Republic of Iraq
Ministry of Water Resources
Ministry of Agriculture

Project for Sustainable Irrigation Water Management through Water Users Associations (Stage2) in the Republic of Iraq

Final Report

May 2024

Japan International Cooperation Agency
(JICA)

NTC International Co., Ltd.
Grassroots Experts, LLC

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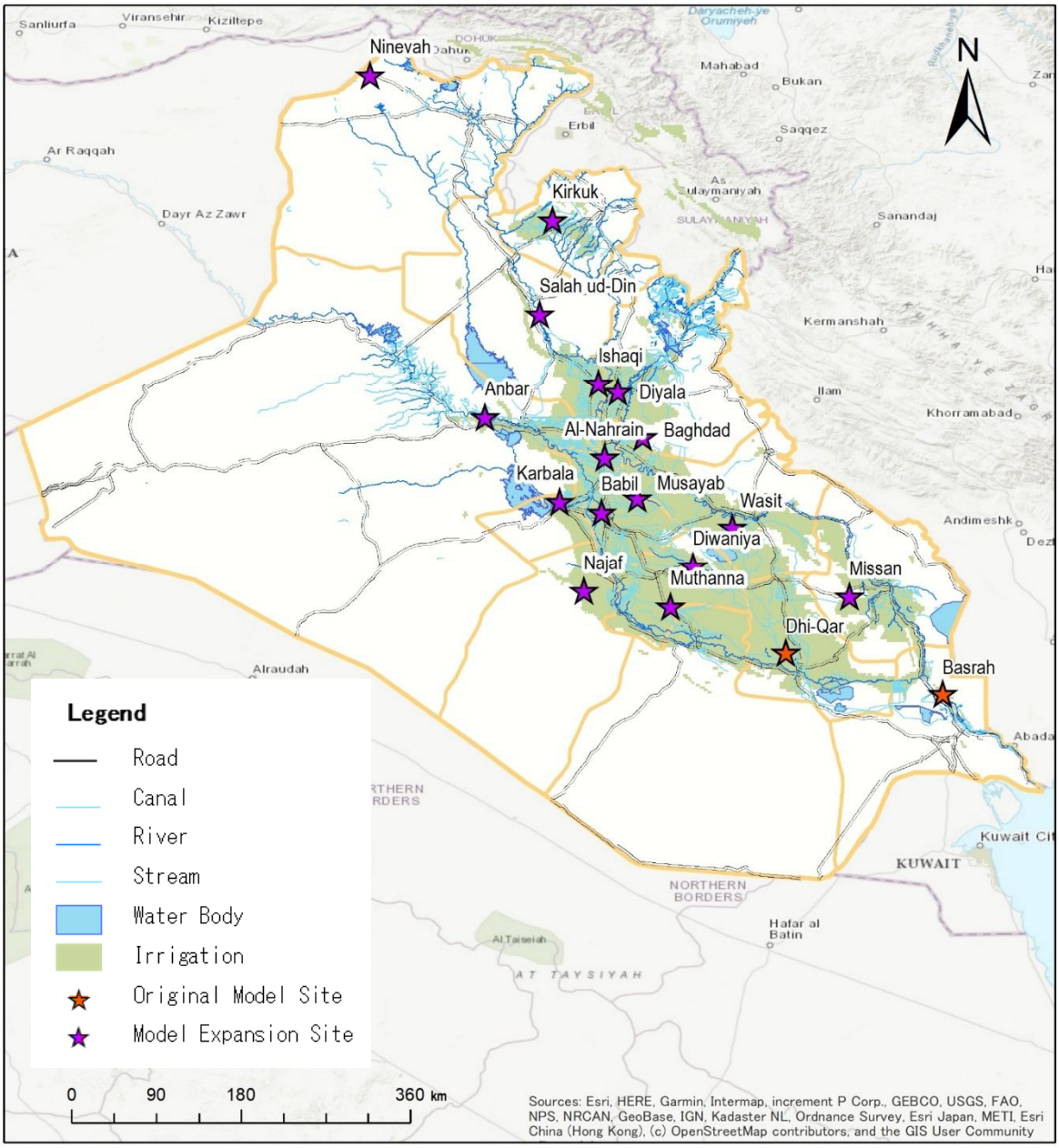

Project Location Map

Photos of Project Activities (1/2)

Model expansion meeting1
(July 2022)

Courtesy call to the Dite members
(January 2023)

Courtesy call to the Minister of Agriculture
(February 2023)

Training to the new extension staff of DoWR and DoA(May 2023)

Model expansion meeting2
(May 2023)

Courtesy call PMAC
(May 2023)

Photos of Project Activities (2/2)

Meeting with main CPs of MoWR and MoA (August 2023)

Courtesy call to the Minister of Water Resources and the Deputy Minister of Agriculture (August 2023)

Model expansion meeting3 (August 2023)

Lecture to the Baghdad University students (December 2023)

Courtesy call to the Minister of Water Resources and the Deputy Minister of Agriculture (December 2023)

TV program appearance by Ambassador Matsumoto and WUA publicity (December 2023)

Project for Sustainable Irrigation Water Management Through Water Users Association (Stage 2)

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Figures and Tables

Abbreviations

abbreviation	English
C/P	Counterpart
DoA	Directorate of Agriculture
DoWR	Directorate of Water Resources
F/R	Final Report
GoI	Government of Iraq
GoJ	Government of Japan
JICA	Japan International Cooperation Agency
MoA	Ministry of Agriculture
MoP	Ministry of Planning
MoWR	Ministry of Water Resources
O&M	Operation and Maintenance
OMM	Operation, Maintenance and Management
PDM	Project Design Matrix
PIDP	Participatory Irrigation Development Plan
PMAC	Prime Minister's Advisory Commission
P/R	Progress Report
R/D	Record of Discussions
SWLRI	Strategy for Water and Land Resources in Iraq
TCP	Technical Cooperation Project
ToR	Terms of Reference
ToT	Training of Trainers
TT	Task Team
WMT	WUA Management Team (DoWR and DoA officials)
W/P	Work Plan
WUA	Water Users Association

Terminology

Off-farm water management = irrigation water management from intake facilities to individual fields
On-farm water management = in-field irrigation water management
Water management = irrigation water management
Participatory Irrigation Development Plan (PIDP) = an annual action plan prepared by WUA with help of WMT to improve water management

Chapter 1 Outline of the Project

1.1 Background and Challenges

(1) Background and Purpose of the Project

In the Republic of Iraq (hereinafter referred to as "Iraq"), irrigated agriculture is highly important for agricultural production because the annual rainfall is below 500 mm, which is said to be the feasible line for rain-fed agriculture, except in some areas in the north. About 90% of Iraq's water resources depend on water intake from the Tigris and Euphrates Rivers that flow through the center of the country, and most of this water is used for agriculture, but the river flows are decreasing due to the construction of large dams and irrigation development in the countries upstream of both international rivers. In addition, the limited water resources are not being used effectively due to the deterioration of irrigation facilities and inadequate water management. For this reason, the Iraqi government has been promoting the improvement of irrigation efficiency in order to prevent the decline in agricultural productivity due to the decrease in water resources.

JICA mainly provided support for the establishment and dissemination of water users associations (hereinafter referred to as WUAs) under "the Project for Spreading Water Users Associations for the Efficient Use of Irrigation Water" from 2012 to 2015. As a result, the WUA instructions (Iraq's first Water Users Association Law) was enacted in April 2014, and the establishment of WUAs began, with 70 WUAs established in 15 governorates by September 2015. However, there were no detailed guidelines or manuals governing the activities of the established WUAs, and the challenge was to activate the established WUAs and improve water management through them.

Therefore, the Project for Sustainable Irrigation Water Management through Water Users Associations (hereinafter referred to as "Stage 1") was implemented from 2017-2021 to provide technical assistance for the development and preparation for dissemination of the Sustainable Water Management Model ("Water Management Model"), which provides fair and efficient water use through WUAs. In addition, policy recommendations were prepared to strengthen the WUA system.

Based on the activities and achievements of Stage 1, this project (hereinafter referred to as "Stage 2") aims to disseminate the water management model nationwide and strengthen the WUA system (realization of the policy recommendations) through continuous support and monitoring by dispatching Japanese experts. The goal and expected outputs of Stage 1 and Stage 2 are shown in the table below.

Table 1.1 Goal and Expected Outputs of Stage 1 and Stage 2

	Stage 1	Stage 2
Overall goal	Sustainable water management areas operated by WUAs are expanded to the whole country.	
Project purpose	**Sustainable water management model through WUAs is developed** for its expansion.	**The dissemination system of the sustainable water management model is strengthened.**
Expected outputs	1) Participatory Irrigation Development Plan (PIDP) through WUAs is developed in the model sites. 2) WMT training system is developed through the activities in the model sites.	1) PIDP is implemented at each site. 2) Policy-recommendation paper prepared in Stage 1 is implemented.

	3) WUA training system is developed through the activities in the model sites. 4) WUA monitoring system is prepared through the activities in the model sites. 5) Basic capacity of WMTs is strengthened in 15 governorates.	

(2) Summary of Stage 1 Activities

The activities of Stage 1 can be broadly classified into model development and preparation of the model dissemination, as shown in the figure below.

