type: none"> <li>• Chief Advisor</li> <li>• Hydrologist</li> <li>• Coordinator</li> </ul> <p>2. Provision of facilities, equipment</p> <ul style="list-style-type: none"> <li>• Headquarter of WRIC, including the office space for Japanese Experts</li> <li>• Existing monitoring facilities and equipment.</li> </ul> <p>3. Project implementation cost</p> <ul style="list-style-type: none"> <li>• Recurrent cost for project.</li> </ul> <p><u>Japanese Side</u></p> <p>1. Dispatch of Japanese Experts</p> <ul style="list-style-type: none"> <li>• Long-term experts</li> <li>• Short-term experts (3 to 4 person per year)</li> </ul> <p>2. Counterpart Training in Japan (at least 3 person per year)</p> <p>3. Provision of equipment</p> <ul style="list-style-type: none"> <li>• Computers including network system</li> <li>• Computer software</li> <li>• Hydrological monitoring equipment</li> <li>• Vehicles</li> </ul>			

revised on August 16th, 2004

### List of Japanese Experts

	Name	2002 JFY												2003 JFY												2004 JFY												2005 JFY												Total													
		First Year												Second Year												Third Year												Fourth Year																									
		4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11																		
L o n g T e r m	Chief Advisor	Kazuhisa Ito	Plan	8/15												2y												6/14												6/14												3 years											
		Noriyuki Mori	Actual	6/15																								5/31												6/14												12.5 months											
	Hydrology	Takehiko Someya	Plan	6/15												2y																								6/14												3 years											
		Atsushi Suzuki	Actual	6/15																								8/16												6/14												10 months											
	Project Coordinator	Nobuo Sugiura	Plan	6/15												3y																								6/14												3 years											
			Actual	6/15																																				6/14												3 years											
S h o r t T e r m	Observation Equipment	Masahiro Tajima	Plan				2m																																																	2 months							
		Actual	9/4	10/28																																																											
	Data Processing	Yosuke Sasaki	Plan				3m																																																	3 months							
		Actual	9/4	11/27																																																											
	Ground Water Management	Masao Higuchi	Plan				3m																																																	3 months							
		Actual	6/25	9/19																																																											
	Hydrological Observation	Shigeaki Kihara	Plan				2.5m																																																	2.5 months							
		Actual	9/25	12/6																																																											
	Water Quality	Akira Kishi	Plan				3m																																																	3 months							
		Actual	3/26	6/16																																																											
W a t e r R e s o u r c e s P o l i c y	Water Resources Policy (1)	*	Plan				3m																																																	3 months							
		Actual																																																													
	Water Resources Policy (2) (Water Rights)	Katsuhiko Murose	Plan				0.5m																																																	0.5 months							
		Actual	5/24	5/28																																																	0.2 months										
	Water Resources Policy (3)	Yosuke Sasaki	Plan				0.5m																																																	0.5 months							
	Actual	5/24	5/28																																																	0.2 months											
Water Resources Policy (4)	*	Plan				3m																																																	3 months								
	Actual																																																														
C o m p u t e r S y s t e m E n g i n e e r	Total Computer System Engineer	Izumi Kato	Plan				1.7m		10/3		4.3m																																																	18.5 months			
		Actual	7/13	11/8		12/7		3/4		6/22		8/8		2/7																																																	17 months
	GIS and Management of Database (1)	Myo Thant	Plan				8m		1m		10/13		4m																																																	21.5 months	
		Actual	7/13	3/6		6/22		7/18		2/7																																																	13 months				
	GIS and Management of Database (2)	Fumio Kanayama	Plan				3.5m		4m																																																	6.5 months					
		Actual	9/15	12/26		6/22		10/16																																																	9.5 months						
GIS and Management of Database (3)	Hideaki Umeda	Plan				10/3		4.1m		2/6																																																	10.55 months				
	Actual	7/15	11/16																																																												
Management Network and System	Takeshi Sasahara	Plan				3.5m																																																	8.5 months								
	Actual	7/13	10/7		1/7		3/5		10/3		1/13																																																	12.5 months			