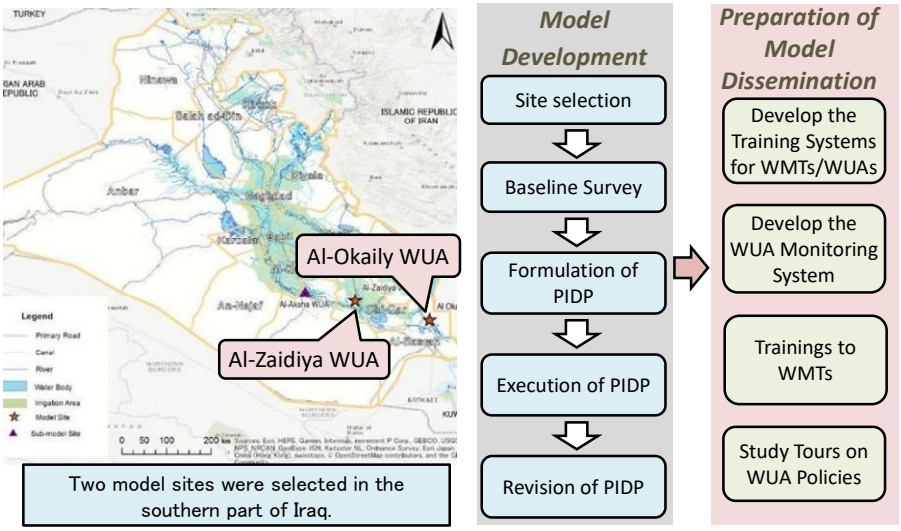


Figure 1.1 Outline of Stage 1 Activities

As shown in the above figure, to develop the water management model, two WUAs were selected as model sites, and baseline surveys were conducted to specifiy the issues related to water management in the sites. Next, the Participatory Irrigation Development Plan (PIDP), which is an action plan of WUA for improving water management, was formulated and implemented to solve the issues in each site. The PIDP consists of four chapters: Chapter 1: Purpose of the PIDP, Chapter 2: Issues Related to Water Management, Chapter 3: Action Plan, and Chapter 4: Implementation Schedule. And the Chapter 3, which is the main body of the PIDP, consists of five sections: 3.1: WUA Management, 3.2: Maintenance, 3.3: Off-farm Water Management, 3.4: On-farm Water Management, and 3.5: Facility Planning. The PIDP uses wording that farmers can understand easily and describes the action plan that the WUA wants to address. After the PIDP was implemented, the WUA and WMT reviewed the results of the activities and revised the PIDP for next season. This cycle of improvement complosed of PIDP formulation, implementation, and revision was defined as the water management model, and it was assumed that PIDP implementation and revision would be repeated annually (or every cropping season), and water management at the two model sites was gradually improved through this cycle.

Next, the training systems for WMTs and WUAs were developed to prepare the model dissemination. The training system for WMTs is a system in which Master Trainers (MTs), who have been trained through activities at the model sites, provide training to WMTs nationwide, and the training system for WUAs is a system in which WMTs nationwide who have received training from MTs support the activities of WUAs in their governorates. These training systems were finalized as consisting of 1) training program, 2)

training materials, 3) trainers, and 4) implementation structure. The WUA monitoring system was also developed as a mechanism to quantitatively monitor the progress of water-management improvement based on the PIDP.

In addition, based on the progress of activities at the model sites, trainings were provided to WMTs throughout the country to strengthen their capacity to disseminate the water management model. Moreover, study tours on WUA policy was also conducted, mainly for the central government C/Ps to gain knowledge on WUA policies and institutions in other countries. Based on the study tours, a policy-recommendation paper was prepared to strengthen the WUA system in Iraq.

(3) Achievements and Challenges of Stage 1

The table below summarizes the achivements and challenges of Stage1.

Table 1.2 Achievements and challenges of Stage 1

	Achievements	Challenges
Development and dissemination of the water management model	● Through the activities in Stage 1, effectiveness of improved water management thorugh PIDP was observed quantitatively in the two model sites (e.g., fair water distribution, maintenance of irrigation facilities based on the money collected from farmers, and reduced irrigation hours with increased yields). ● As for nationwide dissemintion of the water management model, PIDPs have been approved in 13 of the 16 WUAs that are candidates for dissemination.	● The number of WUAs in Iraq increased to 169 at the end of Stage 1, but the 169 WUAs cover only about 6% of Iraq's total irrigated area. ● Short-term challenge: Steady dissemination of the water management model to 16 WUAs. ● Medium- to long-term challenge: How to promote further dissemination and how to improve the coverage area of WUAs.
Goverment al structure to promote WUAs	● At the central-government level: MoWR has a "WUA Department" and this department is in charge of WUA operations. MoA, on the other hand, had no department to support WUA. However, during the period of Stage 1, the "On-farm water management and WUA Section" was established to officially support WUAs. ● At the governorate level: 18 WMTs are formed in 15 governorates to promote WUAs. Each WMT consists of 4 to 5 staff members from DoWR and 4 to 5 staff members from DoA, for a total of 8 to 10 members. However, with the exception of one WMT member who belongs to the "WUA Section" of DoWR, each WMT member is responsible for promoting WUAs while performing his or her own duties in his or her department. Therefore, efforts were made to set up the permananent structure, and "On-farm water management and WUA section" had been established in 10 DoAs, with the other DoAs awaiting approval.	● Short-term challenge: Complete the establishment of the section of on-farm water management and WUA in all DoAs. ● Medium- to long-term challenge: The WMT is a temporarlly team based on the ministerial order, not a permanent organization as specified in the organizational chart of DoWR and DoA. In light of this, how to further strengthen the governmental structure to promote WUAs?
Strengthen ing the WUA System	● A policy-recommendation paper was prepared to strengthen the WUA system in Iraq. The document includes the following recommendations: (1) Promote WUAs with federated structures (large-scale WUAs) (2) Establish a permanent-organizational structure to promote WUAs at the governorate level	● The policy-recommendation paper was signed by the directors of both MoWR and MoA in January 2021, and as of February of the same year, are in the process of being submitted to the Opinion

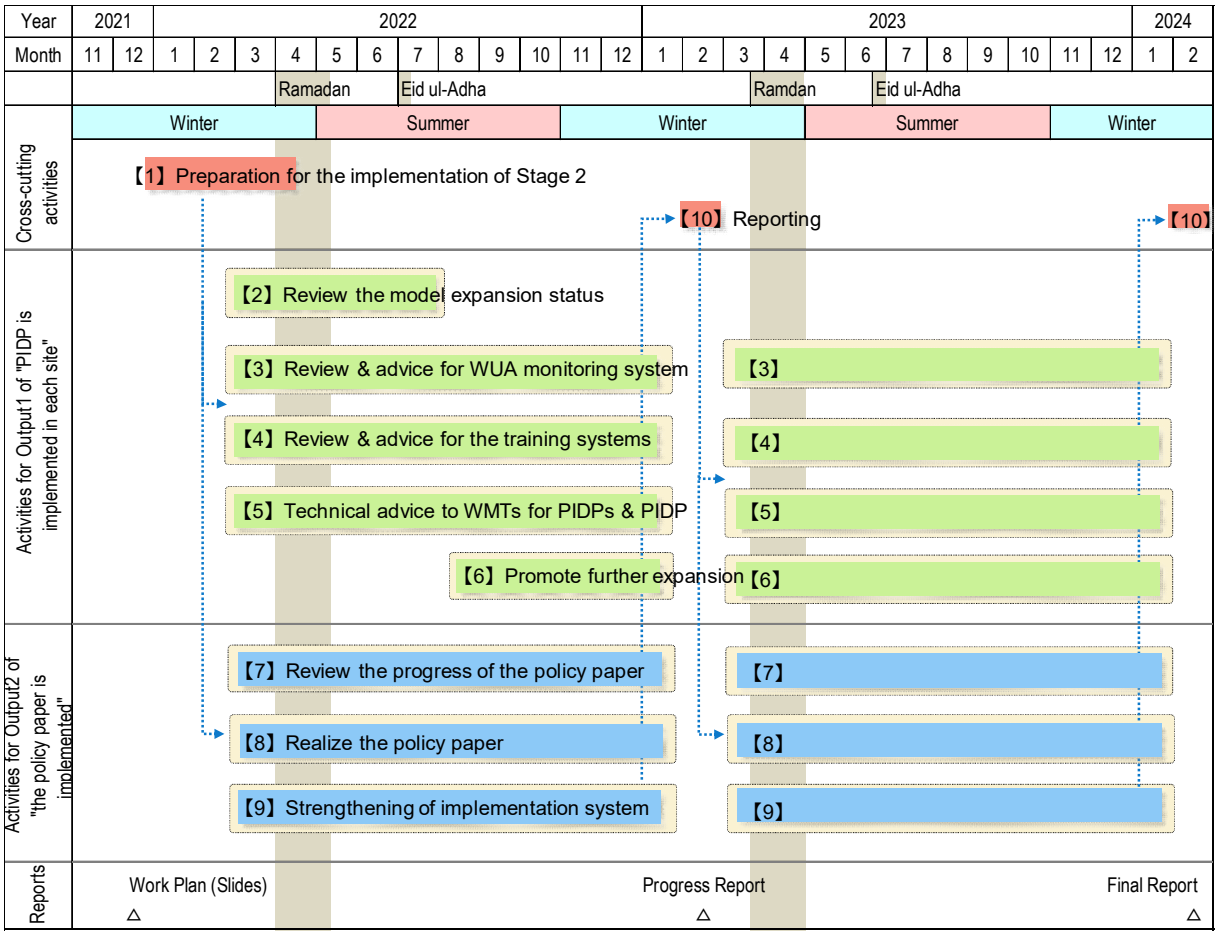
	(3) Make the establishment of WUAs a prerequisite for improving irrigation facilities, and (4) Introduce a system whereby farmers are forced to be members of WUAs	Commission (a meeting body composed of the minister and all directors) of both ministries. This progress needs to be followed up to realize the recommended policies.

Chapter 2 Activities

2.1 Flowchart

A flowchart of Stage 2 is shown below.

Table 2.1 Flowchart of Stage 2



The activities corresponding to the above flowchart are described from the next section.

2.2 Activities

2.2.1 Cross-cutting activities

The cross-cutting activities are indicated by [1] and [10] in the flowchart in 2.1, and their respective activities are as follows.

[1]	Preparation for the implementation of Stage 2

An outline of the work plan (slides) was prepared and agreed upon after discussions with Iraqi counterparts at the first visit of the Japanese experts to Iraq.

[10]	Preporting

The activities in the first half of Stage 2 are summarized in a progress report. And the overall activities of the Stage 2 are summarized in the final report (This report).

2.2.2 Activities related to Output 1: PIDP is implemented at each site

The activities related to Output 1 are indicated by [2] through [6] in the flowchart in 2.1, and their respective activities are described below. Note that activities [2] and [5] are described in one item.

[2]	Review of the model expansion status
[5]	Technical advice to WMTs for PIDPs and PIDP cycle

(1) Situation before the start of Stage 2 and outline of activities in Stage 2

PIDP is defined as an annual (or per cropping season) action plan of WUA for improving water management and is to be supported by the WMT in its formulation. At the end of Stage 1, the two model sites (2 WUAs) had undergone multiple cycles of PIDP revision. Other than the model sites, 16 WUAs had formulated draft PIDPs, of which 13 WUAs had approved PIDPs (for the winter cropping season 2020-21).

After the start of Stage 2, the revision and approval status of these PIDPs were confirmed, and advice on PIDP implementation and other matters was provided to WMTs as appropriate to ensure smooth progress in model dissemination. These activities were conducted through the model expansion meetings mainly held in Baghdad with 18 WMTs. In addition, it was confirmed that the manuals prepared in Stage 1 were used by the WMTs to support the WUAs as appropriate.

(2) Results of activities in Stage 2

<Results of model dissemination in the winter cropping season 2021-22>

With regard to the progress of the dissemination of the water management model to the 16 WUAs nationwide, the table below shows the governmental-agricultural plan, PIDP approvals, and the support provided to the WUAs by WMTs.

In Iraq, the government approves the agricultural plan before cropping season, and the necessary amount of water is supplied to each district based on this plan. When the agricultural plan is 100%, it means that

farmers can cultivate all the farmland in which they have a formal agricultural relationship. If the agricultural plan is 50%, half of the farmland can be cultivated, and if it is 0%, no cultivation at all.

Table 2.2 Agricultural Plan and PIDP Approval and Support to WUA by WMT (Winter 2021-22)

		Good	Nutral	Bad	Remark
Governmental-Agricultural Plan and PIDP Approval (Winter 2021-22)	Agricultural Plan for target WUA area	100%: 0	50%: 10	0%: 6	-
	Approval of PIDP by WUA General Assembly	Approved: 9	-	No approval: 7	-
Status of support to WUA by WMT (Jan-Jul 2022)	Frequency of visits	5 or more times: 8	3-4 times: 1	1-2 times: 6	N/A: 1 (Baghdad)
	Frequency of phone calls or WhatsApp	Frequent: 13	Normal: 0	Less: 2	N/A: 1 (Baghdad)
	Cooperation between DoWR and DoA	Good: 8	Normal: 3	Worse: 4	N/A: 1 (Baghdad)

From the above table, the followings can be noted for the winter cropping season 2021-22.

- Out of 16 WUAs targeted for dissemination of the water management model, the agricultural plan allowed cultivation on 50% of the farmland for 10 WUA areas and 0% for six WUA areas. Therefore, it can be said that Iraq has faced serious water crisis. The main reasons for this are low rainfall due to both climate change in the upstream countries of Tigris-Euphrates River Basin and irrigation development in the upstream countries.
- Out of the 10 WUAs with 50% of the agricultural plan, nine WUAs successfully completed approval of PIDPs in their general meetings. The remaining one WUA (Anbar) was unable to approve PIDP due to delays the agricultural plan by the goverment. In six WUAs with 0% of the agricultural plans, PIDPs were not approved.
- Regarding the support provided by WMTs to the 16 WUAs, eight WMTs visited their WUAs at least 5 times during the period from January to July 2022. In addition, eight WMTs have sufficient cooperation between DoWR and DoA in their daily operations. However, four WMTs responded negatively, stating that there is no or insufficient coordination between DoWR and DoA.

Out of the nine WUAs with approved PIDPs, main WMT members was changed twice in Wasit, and as a result, WMT members did not have information on the status of PIDP implementation. The status of water management improvements based on the PIDP for the other eight WUAs is summarized in the table below.

Table 2.3 Improvements in water management based on PIDPs (Winter 2021-22)

Category	Sub-category	Good	Nutral	Bad	Remark
WUA management	Board meeting (Jan-Jul 2022)	5 or more times: 5	3-4 times 3	1-2 times: 0	-
	Collection of OMM	Yes:	-	No:	-

Category	Sub-category	Good	Nutral	Bad	Remark
	subscription	8		0	
	Decision on unit price of OMM subscription before the season	Yes: 5	-	No: 3	-
	Collection ratio of OMM subscription	More than 90%: 7	50 - 89% 0	1-49%: 1	-
maintenance	Maintenance records	Yes: 8	-	No: 0	-
Off-field water management	Fair water distribution rule	Yes: 8	-	No: 0	-
In-field water management	Dissemination of water-saving irrigation methods	Yes: 6	-	No: 1	N/A: 1 (Karbala)

From the above table, the followings can be noted.

- In all eight WUAs, board meetings were held at least 3 times between January and July 2022. Regarding OMM subscription, only five out of eight WUAs even decided the unit price of OMM subscription in advance in the PIDP, but all eight WUAs have collected OMM subscription, and seven of them have a collection rate of 90% or higher.
- All eight WUAs have maintenance-record books. In addition, all eight WUAs have prepared and implemented fair water distribution rules within each WUA area.
- Six of the eight WUAs showed progress in dissemination of water-saving irrigation methods.
- From the above, the Japanese experts evaluate that the eight WUAs with approved PIDPs was functioning well.

Regarding the detailed information for the 16 WUAs in the winter cropping season 2021-22, refer to the attachment 1.

<Results of model dissemination in the winter cropping season 2022-23>

The table below shows the governmental-agricultural plan, PIDP approvals, and the support provided to WUAs by WMTs for the winter cropping season 2022-23.

Table 2.4 Agricultural Plan and PIDP Approval and Support to WUA by WMT (Winter 2022-23)

		Good	Nutral	Bad	Remark
Governmental-Agricultural Plan and PIDP Approval (Winter 2022-23)	Agricultural Plan for target WUA area	100%: 1	25%: 10	0-10%: 5	-
	Approval of PIDP by WUA General Assembly	Approved: 8	-	No approval: 8	-
Status of support to WUA by WMT (Jan 2022 – Jan 2023)	Frequency of visits	5 or more times: 4	3-4 times 7	0 to 2 times: 4	N/A: 1 (Wasit)

	Frequency of phone calls or WhatsApp	Frequent: 11	Normal: 2	Less: 2	N/A: 1 (Wasit)
	Cooperation between DoWR and DoA	Good:. 9	Normal: 2	Worse: 4	N/A: 1 (Wasit)

From the above table, the followings can be noted for the winter cropping season 2022-23.

- Out of 16 WUAs targeted for dissemination of the water management model, the agricultural plan allowed cultivation on 25% of the farmland for 10 WUA areas and 0-10% for five WUA areas. In the previous year, the agricultural plan allowed cultivation on 50% of the farmland for 10 WUA areas. Therefore, Iraq faced more serious water shortage although the agricultural plan was changed after starting the winter cropping season and generally allowed cultivation on 50% of the farmland. The agricultural plan allowed cultivation on 100% of the farmland for one WUA area (Najaf), but this is due to the special characteristics of the WUA, which uses center-pivot sprinklers with wells as the water source rather than rivers.
- PIDPs were approved by eight of the 16 WUAs in their general meetings in case of 25% or 100% of the agricultural plans. In other words, PIDPs were not approved by WUAs in case of 0-10% agricultural plans.
- Regarding the support provided by WMTs to the 16 WUAs, four WMTs visited their WUAs at least 5 times during the period from August 2022 to January 2023. In addition, nine WMTs have sufficient cooperation between DoWR and DoA in their daily operations. However, four WMTs responded negatively, stating that there is no or insufficient coordination between DoWR and DoA.

The status of water management improvements based on the PIDP for the eight WUAs is summarized in the table below.

Table 2.5 Improvements in water management based on PIDP (Winter 2022-23)

Category	Sub-category	Good	Nutral	Bad	Remark
WUA management	Board meeting (Jan-Jul 2022)	5 or more times: 7	3-4 times: 1	1-2 times: 0	-
	Collection of OMM subscription	Yes: 7	-	No: 1	-
	Decision on unit price of OMM subscription before the season	Yes: 6	-	No: 2	-
	Collection ratio of OMM subscription	More than 90%: 5	50- 89%: 0	1-49%: 2	-
maintenance	Maintenance records	Yes: 6	-	No: 2	-
Off-field water management	Fair water distribution rule	Yes: 8	-	No: 0	
In-field water management	Dissemination of water-saving irrigation methods	Yes: 6	-	No: 2	

From the above table, the followings can be noted.