Date: arrival date in Syria and departure date of Syria

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Counterpart Personnel and Organization of WRIC (2004.08)								
Centre	Section	Name	Role in WRIC		Expertise	WRIC Assign.	Others	
Main Centre	Director	Bachar Falad	WRIC Manager	1	Hydrologist	Full time	PHD	
	Administrative Section	Maha Hassan	Translator	-	-	Full time		
		Bouhyna Soliman	Clerical Staff	-	-	Not Full		
		sub-total			2			
		Nazeer Ismail	Section Leader / (groundwater data)	-	-	Geologist	Full time	MS,Geology
		Ali Assad	Data collection & processing (surface water)	-	-	Civil Eng.	Full time	
		Shaher Abdullah	Data collection& processing (water facility)	-	-	Hydrologist	Full time	
		Safaa Al-Arab	Data collection& processing (meteorology)	-	-	Assistant Eng.	Full time	
		Faiza Ali	Data collection& processing (meteorology)	-	-	Assistant Eng.	Full time	
		Omran Al-Mohammad	Data collection& processing (water quality)	-	-	Assistant Eng.	Full time	
		Samr Jumaa	Data collection& processing(agriculture data)	-	-	-	Full time	
		sub-total			7			
	Analysis & System Management Section	Samr Al-rayes	Section Leader / GIS Engineer	-	-	Electrical Eng.	Full time	
		Suad Obaid	DB Administrator	-	-	Civil Eng.	Full time	MS, Environment
		Taghreed Al-Saleh	GIS Engineer	-	-	Civil Eng.	Full time	
		Kamal Shahada	Programmer	-	-	Electrical Eng.	Full time	
		Mamdouh Sakr	-	-	-	Civil Eng.	Full time	
	sub-total			5				
	Technical Support Section	Yahia Tujjar	Section Leader / Deputy Director / Sys. Men.	-	-	Civil Eng.	Full time	
		Ziad Wahab	System Maintenance	-	-	Mechanical Eng.	Full time	
	sub-total			2				
	Driver/ Workers	Misqel Bahsas	Driver	-	-	-	Full time	
		Maamoun Hag	Driver	-	-	-	Full time	
Yahia Abou Zied		Driver	-	-	-	Full time		
Fouad Al-Saleem		Worker	-	-	-	Full time		
Haltem Zareifah		Worker	-	-	-	Not Full		
sub-total				5				
Total				17+(5)				
GDBAB	Director	Ahmad Al Abdullah	WRIC Manager	1	Hydrogeologist	Full time		
	Administrative Section							
		sub-total			0			
	Data Collection and Classification Section	Basem Jammaz	Section Leader Data C&C	-	-	Geologist	Not Full	
		Moussa Fayad	Data collection& processing(groundwater)	-	-	Geologist	Full time	
		Yasin Toameh	Data collection& processing(groundwater)	-	-	Geologist	Full time	
		Mohamad Loppad	Data collection& processing(meteorology)	-	-	Geologist	Full time	
		Bashir Sawan	Data collection& processing(surface water)	-	-	Agriculture Eng.	Full time	
		Amir Alwadi	Data collection& processing(water facility)	-	-	Agriculture Eng.	Full time	
		Bashar Qanout	Data collection& processing(surface water)	-	-	Assistant Eng.	Full time	
		Abdi Fatah Horayzel	Data collection& processing(surface water)	-	-	Assistant Eng.	Full time	
		Ali Ghora	Data collection& processing(surface water)	-	-	Assistant Eng.	Full time	
		Abdi karim Khalil	Data collection& processing(groundwater)	-	-	Assistant Eng.	Full time	
		Ali Alail	Data collection& processing(groundwater)	-	-	Assistant Eng.	Full time	
		Mahmoud Almahmoud	Data collection& processing(surface water)	-	-	Assistant Eng.	Full time	
		Basim Hamoud	Data collection& processing(groundwater)	-	-	Assistant Eng.	Full time	
	sub-total			13				
	Analysis & System Management Section	Kassem Natouf	Section Leader / Deputy Director/DB Administrator	-	-	Hydrogeologist	Not Full	
		Nahada Fallouh	GIS Eng.	-	-	Civil Eng.	Full time	
		Qasim Shreydih	Data Analysis	-	-	Geologist	Full time	
		Wail al Najm	Data Processing	-	-	Assistant Eng.	Full time	
	sub-total			4				
	Technical Support Section	Andree Toume	Section Leader / System Man.	-	-	Electrical Eng.	Full time	
		Abdel Ghani Ajan	System Maintenance	-	-	Electrical Eng.	Full time	
		Khalid Makari	System Maintenance	-	-	Assistant Eng.	Full time	
	sub-total			3				
	Driver/ Workers	Hosni Laham	Workers	-	-	-	Not Full	
Zakaria Hejazi		Workers	-	-	-	Not Full		
Abdel Wahab Modatal		Workers	-	-	-	Not Full		
Abdel Latif Mayouf		Workers	-	-	-	Not Full		
Awad Al said		Driver	-	-	-	Not Full		
Hussein Najdalawi		Driver	-	-	-	Not Full		
sub-total			4					
Total				21+(4)				
	Director	Abdulhakim Bolssa	WRIC Manager	1	Civil Eng.	Full time		
	Deputy Director	Nimer Assad	Deputy WRIC Manager	1	Irrigation Eng.	Full time		
	Administrative Section (LATAKIA)							
		sub-total						
	Administrative Section (TARTOUS)	Ahmad Yousif	Head of Tartous Office	-	-	Hydrogeologist	Full time	
		sub-total			1			
	Data Collection and classification Section (LATAKIA)	Muhammad Sal	Section Leader (surface water)	-	-	Civil Eng.	Full time	
		Ansam Chareuf	Data collection& processing(administrator)	-	-	Civil Eng.	Full time	
		Tamim Ali	Data collection& processing(water quality)	-	-	Agriculture Eng.	Full time	
		Isa Ali	Data collection& processing(meteorology)	-	-	Civil Eng.	Full time	
		Beshar Ibrahim	Data collection& processing(groundwater)	-	-	Assistant Eng.	Full time	
Sima Tarraf		Data collection& processing(operator)	-	-	Assistant Eng.	Not Full		
Yara Jdaed		Data collection& processing(operator)	-	-	Assistant Eng.	Not Full		