- In the seven WUAs among the eight WUAs, board meetings were held at least 5 times between August 2022 and January 2023. In addition, seven WUAs collect OMM subscription, and six of them determined the unit price of OMM subscrption in advance in their PIDPs. The WUA (Anbar), which does not collect OMM subscrption, cited the following reasons for not collecting OMM subscription: until last year, the WUA employed a pump operator with OMM subscrption, but the operator was replaced by a government employee, and the canals in the WUA are lined with concrete, so there is little need for canal maintenance.
- Six of the eight WUAs kept maintenance records. One of the two WUAs that did not keep maintenance records because they did not experience any maintenance problems, and the other indicated that the government keeps records because the pump operator used to keep records but the operator switched to government employment.
- All eight WUAs determined and implemented the fair water distribution rules.
- Six of the eight WUAs showed progress in dissemination of water-saving irrigation methods.
- Based on the above, the Japanese experts evaluate that the eight WUAs with PIDPs are function well, although they are facing serious water shortage.

Regarding the detailed information for the 16 WUAs in the winter cropping season 2022-23, refer to the attachment 2.

<u>< Progress of model dissemination in the winter cropping season 2023-24 ></u>

The final field work of Stage 2 was conducted in November-December 2023. During this work, in addition to the final results of the winter cropping season 2022-23, progress toward the winter cropping season 2023-24 was confirmed as follows.

- Water Resource Constraints for the winter cropping season 2023-24: For the winter cropping season 2023-24, irrigated agriculture is only allowed in 25% of the total agricultural land in Iraq due to the water crisis, and water resource constraints remain severe. It should be noted that while irrigated agriculture (water intake) is allowed in 25% of agricultural land in Iraq as a whole, water allocations are not uniform across the governorates, and the allocations within the governorates also vary.
- Number of PIDPs approved for the winter cropping season 2023-24: PIDPs were approved in 19 WUAs for the winter cropping season 2023-24. This was almost double the 10 PIDPs approved last year. When reviewing the last year's results, the following policies contributed to the increase in the number of approvals: 1) For the WMTs that are supporting the site facing difficulties in water share, if there is another WUA that water is available within their governorate, change the site; 2) For the

WMTs that have successfully achieved the revision and implementation of the PIDP for the winter cropping season of 2022-23 in their governorate, select a second expansion site to formulate and implement the PIDP for the winter cropping season of 2023-24.

Table 2.6 Water resource constraints and PIDP approvals for the winter cropping season 2023-24

	WUA area (donam)	Cultivated area (donam)	No. of WUA members	Agricultural plan	General meeting (PIDP)
Salah ud-Din	-	-	-	0%	-
Ninevah (Original)	-	-	-	0%	-
Ninevah (New: WCO4)	270	216	27	13%	Yes
Kirkuk	3,710	3,000	73	25%	Yes
Babil (Original: Al Kawas)	4,258	2,000	200	18%	Yes
Babil (New: Mahweel)	45,000	2,000	710	4%	Yes
Najaf	18,000	8,450	55	100%	Yes
Karbala	2,609	1,000	81	30%	Yes
Ishaqi	2,500	500	97	20%	Yes
Musayab	1,680	300	54	30%	Yes
Diyala	2,500	776	64	31%	Yes
Anbar	-	-	-	0%	-
Baghdad (Original site)	-	-	-	0%	-
Baghdad (New: 4N_WC_42)	1,163	407	65	35%	Yes
Mabain Al-Nahrain	450	60	20	30%	Yes
Missan	5,000	2,000	50	40%	Yes
Wasit	5,000	1,243	23	23%	Yes
Muthanna	1,700	200	91	22%	Yes
Diwaniya	20,000	5,000	400	10%	Yes
Basrha (Okaily)	6,000	6,000	50	100%	Yes
Basrha (New: Khayaber)	6,000	1,000	21	17%	Yes
Basrha (New, Bait Ghazeil)	4,000	4,000	32	100%	Yes
Dhi-Qar	1,540	450	62	40%	Yes
Total or Average	131,380	38,602	2,175	30%	19

- Model Dissemination Results: The progress made in the winter cropping season 2023-24 and the results of the winter cropping season 2022-23, as identified during the final field work in Stage 2, are summarized below. These are the results of the model dissemination that was the main focus of Stage 2.

Table 2.7 Model dissemination results

SN	Item	Contents
1	Approval of PIDP	The PIDPs were approved by the General Meetings of 19 WUAs for the winter cropping season 2023-24. For these 19 WUAs, the total number of members is 2,175 farmers, the WUA area is 32,845 ha (131,380 donam), and the cultivated area for the winter cropping season is 9,650 ha (38,602 donam).
2	OMM subscription	Average collection rate of OMM subscription for 11 model extension sites was 87% (Results of 2022-23 winter).
3	Maintenance	Maintenance activities were conducted with records of inspection and maintenance by 16 WUAs (Results of 2022-23 winter).
4	Water	Fair water distribution rules were formulated and implemented by 14 WUAs (Results

SN	Item	Contents
	distribution	of 2022-23 winter).
5	Water saving irrigation method	In the winter cropping season 2023-24, 11 laser land levelers were in operation. Three of them were provided by JICA in Stage 1, and the remaining eight were purchased by farmers. 11 LLLs were used by a total of 246 farmers, and 2,658 ha (10,632 donam in total) were leveled. This is the result of the steady dissemination activities conducted so far, including: 1) active communication of the benefits of LLL to local farmers by DoA and DoWR officials; 2) borrowing LLL owned by the Wheat Program of the Ministry of Agriculture, exhibiting as a demonstration, collecting data, and holding seminars, etc. within the WUA.
6	Participation of female farmers	In the winter cropping season 2023-24, four WUAs held Women's Group meetings prior to their general meetings, and six WUAs briefed their Women's Groups on the results of discussions in the general meetings to approve the PIDPs.

[6]	Promote further expansion fo the model

The original plan is to conduct activities for a total of 18 WUAs, including the two model sites (2 WUAs) of Stage 1 and the 16 WUAs targeted for model dissemination (expansion). And the progress is as follows as of February 2023.

- Winter 2020-21: PIDPs were formulated and implemented in 15 WUAs (2 model sites + 13 dissemination sites)
- Winter 2021-22: PIDPs were revised and implemented in 11 WUAs (2 model sites + 9 dissemination sites)
- Winter 2022-23: PIDPs were revised and implemented in 10 WUAs (2 model sites + 8 dissemination sites)
- Winter 2023-24: PIDPs were revised and being implemented in 19 WUAs (2 model sites + 17 extension sites)

The water scarcity situation, the transfer of WMT members, and the busyness of WMT members are the main reasons why the overall goal of 18 WUAs had not been achieved by the winter cropping season of 2022-23. Therefore, discussions were held between Japanese experts and the Iraqi side, and as a practical measure, it was recommended that 1) For the WMTs that are supporting the site facing difficulties in water share, if there is another WUA that water is available within their governorate, change the site; 2) For the WMTs that have successfully achieved the revision and implementation of the PIDP for the winter cropping season of 2022-23 in their governorate, select a second expansion site to formulate and implement the PIDP for the winter cropping season of 2023-24. As a result of the above discussion and recommendation, the number of PIDPs approved increased in the winter cropping season of 2023-24.

In addition, beyond the overall goal indicator, the CPs of the MoWR and MoA and the WMTs of each governorate discussed the policy to expand sustainable water management by WUAs to all irrigated areas in Iraq. As a result, it was confirmed that the policy is to shift from the establishment of WUAs targeting canals at the terminal level (and formulation, implementation, and revision of PIDPs) to the establishment of large-scale WUAs targeting higher-level canals (and formulation, implementation, and revision of

PIDPs).

Toward the realization of this policy, a revision of the WUA Instructions, which specifies the promotion of WUAs with a federated structure (large-scale WUAs), is in progress. In the future, it will be necessary to focus on the establishment of large-scale WUAs in those governorates where such efforts are possible, and to establish new WUAs and follow up on existing WUAs in other goverorates.

Regarding the large-scale WUAs, the following is described in the proposed revision of the WUA Instrcutions.

- Large-scale WUAs must have as their supreme body a general assembly as their supreme body consisiting of at least one representative from each of the distributary canals in the target area.
- Large-scale WUAs shall have a board body elected among the farmer representatives of distributary canals at the general assembly meeting.
- The number of farmer representatives of distributary canalsl and the number of members of the board body shall be determined by its by-laws.
- The MoWR shall appoint an official of DoWR as a manager of the large-scale WUA, and the WUA manager shall manage the large-scale WUA in consultation with the members of the Board in accordance with the PIDP approved by the general assembly.
- In the large-scale WUAs, operation, maintenance and management of the irrigation facilities in each distribary canal shall be handled by the farmer representative and constituent farmers of the canal, while operation, maintenance and management of the upper irrigation facilities including water distribution to the distributary canals shall be done by the large-scale WUA.

Since a farmer representative is assigned in each distributary canal as described above, each distributary canal can be considered a WUG (water users group) composed of the farmer representative and ther other beneficiary farmers. Therefore, one large-scale WUA will have a federated structure consisting of multiple WUGs. The irrigation network in Iraq generally consists of main canals, secondary canals, distribuary canals, watercourses, farm ditches and then farm fields. The WUG is assumed to be established either at each distributary canal or at each watercourse.

[3]	Review and advice for the WUA monitoring system

(1) Situation before the start of Stage 2 and outline of activities in Stage 2

In order to achieve further improvement of water management in Stage 1, WUA monitoring system with its manual has been developed for WMTs to evaluate WUAs using monitoring forms that describe five fields of water management: WUA management, maintenance, off-farm water management, on-farm water management, and facility planning. The system is outlined in the table below.

Table 2.8 Outline of WUA Monitoring System

Item	Contents
Purpose	To realize further improvement on water management and solve constraints of WUA based on the periodical monitoring results
Actor	WMT
Target	WUA which prepared PIDP

Item	Contents
Frequency	Once a year
Method of collecting information	WMT filled in necessary quantitative information on the WUA monitoring form through records kept by WUA and interviews with WUA board members.
Treatment of collected information	WUA monitoring form will be submitted to both MoWR (Head of WUA department) and MoA (Head of On-farm water management and WUA section) by WMT

The WUA monitoring system, as described in the table above, is assumed to be operated by the WMT, which is expected to monitor the water management status of WUAs that have developed PIDPs, and to encourage further improvement of water management by WUAs based on the monitoring results. In Stage 2, the operation status of the monitoring system was confirmed through the model expansion meeting and discussion with the main C/Ps for establishing and strengthening the operation of the system.

The monitoring items finalized in Stage 1 are shown in the table below, and a score is assigned to each item so that the overall score is 100 points.

Table 2.9 Monitoring Items in the WUA Monitoring Form

Field (Allocated score)	Sub-field	Monitoring item /indicator	Allocated score	Preferable Condition
WUA Management (30)	Bylaw & Participation	Bylaw	2	Bylaw should exist and be revised depending on necessity.
		Participation rate to WUA	4	A higher participation rate is desirable. To avoid free riders, the participation rate should be 100 %.
	Meeting	Frequency of Board meeting	2	Monthly or more is desirable.
		Attendance rate to Board meeting	2	A higher rate is desirable.
		Frequency of General meeting	2	Once a season or more is desirable.
		Attendance rate to General meeting	2	A higher rate is desirable.
		Approval of PIDP (Decision making)	4	Participatory Irrigation Development Plan (PIDP) should be approved in general meetings.
	OMM Subscription	OMM subscription	2	OMM subscription should be collected periodically, such as seasonally or monthly.
		Ratio of payers	4	A higher ratio is desirable.
		Ratio of Income / Expenditure	2	1.2 or more is desirable (Income is 20 % higher than expenditure for saving for future).
	Dispute Management	Dispute committee	2	The dispute committee is recommended to be formulated to manage disputes in the community.
	Gender	Participation in decision making	2	Participation in decision makings (attendance in general meetings) is highly preferable. Participation "through women's committee" also should be taken into consideration.
Maintenance (20)	Actor of Maintenance	O&M committee	6	O&M committee should be formulated for proper maintenance.
	Maintenance activities	Periodical inspection	6	Periodical inspection is required.

Field (Allocated score)	Sub-field	Monitoring item /indicator	Allocated score	Preferable Condition
		Necessary maintenance	8	Necessary maintenance should be carried out based on periodical inspection.
Off-farm Water Management (20)	Fair water distribution	Rule of water distribution	6	Rule of water distribution within the WUA area should exist.
		Ratio of followers	8	The water distribution rule should be followed by members.
	Efficient conveyance	Area of efficient conveyance methods	6	It is desirable that the area of efficient water conveyance methods would be expanded to the WUA area.
On-farm Water Management (20)	Irrigation Scheduling	Area of irrigation scheduling	8	It is desirable that the area of irrigation scheduling would be expanded to the WUA area.
	Water-Saving Methods	Area of water-saving irrigation methods	8	It is desirable that the area of water-saving irrigation methods would be expanded in the WUA area.
	Salinity	Area of anti-salinity	4	It is desirable that the area of anti-salinity methods would be expanded to the WUA area.
Facility planning (10)	Basic plan	Basic plan of improvement of facilities	10	It is desirable that a basic plan of improvement of irrigation facilities would be prepared.
Total			100	-

(2) **Results of activities in Stage 2**

Progress on the WUA monitoring system is as follows

- Since the end of Stage 1, the WUA Department of MoWR had not asked each WMT to submit the monitoring form. On the other hand, about four WMTs had voluntarily collected information from WUAs and updated monitoring forms.
- In consultation with the WUA Department of MoWR, it was decided that the WUA Department will encourage each WMT to submit the monitoring form before the second field work of the Japanese experts (January 2023).
- Subsequently, the monitoring forms were submitted by 16 WMTs for 16 sites (16 WUAs). For the two WMTs that did not submit the forms, the reasons for not submitting the forms were change of personnel (Wasit) and busy with other duties (Salah ud-Din).
- Out of the 16 sites submitted, one site (Diyala) was treated as unsubmitted because it was severely affected by water scarcity and irrigated agriculture was not conducted at all and, therefore, no accurate WUA information was available.
- Similarly, monitoring forms were submitted for 16 sites in the latter half of Stage 2.

Based on the above, a summary of the monitoring results (score of WUAs) for the 16 sites is shown in the table below. Even though monitoring forms were submitted, scores from years when water shortages were so severe that planting was almost impossible were excluded from the table. Namely, scores of the year 2021-22 in Missan (score: 45), 2020-21, 2021-22 and 2022-23 in Baghdad (scores: 44, 16 and 8) were

excluded from the following table. In addition, the new WUA sites were also excluded from the table because it is not possible to capture changes in scores over time.

Table 2.10 Summary of Monitoring Results (Score Transition by WUA)

SN	Governorate	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	Remarks
1	Anbar	-	38	38	44	47	41	44	
2	Babil.	22	31	46	50	59	60	65	
3	Diwaniya	-	-	-	43	67	71	61	
4	Salah ud-Din	-	-	-	-	-	-	-	Not submitted
5	Kirkuk	16	55	79	84	82	80	74	
6	Mabain Al-Nahreen	-	-	52	-	64	74	70	
7	Missan			34	48	69	Exclude	72	
8	Ninawa.	16	-	92	-	80	87	-	
9	Isaqi.	-	-	57	64	67	84	87	
10	Baghdad	51	64	64	67	Exclude	Exclude	Exclude	
11	Diyala	-	-	-	-	-	-	-	No accurate information
12	Najaf	-	51	-	85	-	92	92	
13	Karbala	-	-	-	41	-	62	52	
14	Musaiab	-	-	-	26	60	75	-	
15	Wasit.	-	41	-	-	-	64	71	
16	Muthanna	-	-	-	45	62	57	-	
17	Basrah	26	49	79	83	85	85	85	
18	Dhi-Qar	-	44	67	71	55	70	69	
Average Score		26	47	61	58	66	72	70	

The following chart illustrates change of the average scores of the 16 WUAs in the table above.

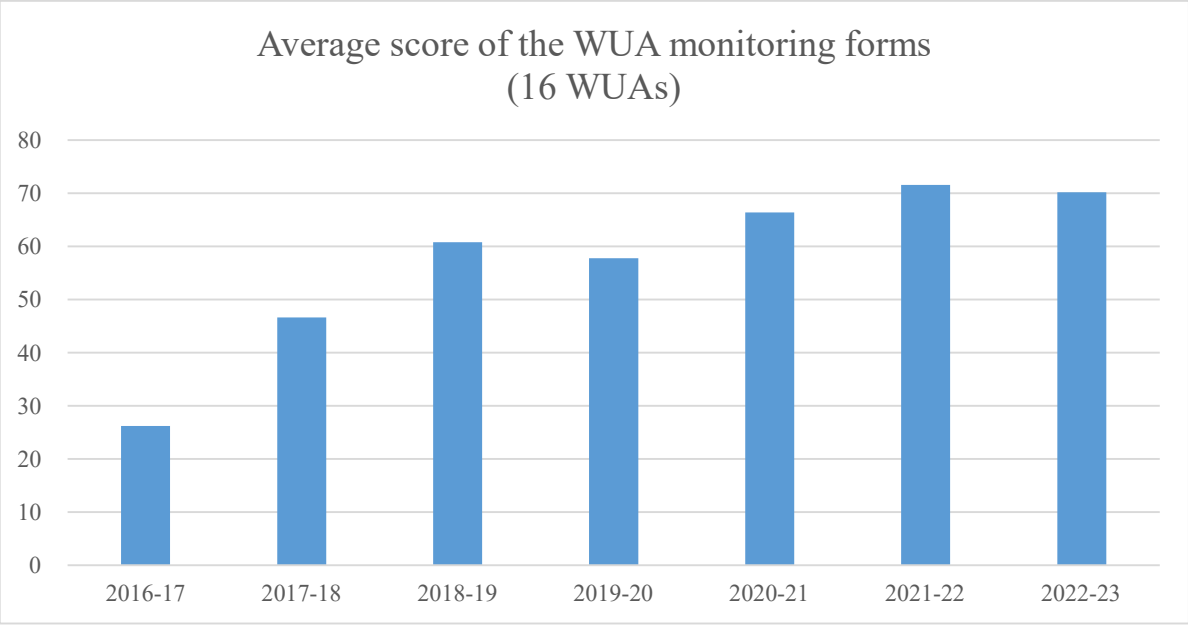


Figure 2.1 Summary of monitoring results (Change of average socres of 16 WUAs)

The followings can be noted from the above table and figure

- For all 16 sites, a comparison of each site's initial score to its most recent score showed an improvement in score.
- In terms of the degree of score increase from the initial to the latest score, three sites had scores of less than 130%, seven sites had scores between 130% and 200%, and seven sites had scores of more than 200%.

Details of the monitoring results for the 16 sites (change of the average score for each indicator at the 16 sites) are as follows

<Indicators and Scores for WUA Management>

The indicators and score allocation for WUA management (30 points in total) are shown in the table below.