Counterpart Personnel and Organization of WRIC (2004.08)							
Centre	Section	Name	Role in WRIC	Expertise	WRIC Assign.	Others	
GDCB	(TARTOUS)	Ismael Shbib	Data collection& processing(measurement)	Assistant Eng.	Full time		
		Ramadan Deeb	Data collection& processing(measurement)	Assistant Eng.	Full time		
		Munir Alaj	Data collection& processing(groundwater)	Mechanical Eng.	Not Full		
		Nawar Alnihhammad	Data collection& processing(surfacewater)	Agriculture Eng.	Not Full		
		Shualb Abdulkarim	Data collection& processing(water quality)	Agriculture Eng.	Not Full		
		Galth Alhassab	Data collection& processing(meteorology)	Civil Eng.	Not Full		
		Yarub Saleh	Data collection& processing(water quality)	Civil Eng.	Not Full		
		Hanadi Yousef	Data collection& processing(administrator)	Agriculture Eng.	Not Full		
		Thaer Saleh	Data collection& processing(operator)	Assistant Eng.	Not Full		
		Husein Hassan	Data collection& processing(operator)	Assistant Eng.	Not Full		
		Badea Khayleh	Data collection& processing(operator)	Assistant Eng.	Not Full		
		Lubna Mahmmod	Data collection& processing(operator)	Assistant Eng.	Not Full		
		Lamis Mansour	Data collection& processing(operator)	Assistant Eng.	Not Full		
			sub-total		20		
		Analysis & System Management Section (LATAKIA)	Mozen Naaman	Section Leader / DB administrator	Hydrogeologist	Full time	MS.
		(TARTOUS)	Abeer Mehjazi	GIS Eng.	Civil Eng.	Full time	
			Fadi Barakat	DB administrator (tartous office)	Civil Eng.	Not Full	
			Zainab Mousa	GIS Engineer	Civil Eng.	Not Full	
			Saadallah Wannous	Data Processing	Geologist	Not Full	
			Maarouf Ganem	Data Processing	Civil Eng.	Not Full	
			sub-total		6		
		Technical Support Section (LATAKIA)	Nazeeh Bourish	Section Leader / System manager	Civil Eng.	Full time	
		(TARTOUS)	Ossama Al-kaddar	System Maintenance	Mechanical Eng.	Not Full	
			Bassan Jamala	System Maintenance	Electrical Eng.	Not Full	
			Nazek Milhem	System Maintenance	Electrical Eng.	Not Full	
			Kamel Ibrahim	System Maintenance	Electrical Eng.	Not Full	
			Shaban Ibrahim	System Maintenance	Electrical Eng.	Not Full	
			sub-total		6		
		Driver/ Workers	Hassam Boshiya	Driver	-	Full time	
			Mahyeddin Ashqan	Driver	-	Full time	
			Yassin Ibrahim	Driver	-	Full time	
			sub-total				
			Total			35+(3)	
			No. WRIC Personnel			73 +(12)	

Note: 17 staff left WRIC after the Project started.

Main Center :5, GDBAB Center: 5, GDCB Center: 7.

11 staff were transferred internally (That is, inside of MOI). 3 staff went to other countries to study, one staff left because of military service.

One left to attend a course, and one staff was fired because of unfavorable attitude towards the job.