Table 2.11 Indicators and Scores for WUA management

Sub-category	Monitoring item /indicator	Allocated Score	Status of Water Management				
			[Good]				[Bad]
Bylaw and participation	Bylaw	2	Exist	-	-	-	Not exist
			2	-	-	-	0
	Participation rate to WUA	4	100%.	99-90	89-70%.	69-40%.	39-0%
			4	3	2	1	0
Meeting	Frequency of Board meeting	2	Monthly or more	-	Every 2 months	-	Less than every 2 months
			2	-	1	-	0
	Attendance rate to Board meeting	2	100-70	-	69-50%.	-	49-0%
			2	-	1	-	0
	Frequency of General meeting	2	Once a season or more	-	Once a year	-	Less than once a year
			2	-	1	-	0
	Attendance rate to General meeting	2	100-70	-	69-50%.	-	49-0%
			2	-	1	-	0
	Approval of PIDP (Decision making)	4	Yes	-	-	-	No
			4	-	-	-	0
OMM subscription	OMM subscription	2	With subscription	-	-	-	Without subscription
			2	-	-	-	0
	Ratio of payers	4	100%.	99-90	89-70%.	69-40%.	39-0%
			4	3	2	1	0
	Ratio of	2	1.2 or more	-	1 to 1.19	-	Less than 1

	Income / Expenditure		2	-	1	-	0
Dispute Management	Dispute committee	2	Exist	-	-	-	Not exist
			2	-	-	-	0
Gender	Participation in decision making	2	Yes	-	-	-	No
			2	-	-	-	0

The table below shows the change of the average score for each indicator related to WUA management in the 16 sites.

Table 2.12 Average Scores for WUA management

	Allocated score	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Bylaw	2	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Participation rate to WUA	4	2.0	3.1	2.8	2.9	2.5	2.9	3.0
Frequency of Board meeting	2	0.6	1.4	1.6	1.7	1.5	1.7	1.8
Attendance rate to Board meeting	2	1.0	1.9	1.8	1.8	1.6	1.7	1.8
Frequency of General meeting	2	0.6	1.6	1.8	1.4	1.4	1.8	1.8
Attendance rate to General meeting	2	0.8	1.1	1.3	1.2	1.3	1.4	1.4
Approval of PIDP (Decision making)	4	0.0	0.0	2.0	2.2	3.3	3.4	3.3
OMM subscription	2	1.2	1.3	1.4	1.2	1.8	1.7	1.5
Ratio of payers	4	0.8	2.8	2.4	2.5	2.9	3.0	2.8
Ratio of Income / Expenditure	2	0.0	1.0	1.1	1.2	1.3	1.1	1.0
Dispute committee	2	1.6	1.0	1.2	1.2	1.8	1.5	1.5
Participation in decision making (Gender)	2	0.0	0.0	0.4	0.3	0.5	0.4	0.5
Total	30	10.6	17.1	19.8	19.5	22.1	22.6	22.4

With regard to the above table, special remarks are as follows

- Improvement was observed in the average scores between the year 2016-17 and 2021-22 for participation rate (membership rate) to WUA, frequency and attendance rate to board meeting, frequency and attendance rate to general meeting, approval of PIDP, OMM subscription, ratio of payers for OMM subscription, the ratio of income and expenditure, and dispute committee.
- Regarding the bylaw, all WUAs had bylaw prior to the project intervention and there was no change in the score.
- The average score for participation in decision-making (Gender) is relatively low because 11 out of the 16 sites submitted an outdated-monitoring form that did not include this indicator. Therefore, these 11 sites were given a score of zero for this indicator.

<Indicators and Scores for Maintenance>

The indicators and score allocation for maintenance (20 points in total) are shown in the table below.

Table 2.13 Indicators and Scores for Maintenance

Sub-category	Monitoring item /indicator	Allocated Score	Status of Water Management				
			[Good]				[Bad]
Actor of Maintenance	O&M committee	6	Exist	-	-	-	Not exist
			6	-	-	-	0
Activities of Maintenance	Periodical inspection	6	Done	-	Partially done	-	Not done
			6	-	3	-	0
	Necessary maintenance	8	Done	-	Partially done	-	Not done
			8	-	4	-	0

The table below shows the change of the average score for each indicator related to Maintenance in the 16 sites.

Table 2.14 Average Scores for Maintenance

	Allocated score	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
O&M committee	6	0.0	2.3	3.0	3.2	5.0	5.1	5.0
Periodical inspection	6	0.0	2.3	4.2	4.2	5.0	5.8	5.8
Necessary maintenance	8	3.2	5.5	6.4	6.2	7.0	7.1	7.0
Total	20	3.2	10.0	13.6	13.5	17.0	18.1	17.8

With regard to the above table, special remarks are as follows

- Improvement was observed in the average score from the year 2016-17 to 2021-22 for all three indicators: O&M committee, periodical inspection, and necessary maintenance.
- In particular, O&M committee and periodical inspection can be called a new initiative in the category of maintenance, as evidenced by a score of 0 for 2016-17.

<Indicators and scores for off-farm water management>

The indicators and score allocation for off-farm water management (20 points in total) are shown in the table below.

Table 2.15 Indicators and Scores for Off-farm Water Management

Sub-category	Monitoring item /indicator	Allocated Score	Status of Water Management				
			[Good]				[Bad]
Fair water distribution	Rule of water distribution	6	Exist	-	-	-	Not exist
			6	-	-	-	0

	Ratio of followers of the rule	8	100%.	99-90	89-70%.	69-40%.	39-0%
			8	6	4	2	0
Efficient water conveyance	Area of efficient conveyance	6	30% or more	29-15%.	14-5%.	4-1%.	0
			6	4	3	2	0

The table below shows the change of the average score for each indicator related to off-farm water management in the 16 sites.

Table 2.16 Average Scores for Off-farm Water Management

	Allocated score	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Rule of water distribution	6	2.4	3.0	5.4	5.5	6.0	6.0	6.0
Ratio of followers of the rule	8	3.2	6.0	6.6	6.8	7.7	7.9	8.0
Area of efficient conveyance	6	1.2	3.0	3.0	2.8	2.5	2.9	2.7
Total	20	6.8	12.0	15.0	15.1	16.2	16.7	16.7

With regard to the above table, special remarks are as follows

- Improvement was observed in the average scores from the year 2016-17 to 2021-22 for all three indicators: rule of water distribution, ratio of followers of the water distribution rule, and area of efficient water conveyance.
- In particular, rule of water distribution and ratio of followers of the rule are the most important functions of the WUA, and the steady improvement in these scores is highly evaluated.

<Indicators and scores for on-farm water management>

The indicators and score allocation for on-farm water management (20 points in total) are shown in the table below.

Table 2.17 Indicators and Scores for On-farm Water Management

Sub-category	Monitoring item /indicator	Allocated Score	Status of Water Management				
			[Good]				[Bad]
Irrigation scheduling	Area of irrigation scheduling	8	30% or more	29-15%.	14-5%.	4-1%.	0
			8	6	4	2	0
Water saving irrigation method	Area of water saving irrigation	8	30% or more	29-15%.	14-5%.	4-1%.	0
			8	6	4	2	0
Salinity	Area of anti-salinity	4	30% or more	29-15%.	14-5%.	4-1%.	0
			4	3	2	1	0

The table below shows the change of the average score for each indicator related to on-farm water management in the 16 sites.

Table 2.18 Average Scores for On-farm Water Management

	Allocated score	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Area of irrigation scheduling	8	1.0	0.9	2.2	2.5	2.5	3.7	2.2
Area of water saving irrigation	8	2.2	4.0	4.5	4.5	4.7	5.7	6.4
Area of anti-salinity	4	0.0	0.0	0.0	0.1	0.1	0.1	0.0
Total	20	3.2	4.9	6.6	7.0	7.3	9.5	8.5

With regard to the above table, special remarks are as follows

- Improvement was observed in the average scores from the year 2016-17 to 2022-23 for the indicator of the area covered by water-saving irrigation methods.
- The score of irrigation scheduling for 2022-23 was down from the previous year, but this is due to some WUAs/farmers not implementing irrigation scheduling due to water shortages.
- For the area covered by anti-salinity measures, no specific action was taken in Stage 1 and almost no improvement was observed in the score.

<Indicators and Scores for Facility Planning

The indicators and score allocation for facility planning (20 points in total) are shown in the table below.

Table 2.19 Indicators and Scores for Facility Planning

Sub-category	Monitoring item /indicator	Allocated Score	Status of Water Management				
			[Good]				[Bad]
Basic plan	Basic plan of improvement of irrigation facilities	10	Yes	-	Under preparation	-	No
			10	-	5	-	0

The table below shows the change of the average score for each indicator related to facility planning in the 15 sites.

Table 2.20 Average Scores for Facility Planning

	Allocated score	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Basic plan of improvement of irrigation facilities	10	0.0	1.3	4.0	3.1	4.2	5.4	4.2
Total	10	0.0	1.3	4.0	3.1	4.2	5.4	4.2

With regard to the above table, special remarks are as follows

- Improvement was observed in the average score from the year 2016-17 to 2021-22 for the indicator of basic plan of improvement of irrigation facilities.
- This is an indicator of whether or not the WUA has ideas for future necessary facility improvement, and can be said to be an important indicator for appropriate facility improvement.

[4]	Review and advice for the training systems

(1) Situation before the start of Stage 2 and outline of activities in Stage 2

The training systems for WMTs and WUAs were developed in Stage1; the training system for WUAs is intended to be operated by WMTs, and the program is shown in the table below.