## List of Machinery and Equipments

Name of the Equipment	Manufacturer	Type	Number	Total amount	Date of delivery
Notebook PC	SONY	PCG-GR5N/BP	1	230,000	2002/6/15
256MB RAM memory	Greenhouse	GH-SDH133/256BG	1	23,800	2002/6/15
Application Software	Microsoft	Powerpoint 2002	2	48,000	2002/6/15
Application Software	Microsoft	ACCESS 2002	1	33,800	2002/6/15
Multi Printer	Canon	Multi PASS C50	1	68,000	2002/6/15
Digital Camera	Fuji Film	DS-270HD	1	106,000	2002/6/15
Projector	SHARP	PG-C20XJ	1	145,000	2002/6/15
Server Machine (Domain Controller)	IBM	IBM eServer X220	1	396,000	2002/9/14
Server Machine (DB Server)	IBM	IBM eServer X220	1	378,000	2002/9/30
Server Machine (WWW Server)	IBM	IBM eServer X220	1	408,000	2002/9/30
client PC (MC-PC-1)	IBM	NetVista M41	1	166,800	2002/9/14
UPS (Uninterrupted Power Supply)	MGE	Pulsar Extreme 100	9	1,069,200	2002/9/15
RAID Option	IBM	IBM FAST EXP500	1	732,000	2002/11/28
Dial-up Router	Cisco	Router 801	2	156,000	2002/10/30
Hub	Cisco	Switch WS-C2950-2	2	238,400	2002/10/30
CD-R/RW	TEAC	8x/8x/24x USB	1	51,137	2002/9/16
A4 Laser printer	Lexmark	E322	1	59,600	2002/9/16
Firewall	Cisco	PIX 515R	1	488,720	2003/1/12
Operating System	Microsoft	Windows2000 server	3	393,360	2002/9/30
Operating System	Microsoft	Windows2000 Professional	6	128,736	2002/9/15
Application Software	Microsoft	Microsoft Visual Studio .NET	1	157,344	2002/9/30
Application Software	Microsoft	Microsoft Office XP Professior	6	572,160	2002/9/30
A4 Color Scanner	Fujitsu	ScanPartner 620C	1	209,792	2002/9/15
A0 Color Scanner	WIDECOM	SLC936	1	1,251,600	2002/10/5
GIS Database	ESRI	ArcSDE	1	1,788,000	2002/9/30
Server Machine (Domain Controller)	IBM	IBM eServer X220	1	396,000	2002/9/14
Server Machine (Domain Controller)	IBM	IBM eServer X220	1	396,000	2002/9/14
client PC (BAB-PC-1)	IBM	NetVista M41	1	166,800	2002/9/30
UPS (Uninterrupted Power Supply)	MGE	Pulsar Extreme 100	5	594,000	2002/9/14
Dial-up Router	Cisco	Router 801	1	78,000	2002/9/14
Hub	Cisco	Switch WS-C2950-2	1	119,200	2002/9/14
CD-R/RW	TEAC	8x/8x/24x USB	1	51,137	2002/9/14
A4 Laser printer	Lexmark	E322	1	59,600	2002/9/14
Firewall	Cisco	PIX 515R	1	488,720	2002/9/14
Operating System	Microsoft	Windows2000 server	1	131,120	2002/9/14
Operating System	Microsoft	Windows2000 Professional	4	85,824	2002/9/14
Application Software	Microsoft	Microsoft Visual Studio .NET	1	157,344	2002/9/14
Application Software	Microsoft	Microsoft Office XP Professior	4	381,440	2002/9/14
A0 Color Scanner	WIDECOM	SLC936	1	1,251,600	2002/9/14
A0 Color Printer	Hewlett Packard	Design Jet800	1	1,020,000	2002/11/18
A0 Color Printer	Hewlett Packard	Design Jet800	1	1,020,000	2002/11/18
A0 Color Scanner	WIDECOM	SLC936	1	1,251,600	2002/9/14
client PC (CAC-PC-1)	IBM	NetVista M41	1	166,800	2002/9/30
UPS (Uninterrupted Power Supply)	MGE	Pulsar Extreme 1000c	5	594,000	2002/9/14
Dial-up Router	Cisco	Router 801	1	78,000	2002/9/14
Hub	Cisco	Switch WS-C2950-2	1	119,200	2002/9/14
CD-R/RW	TEAC	8x/8x/24x USB	1	51,137	2002/9/14
A4 Laser printer	Lexmark	E322	1	59,600	2002/9/14

## ANNEX2-4

## List of Machinery and Equipments

Name of the Equipment	Manufacturer	Type	Number	Total amount	Date of delivery
Firewall	Cisco	PIX 515R	1	488,720	2002/9/14
Operating System	Microsoft	Windows2000 server	1	131,120	2002/9/14
Operating System	Microsoft	Windows2000 Professional	4	85,824	2002/9/14
Application Software	Microsoft	Microsoft Visual Studio .NET	1	157,344	2002/9/14
Application Soft	Microsoft	Microsoft Office XP Professior	4	381,440	2002/9/14
A0 Color Printer	Hewlett Packard	Design Jet800	1	1,020,000	2002/11/18
GIS Basic Software	ESRI	ArcInfo	5	7,152,000	2002/9/30
GIS Extension	ESRI	ArcPress	1	166,880	2002/9/30
GIS Extension	ESRI	MrSid Encoder	1	178,800	2002/9/30
GIS Extension	ESRI	ArcEditor	5	3,754,800	2002/9/30
GIS Extension	ESRI	ArcGIS Spatial Analyst	6	1,609,200	2002/9/30
GIS Extension	ESRI	ArcGIS3D Analyst	6	1,609,200	2002/9/30
GIS Extension	ESRI	ArcGIS Geostatistical Analyst	6	1,609,200	2002/9/30
GIS Basic Software	ESRI	ArcInfo	2	2,860,800	2002/9/30
GIS Basic Software	ESRI	ArcEditor	2	1,501,920	2002/9/30
GIS Extension	ESRI	ArcGIS Spatial Analyst	2	536,400	2002/9/30
GIS Extension	ESRI	ArcGIS 3D Analyst	2	536,400	2002/9/30
GIS Extension	ESRI	ArcGIS Geostatistical Analyst	2	536,400	2002/9/30
GIS Database	ESRI	ArcSDE	1	1,200,000	2003/3/29
WIND TRANSMITTER - COMPACT	Thies CLIMA	4.3519.00.000	1	47,884	2002/9/22
Project Car	TOYOTA	PRADO GX	1	2,490,000	2002/12/12
Project Car	TOYOTA	PRADO GX	1	2,490,000	2002/12/12
Project Car	TOYOTA	PRADO GX	1	2,490,000	2002/12/12
Project Car	TOYOTA	PRADO GX	1	2,490,000	2002/12/12
Notebook PC	SONY	PCG-GR5N/BP	1	230,000	2002/6/15
client PC (MC-PC-2)	IBM	NetVista M41	6	1,000,800	2002/9/14
client PC (MC-PC-3)	IBM	NetVista M41	1	166,800	2002/9/14
client PC (MC-PC-4)	IBM	NetVista M41	6	1,000,800	2002/9/14
client PC (MC-PC-5)	IBM	NetVista M41	1	166,800	2002/9/14
client PC (MC-PC-6)	IBM	NetVista M41	1	166,800	2002/9/14
256MB RAM memory	Greenhouse	GH-SDH133/256BG	1	23,800	2002/6/15
client PC (BAB-PC-2)	IBM	NetVista M41	1	166,800	2002/9/30
client PC (BAB-PC-3)	IBM	NetVista M41	1	166,800	2002/9/30
client PC (BAB-PC-4)	IBM	NetVista M41	1	166,800	2002/9/30
client PC (CAC-PC-2)	IBM	NetVista M41	1	166,800	2002/9/30
client PC (CAC-PC-3)	IBM	NetVista M41	1	166,800	2002/9/30
client PC (CAC-PC-4)	IBM	NetVista M41	1	166,800	2002/9/30
GIS Database	ESRI	ArcSDE	1	1,200,000	2003/3/29
WIND TRANSMITTER - COMPACT	Thies CLIMA	4.3519.00.000	1	47,884	2002/9/22
WIND DIRECT. TRANSMITTER- COMPACT	Thies CLIMA	4.3129.00.000	1	58,081	2002/9/22
WIND DIRECT. TRANSMITTER- COMPACT	Thies CLIMA	4.3129.00.000	1	58,081	2002/9/22
HYGRO-THERMO- TRANSMITTER - COMPACT	Thies CLIMA	1.1005.54.000	1	46,009	2002/9/22
HYGRO-THERMO- TRANSMITTER - COMPACT	Thies CLIMA	1.1005.54.000	1	46,009	2002/9/22
PYRANOMETER	Thies CLIMA	7.1415.03.000	1	84,915	2002/9/22
PYRANOMETER	Thies CLIMA	7.1415.03.000	1	84,915	2002/9/22

## List of Machinery and Equipments

Name of the Equipment	Manufacturer	Type	Number	Total amount	Date of delivery
PRECIPITATION TRANSMITTER	Thies CLIMA	5.4032.30.008	1	185,679	2002/9/22
PRECIPITATION TRANSMITTER	Thies CLIMA	5.4032.30.008	1	185,679	2002/9/22
BARO TRANSMITTER TYPE: PTB 100 A	Thies CLIMA	3.1158.00.073	1	159,326	2002/9/22
BARO TRANSMITTER TYPE: PTB 100 A	Thies CLIMA	3.1158.00.073	1	159,326	2002/9/22
SUNSHINE DURATION SENSOR	Thies CLIMA	7.1421.00.001	1	257,988	2002/9/22
SUNSHINE DURATION SENSOR	Thies CLIMA	7.1421.00.001	1	257,988	2002/9/22
METEOLOG TDL 14 - COMPACT	Thies CLIMA	9.1740.14.000	1	338,861	2002/9/22
METEOLOG TDL 14 - COMPACT	Thies CLIMA	9.1740.14.000	1	338,861	2002/9/22
WEATHER- AND THERMAL RADIATION SHIELD -	Thies CLIMA	1.1025.55.000	1	22,721	2002/9/22
WEATHER- AND THERMAL RADIATION SHIELD -	Thies CLIMA	1.1025.55.000	1	22,721	2002/9/22
MEMORY - CARD, 256 K	Thies CLIMA	9.2000.00.004	1	26,692	2002/9/22
MEMORY - CARD, 256 K	Thies CLIMA	9.2000.00.004	1	26,692	2002/9/22
READ-OUT UNIT FOR MEMORY CARD	Thies CLIMA	9.1701.10.000	1	64,705	2002/9/22
READ-OUT UNIT FOR MEMORY CARD	Thies CLIMA	9.1701.10.000	1	64,705	2002/9/22
PC-PROGRAM "MC-READ"	Thies CLIMA	9.1701.00.016	1	69,728	2002/9/22
PC-PROGRAM "MC-READ"	Thies CLIMA	9.1701.00.016	1	69,728	2002/9/22
SOLAR-PANEL, 12 V / 5 W	Thies CLIMA	9.1708.00.000	1	60,172	2002/9/22
SOLAR-PANEL, 12 V / 5 W	Thies CLIMA	9.1708.00.000	1	60,172	2002/9/22
ACCUMULATOR 12 V / 6.5 Ah	Thies CLIMA	9.1706.00.000	1	23,454	2002/9/22
ACCUMULATOR 12 V / 6.5 Ah	Thies CLIMA	9.1706.00.000	1	23,454	2002/9/22
BATTERY CHARGER 12 V/1 A	Thies CLIMA	9.1421.20.000	1	29,274	2002/9/22
BATTERY CHARGER 12 V/1 A	Thies CLIMA	9.1421.20.000	1	29,274	2002/9/22
INSTRUMENT	Thies CLIMA	4.3187.11.000	1	69,728	2002/9/22
INSTRUMENT	Thies CLIMA	4.3187.11.000	1	69,728	2002/9/22
PC-PROGRAM MEVIS T 1.6 LIGHT	Thies CLIMA	9.0250.00.000	1	69,728	2002/9/22
PC-PROGRAM MEVIS T 1.6 LIGHT	Thies CLIMA	9.0250.00.000	1	69,728	2002/9/22
SEBA Electric Contact Meter Type	SEBA	KLL30	1	28,489	2002/9/22
SEBA Electric Contact Meter Type	SEBA	KLL30	1	28,489	2002/9/22