Table 2.21 Program of the WUA Training System

Item	Contents
Purpose	Capacity development of selected WUAs in 15 governorates to formulate and implement PIDP
Target	Board members in selected WUAs (General members can be included when necessary)
Contents	Periodical visit and support to WUA by WMT (2 times or more in a month) Provision of trainings
Subjects	Participatory Irrigation Development Plan (PIDP) WUA Management Maintenance of Irrigation Facilities Off-farm Water Management On-farm Water Management
Target period	Baseline survey: 6 months (Including preparation of the survey report) Preparation and approval of the PIDP: 4 months Implementation of PIDP: 2 years

On the other hand, the training system for WMTs is intended to be operated by the Ministry, and its program is shown in the table below.

Table 2.22 Training Program of the WMT Training System

Item	Contents
Purpose	Capacity development of 18 WMTs to expand the water management model to whole Iraq
Target	18 WMTs (156 members)
Training Courses	WM-1: Basic course on 6 manuals for water management model (10 consecutive days) WM-2: Basic Course on study tour to the model sites (4 consecutive days) WM-3: Advance Course on water management model expansion meeting (6 days in total)
Trainees	24 trainees (4 members x 6 WMTs) per course
Number of Courses per Year	WM-1: 1 batch WM-2: 1 batch WM-3: 3 batches (=18WMTs)
Target Period	3 years from 2021 to 2023

(2) Results of activities in Stage 2 (Status of implementation of the training systems)

The WUA training system was being implemented by the WMTs to WUAs as appropriate in the PIDP formulation, implementation, and revision process.

On the other hand, for the WMT training system, the WUA Department of MoWR took the lead in preparing an annual implementation plan starting in 2022. 2022 implementation plan is positioned as a basic course for all governorates with one batch per governorate. Each batch consists of about 20 participants, and each batch lasts for five days. The contents of the basic course are shown in the table

below, including participatory irrigation management, WUA-related laws, the main points of the manual prepared in Stage 1 (basics of PIDP), and lessons learned from the training in Japan.

Although the training program developed in Stage 1 was specialized in content with the main objective of disseminating the water management model, the course content was restructured to include basic content, taking into account that the prospective participants include those who have no knowledge of WUAs.

Table 2.23 Contents of the Basic Course

Item	Contents
Course Content	- What is the participation in irrigation water management? - Why participation in irrigation water management in Iraq? - Water Users Associations - Legal Framework - Degrees of participation of water users in irrigation water management - Requirements for the successful participation of water user associations in irrigation water management - Conditions of irrigation water management transfer - Levels of water user association establishment within the irrigation network - Examples of the options in the level of establishment of water users associations - Empowering of Water User Associations - Main areas of development and empowerment for water user associations - Preparing of WUA development plan (PIDP) - Participants test - Course evaluation
Days/Courses	5 days

The implementation plan for 2022 is as shown in the table below.

Table 2.24 Training Course Implementation Plan (2022)

NO	Training Course Name	Location	Scheduled date	Duration
1	Participation of Water Users in Irrigation Management	Baghdad	13-Mar-22	5days
2	Participation of Water Users in Irrigation Management	DoWR/ Wasit	20-Mar-22	5days
3	Participation of Water Users in Irrigation Management	DoWR/ Babil	27-Mar-22	5days
4	Participation of Water Users in Irrigation Management	DoWR/ Basra	8-May-22	5days
5	Participation of Water Users in Irrigation Management	DoWR/ Dhi-Qar	15-May-22	5days
6	Participation of Water Users in Irrigation Management	DoWR/ Al-Diwaniya	22-May-22	5days
7	Participation of Water Users in Irrigation Management	DoWR/ Diyala	29-May-22	5days
8	Participation of Water Users in Irrigation Management	DoWR/ Missan	5-Jun-22	5days
9	Participation of Water Users in Irrigation Management	DoWR/ Al-Najef	12-Jun-22	5days
10	Participation of Water Users in Irrigation Management	DoWR/ Al-Mathanna	19-Jun-22	5days
11	Participation of Water Users in Irrigation Management	DoWR/ Karbala	26-Jun-22	5days

NO	Training Course Name	Location	Scheduled date	Duration
12	Participation of Water Users in Irrigation Management	DoWR/ Ninawa	3-Jul-22	5days
13	Participation of Water Users in Irrigation Management	DoWR/ Kikuk	17-Jul-22	5days
14	Participation of Water Users in Irrigation Management	DoWR/ Salah Al-Deen	24-Jul-22	5days
15	Participation of Water Users in Irrigation Management	DoWR/ Mabaian Al-Nahreen	31-Jul-22	5days
16	Participation of Water Users in Irrigation Management	DoWR/ Anbar	14-Aug-22	5days
17	Participation of Water Users in Irrigation Management	DoWR/ Ishaqi	21-Aug-22	5days
18	Participation of Water Users in Irrigation Management	DoWR/ Al-Musaiab	28-Aug-22	5days

The results of the implementation of the above plan are shown in the table below.

Table 2.25 Results of Training Course Implementation (2022 and 2023)

	Target	Month of implementation	Duration	Total number of participants	Number of participants (MoWR/DoWR)	Number of participants (MoA/DoA)	Achievement Test Scores
1	Baghdad	March 2022	5 days	21	13	8	88
2	Wasit.	June 2022	5 days	21	16	5	78
3	Babil.	September 2022	5 days	23	12	11	87
4	Kirkuk	October 2022	5 days	19	17	2	79
5	Diwaniya	March 2023	5 days	19	15	4	78
6	Missan	June 2023	5 days	16	14	2	83
7	Ninawa	August 2023	5 days	24	19	5	80
8	Muthanna	October 2023	5 days	22	15	7	80
Total				165	121	44	82 (average)

As described in the table above, only eight of the 18 planned training batches were conducted. The main reason for the low number of training batches was the difficulty in scheduling the training dates due to the participants' other commitments.

On the other hand, the following points can be evaluated positively.

- All trainings were planned and implemented solely by the Iraqi side without any assistance of Japanese experts.
- The training system developed in Stage 1 was customized and implemented by the Iraqi side themselves.
- All trainings were conducted by MoWR, but MoA also collaborated with MoWR, and approximately 30% of the participants were from MoA/DoA side.

2.2.3 Activities related to Output 2: Policy paper prepared in Stage 1 is implemented.

The activities related to Output 2 are indicated by [7] through [9] in the flowchart in 2.1, and their respective activities are described below. Note that activities [7] and [8] are described in one item.

[7]	Review the progress of the policy paper
[8]	Realize the policy paper

(1) Situation before the start of Stage 2 and outline of activities in Stage 2

In Stage1, the policy paper was prepared to strengthening the WUA system in Iraq. It includes 4 recommdendations, namely, 1) Promotion of multi-layered WUAs (Large-scale WUAs), 2) Governmental set-up for supporting WUAs, 3) Define WUA as a precondition of facility improvement, and 4) Compulsory membership. The recommendations and expected outputs are shown in the table below.

Table 2.26 Outline of the Recommended Policies on WUA

Item	Contents	Expected Output
Policy 1: Promotion of multi-layered WUAs	O&M by government and multi-layered WUAs is promoted in the upper level of canals, in addition to O&M by WUAs which is mainly promoted in the tertiary level of canals.	The promotion of multi-layered WUAs means that WUAs would be established in 142 large-scale irrigation projects in Iraq. As a result, it is expected to 1) break out of random establishment of WUA in the tertiary level of canals, 2) participate in O&M in the upper level of canals by WUA, and 3) accelerate the increase of covering ratio of WUA in irrigation system in Iraq.
Policy 2: Governmental set-up for supporting WUAs	(1) Add WUA activities in ToR of "District office" of DoWR and DoA (new) (2) Establish On-farm WM and WUA section in DoAs (ongoing now)	By adding work for WUA in the ToR of each district office of DoWR and DoA, it is expected to increase the number and quality of WUAs in Iraq. Both WUA sections of DoWR and DoA will be in charge of work to support district offices.
Policy 3: Define WUA as a precondition of facility improvement	Prerequisite conditions to improve irrigation facilities are set as follows. (1) Establish WUA & 2/3 (or 100%) membership (2) Agree on OMM responsibilities by WUA, etc.	By defining WUA as a precondition of facility improvement, it is expected to 1) steadily increase the number of WUAs following facility improvement and 2) promote acceptance of OMM responsibility by WUA by utilizing the benefit of facility improvement.
Policy 4: Compulsory membership	A compulsory membership system is introduced with a certain condition.	It is expected to eliminate free riders on the service provided by WUA.

This proposal was signed by the directors of both MoWR and MoA in January 2021, and as of February 2021, was being prepared for submission to the Opinion Commission of both ministries (a meeting body consisting of the minister and all directors).

In Stage 2, the subsequent progress within the Iraqi government was reviewed, and follow-up was conducted as appropriate to ensure policy realization.

(2) Results of activities in Stage 2

Progress for realization of the recommended policies is as follows

- The policy paper was submitted twice in 2021 to the Opinion Commission of MoWR. No conclusion

was obtained.