## List of Machinery and Equipments

Name of the Equipment	Manufacturer	Type	Number	Total amount	Date of delivery
SEBA Mini Current Meter Equipment M 1	SEBA	M1, Z10, Z4-V	1	656,792	2002/9/22
SEBA Mini Current Meter Equipment M 1	SEBA	M1, Z10, Z4-V	1	656,792	2002/9/22
SEBA WATER QUALITY DIPPER	SEBA	KLL-Q	1	659,176	2002/9/22
SEBA WATER QUALITY DIPPER	SEBA	KLL-Q	1	659,176	2002/9/22
Software TERM	SEBA	TERM	1	86,182	2002/9/22
Software TERM	SEBA	TERM	1	86,182	2002/9/22
SEBA Vertical-Water-Level-Recorder ALPHA-S	SEBA	ALPHA-S	1	899,841	2002/9/22
SEBA Vertical-Water-Level-Recorder ALPHA-S	SEBA	ALPHA-S	1	899,841	2002/9/22
Handterminal HT 100	SEBA	HT 100	1	197,991	2002/9/22
Handterminal HT 100	SEBA	HT 100	1	197,991	2002/9/22
WinOperate read-out and operation	SEBA	WinOperate	1	23,840	2002/9/22
WinOperate read-out and operation	SEBA	WinOperate	1	23,840	2002/9/22
SEBA STAFF	SEBA	SEBA STAFF GAUGES	1	177,608	2002/9/22
SEBA STAFF	SEBA	SEBA STAFF GAUGES	1	177,608	2002/9/22
SEBA Electric Contact Meter Type	SEBA	KLL300	1	92,499	2002/9/22
SEBA Electric Contact Meter Type	SEBA	KLL300	1	92,499	2002/9/22
SEBA Electric Contact Meter Type	SEBA	KLL300	1	92,499	2002/9/22
SEBA Electric Contact Meter Type	SEBA	KLL300	1	92,499	2002/9/22
SEBA Electric Contact Meter Type	SEBA	KLL200	1	68,778	2002/9/22
SEBA Electric Contact Meter Type	SEBA	KLL200	1	68,778	2002/9/22
SEBA Electric Contact Meter Type	SEBA	KLL200	1	68,778	2002/9/22
SEBA Electric Contact Meter Type	SEBA	KLL200	1	68,778	2002/9/22
SEBA WATER QUALITY DIPPER	SEBA	KLL-Q 300	1	430,550	2002/9/22
SEBA WATER QUALITY DIPPER	SEBA	KLL-Q 300	1	430,550	2002/9/22
SEBA Vertical-Water-Level-Recorder ALPHA-S	SEBA	ALPHA-S	1	899,841	2002/9/22
SEBA Vertical-Water-Level-Recorder ALPHA-S	SEBA	ALPHA-S	1	899,841	2002/9/22
Handterminal HT 100	SEBA	HT 100	1	197,991	2002/9/22
Handterminal HT 100	SEBA	HT 100	1	197,991	2002/9/22
Multiparameter sensor Type MPS-D	SEBA	Multiparameter sensor Type M	1	650,129	2002/9/22
Multiparameter sensor Type MPS-D	SEBA	Multiparameter sensor Type M	1	650,129	2002/9/22

## ANNEX2-4

## List of Machinery and Equipments

Name of the Equipment	Manufacturer	Type	Number	Total amount	Date of delivery
Handterminal HT 100	SEBA	HT 100	1	197,991	2002/9/22
Handterminal HT 100	SEBA	HT 100	1	197,991	2002/9/22
SEBA Data Logger Type MDS INSIDER, 1 channel	SEBA	Type MDS INSIDER	1	253,777	2002/9/22
SEBA Data Logger Type MDS INSIDER, 1 channel	SEBA	Type MDS INSIDER	1	253,777	2002/9/22
Portable Water Current Meter	McBirney USA	Flow-Mate2000	1	749,280	2002/3/30
Portable Water Current Meter	McBirney USA	Flow-Mate2000	1	749,280	2003/3/30
Portable Laboratories (a)	HACH	CEL/890 Advanced Portable L	1	632,500	2002/9/22
Portable Laboratories (b)	HACH	CEL/890 Advanced Portable L	1	632,500	2003/3/30
Portable Laboratories (c)	HACH	CEL/890 Advanced Portable L	1	632,500	2002/9/22
Application Software GIS	Softelec	VPstudio V7.0	1	500,640	2001/3/30
Application Software GIS	Softelec	VPstudio V7.0	1	450,576	2001/3/30
Application Soft GIS	Softelec	VPstudio V7.0	1	450,576	2001/3/30
Auto Level Type DSZ2	Geo Master	DSZ2	1	250,320	2001/3/26
NoteBook PC (a)	TOSHIBA	Satelite Pro 6100	1	303,960	2003/3/26
NoteBook PC (b)	TOSHIBA	Satelite Pro 6100	1	303,960	2003/3/26
NoteBook PC (c)	TOSHIBA	Satelite Pro 6100	1	303,960	2003/3/26
client PC (MC-PC10)	IBM	Netvista A30p 8309-7QG	1	154,364	2003/3/30
client PC (MC-PC11)	IBM	Netvista A30p 8309-7QG	1	154,364	2003/3/30
client PC (MC-PC12)	IBM	Netvista A30p 8309-7QG	1	154,364	2003/3/30
client PC (BAB-PC5)	IBM	Netvista A30p 8309-7QG	1	154,364	2003/3/30
client PC (BAB-PC6)	IBM	Netvista A30p 8309-7QG	1	154,364	2003/3/30
client PC (CAC-PC5)	IBM	Netvista A30p 8309-7QG	1	154,364	2003/3/30
client PC (CAC-PC6)	IBM	Netvista A30p 8309-7QG	1	154,364	2003/3/30
Application Software	Microsoft	Microsoft Office XP	3	125,160	2003/3/30
Application Software	Microsoft	Microsoft Office XP	2	83,440	2003/3/30
Application Soft	Microsoft	Microsoft Office XP	2	83,440	2003/3/30
A4 Laser Printer	Hewlett Packard	HP4200N	1	190,720	2003/3/29
A4 Laser Color Printer	Hewlett Packard	HP4600DN	1	190,720	2003/3/29
SEBA Multiparamater Evaluation Software	SEBA	MGMS / MLMS	3	402,300	2003/3/26
Water level Recorder	SEBA	SEBA MDS Insider 2" data logg	1	625,204	2003/3/30
UPS (Uninterrupted Power Supply)	MGE	PULSAR Evolution 1200S	1	39,100	2003/3/30
UPS (Uninterrupted Power Supply)	MGE	PULSAR Evolution 800S	3	86,250	2003/3/30
UPS (Uninterrupted Power Supply)	MGE	PULSAR Evolution 800S	2	57,500	2003/3/30
UPS (Uninterrupted Power Supply)	MGE	PULSAR Evolution 800S	2	57,500	2003/3/30
Desk Top PC	United Group	Space Walker Design11	1	79,350	2003/1/12
Application Software	MicroSoft	Microsoft Office XP Professior	1	47,918	2003/8/5
512MB RAM	unknown	512MB RAM	1	30,590	2003/2/26
256MB RAM	Unknown	256MB RAM	6	165,600	2003/8/10
Digital Camera	Kodak	DX4330	1	57,500	2003/3/22
Digital Camera	Kodak	DX4330	1	57,500	2003/3/22

## ANNEX2-4

## List of Machinery and Equipments

Name of the Equipment	Manufacturer	Type	Number	Total amount	Date of delivery
Digital Camera	Kodak	DX4330	1	57,500	2003/2/17
Digital Copier	XEROX	DC440C	1	828,440	2002/9/21
Handheld GPS	GARMIN	GPS76	1	79,864	2002/11/19
Handheld GPS	GARMIN	GPS76	1	79,864	2002/11/19
Handheld GPS	GARMIN	GPS76	1	79,864	2003/1/25
Handheld GPS	GARMIN	GPS76	1	79,864	2003/3/26
Handheld GPS	GARMIN	GPS76	1	79,864	2003/3/26
Notebook PC	SONY	PCG-GRV88G	1	240,000	2003/2/26
512MB RAM	I/O data	SDD 266-512M	1	32,000	2003/2/26
Application Software	Microsoft	Microsoft Office XP Professor	1	58,000	2003/2/26
Micro Altimeter	American Pauli	MDM-5 (Code Word:DECIM)	2	1,000,000	2003/8/22
GIS Basic Software	ESRI	ArcInfo	2	2,860,800	2002/9/30
GIS Basic Software	ESRI	ArcEditor	2	1,501,920	2002/9/30
GIS Extension	ESRI	ArcGIS Spatial Analyst	2	536,400	2002/9/30
GIS Extension	ESRI	ArcGIS 3D Analyst	2	536,400	2002/9/30
GIS Extension	ESRI	ArcGIS Geostatistical Analyst	2	536,400	2002/9/30
UPS	MGE	Pullсар Ellipse 1200	1	41,170	2004/2/16
UPS	MGE	Pullсар Ellipse 1200	1	38,870	2004/2/16
UPS	MGE	Pullсар Ellipse 1200	1	38,870	2004/2/16
Digital Video Projector	NEC	GS-40	1	150,938	2004/2/16
Projector	EPSON	ELP703	1	500,000	2003/3/1
Current meter	OTTO	C20 Current Meter	1	296,700	2002/3/20
Water level meter	OTTO	TYP010 100meter	1	82,800	2002/3/12
Water level meter	OTTO	TYP010 200meter	1	124,200	2002/4/30
Digital Video Camera	Panasonic	NV-GS5K	1	100,000	2002/6/15
Digital Camera	OLYMPUS	CAMEDIA C-100	1	30,000	2002/6/15
Application Software	Rockware Inc.	Rockware	9	0	2002/6/15
Application Software	Environmental	GMS	3	300,000	2002/6/15
Digital Camera	Canon	IXY DIGITAL 200	1	30,000	2003/2/26
Application Software	Microsoft	Office XP Small Business	1	47,918	2003/8/5
512MB RAM	IBM	512MB	2	209,760	2003/8/10
Water Level Meter	OTTO	TYP010 300meter	1	165,600	2002/2/11
Water Test °C,pH,ORP,EC	HANNA INSTR	S/N 1210327	1	20,700	2002/3/16
Application Software	Symantec	Symantec Antivirus	7	146,300	2004/3/26
Pressure Sensor	SEBA	Type DS	1	290,400	2004/6/9
Total				93,666,815	Japanese Yen

\*Japanese Yen

ANNEX 2-5-1

WRIC budget starting from July 2002 till December 2004

WRIC implemented cost 2002 (S.P)				
Organization	7 - 12			
	Salary	Preparation work (office supplies and others)	Fuel consumption	Sum
Main center	230.000	1.052.500	760.000	2.042.500
GDBAB	1.976.000	200.000	300.000	2.476.000
GDCB	1.000.000	250.000	150.000	1.400.000

WRIC implemented cost 2003 (S.P)				
Organization	1 - 3			
	Salary	Preparation work (office supplies and others)	Fuel consumption	Sum
Main center	330.000	77.000	330.000	737.000
GDBAB	990.000	---	135.000	1.125.000
GDCB	450.000	---	85.000	535.000

WRIC implemented cost 2003 (S.P)				
Organization	4 - 6			
	Salary	Preparation work (office supplies and others)	Fuel consumption	Sum
Main center	330.000	110.000	330.000	770.000
GDBAB	990.000	---	135.000	1.125.000
GDCB	450.000	---	85.000	535.000

WRIC implemented cost 2003 (S.P)				
Organization	7 - 9			
	Salary	Preparation work (office supplies and others)	Fuel consumption	Sum
Main center	450.000	75.000	330.000	855.000
GDBAB	990.000	959.000	135.000	2.084.000
GDCB	450.000	480.000	85.000	1.015.000

WRIC implemented cost 2003 (S.P)				
Organization	10 - 12			
	Salary	Preparation work (office supplies and others)	Fuel consumption	Sum
Main center	468.900	45.000	330.000	843.900
GDBAB	900.000	2.559.000	135.000	3.594.000
GDCB	450.000	830.000	85.000	1.365.000

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ANNEX 2-5-1

WRIC implemented cost 2004 (S.P)				
Organization	1 - 3			
	Salary	Preparation work (office supplies and others)	Fuel consumption	Sum
Main center	468.900	35.000	330.000	833.900
GDBAB	1.020.000	3.080.000	135.000	4.235.000
GDCB	960.000	890.000	125.000	2.015.000

WRIC implemented cost 2004 (S.P)				
Organization	4 - 6			
	Salary	Preparation work (office supplies and others)	Fuel consumption	Sum
Main center	493.200	15.000	330.000	838.200
GDBAB	1.086.500	7.657.360	135.000	8.878.860
GDCB	995.000	1.220.000	135.000	2.350.000

WRIC implemented cost 2004 (S.P)				
Organization	7 - 9			
	Salary	Preparation work (office supplies and others)	Fuel consumption	Sum
Main center	493.200	15.000	330.000	838.200
GDBAB	1.198.500	6.848.105	135.000	8.181.605
GDCB	1.090.000	1.630.000	135.000	2.855.000

Total implemented cost (S.P)				
Organization	June, 2002 ---- Sep, 2004			
	Salary	Preparation work (office supplies and others)	Fuel consumption	Sum
Main center	3264200	1425500	3070000	7759700
GDBAB	9151000	21303465	1245000	31699465
GDCB	5845000	5300000	735150	11880150
Grand Total	18260200	28028965	5050150	51339315

WRIC budget 2004 (S.P)				
Organization	10 - 12			
	Salary	Preparation work (office supplies and others)	Fuel consumption	Sum
Main center	563.700	95.000	330.000	988.700
GDBAB	1.254.500	4.500.000	135.000	5.889.500
GDCB	1.100.000	1.300.000	135.000	2.535.000

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## Operation Expenses of the Project (Japanese Side )

US\$

	Implemented cost ( '04 4-6: budget base)			Sub Total
	FY2002	FY2003	FY'04	
Local Activity Cost	38,162.63	43,221.21	27,639.00	109,022.84
Business trip expenses	5,654.62	6,212.04	718.45	12,585.11
Transportation	6,094.37	3,393.30	1,701.75	11,189.42
Others	5,812.41	7,797.72	86.01	13,696.14
Equipment	7,430.88	6,391.21	2,640.00	16,462.09
Stationary	9,214.23	6,955.41	2,492.23	18,661.87
Documentation	2,223.11	8,305.36	1,583.01	12,111.48
Correspondence	970.87	557.67	320.29	1,848.83
Translator etc.	338.83	233.01	1,816.00	2,387.84
Maintenance	19.42	306.00	0.00	325.42
Meeting expenses	0.00	2,719.42	3,594.33	6,313.75
Construction	427.18	0.00	0.00	427.18
<b>Total</b>	<b>38,185.92</b>	<b>42,871.14</b>	<b>14,952.07</b>	<b>96,009.13</b>
			<b>Total</b>	<b>109,022.84</b>

## Cost concerned to Equipment

Providing Equipment		
PC and Software	165,467.00	
GIS Software	250,600.00	
Observation Equipment	141,742.00	
4 Project Cars	83,000.00	
Other Additional Equipment	107,078.00	
Sub total		747,887.00
Purchased by Local Cost	16,462.09	
Grand total		764,349.09