- On the other hand, a committee to revise the "WUA instructions" has been established in MoWR, and through the activities of this committee, a revised proposal of the WUA instructions was prepared and shared with the Japanese experts by the end of October 2022.
- The Japanese experts reviewed the revised proposal and made the necessary modifications, which were explained in an online meeting to Iraqi side in December 2022.
- Based on the revised proposal by the Japanese experts, the Iraqi side prepared the final-draft Ver.1 in January 2023.In the final draft, three of the four policies proposed in Stage 1 were included: 1) Promotion of multi-layered WUAs (Large-scale WUAs), 2) Define WUA as a precondition of facility improvement, and 3) Compulsory membership (the final-draft Ver. 1 is refered to the Attachment 3).
- The amendment was approved on August 4, 2023 by the Opinion commission of the MoWR (a meeting body composed of the Minister of Water Resources and the heads of all departments of the Ministry). It was then sent to the external State Council, which has independence from the MoWR, on September 19, and two rounds of consultation between the State Council and the Legal Department of the MoWR have been conducted by the end of November. The proposed amendments are expected to be promulgated in the fall of 2024.
- Note that the WUA Instructions is positioned as a subordinate legal form of the Irrigation and drainage networks maintenance law (The Law No. 12) and does not require parliamentary approval. The proposed policy will be realized and institutionalized when the amendment is completed.
- See the next section for information on Governmental set-up for supporting WUAs, which is not included in the revised proposal of the WUA instructions.

In relation to policy realization, courtesy calls were made to the policy makers listed in the table below. The common items explained in the courtesy calls were: 1) Direction of Stage 2 based on the Stage 1 results, 2) basic functions of WUA, and 3) the need to realize the proposed policies.

All of the courtesy recipients shared the recognition of the importance of strengthening WUA system in light of the water crisis situation. They also indicated that they would provide necessary support to strengthen WUAs, including policy implementation. Matters specifically requested according to the courtesy targets are shown in the table below.

Table 2.27 Special Requests according to the Coutesy Recipients

Courtesy Recipient (Courtesy date)	Requested Items
Water Resources and Agriculture Sector Representatives of PMAC (26th of July, 2022)	Request for support for strengthening WUA system in general
Director General, State	Request for support for strengthening WUA system in general

Courtesy Recipient (Courtesy date)	Requested Items
Commission for Maintenance, MoWR (26th of July, 2022)	
Deputy Minister of MoWR (27th of July, 2022)	Requests support for the activities of the committee to revise the "WUA instructions"
Deputy Minister of MoA (28th of July, 2022)	Request for support for Policy No.2 (Governmental set-up for supporting WUAs)
Office of Finance and Administration, MoA (28th of July, 2022)	Request for support for necessary expenditures related to WUA-related activities
Director General, Reclamation Office, MoWR (24th of January, 2023)	Request for support for strengthening WUA system in general
Director General, State Commsion for Operations, MoWR and Director Generals, DoWRs (25th of January, 2023)	Request for support for necessary expenditures related to WUA-related activities
Minister of MoWR (29th of January, 2023)	Request the following supports ● To complete revision of the WUA instructions ● To position the promotion of WUA as one of the main policies for responding to the water crisis with written document ● To inform all DGs of MoWR about the importance of WUA
Parliament members (Agriculture and Irrigation Sector Committee) (31st of January, 2023)	Request to position the promotion of WUA as one of the main policies for responding to the water crisis with written document
Minister and Deputy Minister of MoA (1st of January, 2023)	Request the following supports ● To introduce equipments for improved surface irrigation and to introduce subsidy system for the same equipment ● To complete establishment of “On-farm water management and WUA section” in all DoAs
Ambassador of the Embassy of Japan in Iraq (1st of February, 2023)	Request for support for strengthening WUA system in general
Chairman of PMAC (Prime Minister's Advisory Council) (24th of May, 2023)	● If irrigation facility rehabilitation and water-saving irrigation are positioned as hardware, WUA can be positioned as its counterpart, software. The importance of WUA as software should be clearly stated in the next national development plan and other policy documents. ● In addition, the possibility of creating an opportunity to appeal the importance of WUA to the Prime Minister was dicussed. The PMAC and the MoWR will discuss the possibility of creating such an opportunity during the next field work. ● The above was discussed with the person in charge of the Irrigation and Agriculture Sector. The Chairperson of the PMAC was too busy to make any remarks at the end of the meeting.
Minister of MoWR (24th of May, 2023)	● Request early implementation of Opinion commission meeting to revise the WUA Instructions →Received a response from the Minister that he would like to hold it as soon as possible. ● Request to increase the number of staff in the WUA Department of the MoWR and the WUA Section of the DoWR

Courtesy Recipient (Courtesy date)	Requested Items
	→The Minister requested the WUA Section to submit a proposal for the increase in the number of staff. ● Request that WUA be included in the National Development Plan 2023-27 →Minister instructed to include WUA promotion in the draft of the National Development Plan 2023-27.
Minister of MoWR and Technical Deputy Minister of MoA (20th of August, 2023)	● Japan is implementing a technical cooperation project to strengthen the WUA system in Iraq, in addition to the loan project to build and rehabilitate irrigation facilities. In this way, it is important to combine both hardware and software. ● As for WUA, the model site succeeded in saving 35% water and increasing yields by 43% to 3,000 dongam in three years. This was not achieved through the provision of improved surface irrigation equipment (LLL and MCBP) and materials alone, but through the proper functioning of the WUA. ● A graphical explanation of the estimated wheat production if the model of "WUA + improved surface irrigation" were spread over the entire wheat-growing area of Iraq. It shows that if the "WUA+ improved surface irrigation" model is spread throughout Iraq, it is possible to obtain the same or higher yields than before the water crisis, even under conditions where only 50% of the irrigation water is available due to the water crisis. ● Based on the above recognition, it was recommended to set a target for the expansion of WUA coverage and provide technical and financial support for the dissemination of improved surface irrigation through the WUA. ● The importance of "WUA + improved surface irrigation" was well understood by the Minister of Water Resources and the Technical Deputy Minister of Agriculture.
Administrative Deputy Minister of MoA and Technical Deputy Minister of MoA (30th of August, 2023)	● Discussed with slides used in discussions with the Minister of Water Resources and the Deputy Technical Minister of Agriculture to foster common understanding including the Administrative Deputy Minister of Agriculture. ● In particular, exchanged views on the possibility of establishing a subsidy system for LLL. ● Administrative Deputy Minister of Agriculture and a person in charge of the state company in the Ministry responded that it is possible to provide subsidies for LLL within the framework of the current system, and that if WUAs (farmers) apply for a commitment to purchase at 50% subsidy, they will be given priority. →After the meeting, the working-level officials from the MoWR and the MoA discussed (Aug. 31) and confirmed that they would work together to obtain LLL subsidies through the WUA in the future.
Administrative Deputy Minister of MoA (6th of December, 2023)	● The Japanese expert team presented a summary of Stage 2 results. Specifically, the team reported on the results of the dissemination of the water management model, the predicted wheat yield under the water crisis as a result of the dissemination of the model, the effectiveness and cost comparison of LLL compared to sprinklers, and the progress of the revision of the WUA Instructions. ● Recommendations were made regarding activities and organizational improvements that the Iraqi side should undertake after the completion of Stage 2. ● The Deputy Minister of Agriculture expressed his satisfaction with the results and achievements of Stage 2 and his gratitude. He also stated that he would accept the recommendations positively and continue to

Courtesy Recipient (Courtesy date)	Requested Items
	address them in the future.
Minister of MoWR (7th of December, 2023)	● The Japanese expert team presented a summary of Stage 2 results. Specifically, the team reported on the results of the dissemination of the water management model, the predicted wheat yield under the water crisis as a result of the dissemination of the model, the effectiveness and cost comparison of LLL compared to sprinklers, and the progress of the revision of the WUA Instructions. ● Recommendations were made regarding activities and organizational improvements that the Iraqi side should undertake after the completion of Stage 2. ● The Minister of Water Resources expressed his satisfaction with the results and achievements of Stage 2 and his gratitude, and also stated that he would accept the recommendations positively and continue to address them in the future.

[9]	Strengthening of the implementation system

(1) Situation before the start of Stage 2 and outline of activities in Stage 2

In this project, there are two counterpart agencies: MoWR, which is responsible for off-farm water management, and MoA, which is responsible for on-farm water management.

At the central-governmental level, the departments in charge of WUA are the WUA department under the State Commission of Operation Irrigation and Drainage Projects for MoWR and the Section for On-Farm Water Management and WUA under the Planning and Follow-Up Office for MoA.

At the governorate level, 18 WMTs have been formed in 15 govermorates to promote WUA, and each WMT consists of 8 to 10 members, including 4 to 5 staff of DoWR and 4 to 5 staff of DoA.

The WMT members are responsible for promoting WUA while performing their original duties in their respective departments, with the exception of one member who belongs to the "WUA Section" of DoWR. Therefore, actions were taken to establish a permanent organization for WUA in each DoA, and by the end of Stage 1, "On-farm Water Management and WUA Section" had been established in 10 DoAs.

In Stage 2, the status of coordination between MoWR and MoA at the central level was reviewed and effective collaboration was encouraged. The status of the establishment of On-farm Water Management and WUA Section in each DoA was also checked, and countermeasure was also discussed to ensure that a person in charge of WUA work is assigned to each district office of DoWR and DoA.

(2) Results of activities in Stage 2

Regarding the organizational structure at the governorate level, progress was made at DoWRs, where one WUA officer was assigned to each district office by ministerial order. On the other hand, there has been no significant progress in DoAs, and action is needed to overcome the situation. At the central level, a new WUA Department under the Planning Office of the MoWR was established in November 2022. This enables WUA activities to be promoted more strongly than before in cooperation with the WUA Department under the State Commission of MoWR.

On the other hand, there had been no significant progress in strengthening the organizational structure at the governorate level of the MoA, and action was needed to overcome the situation.

In light of the above situation, when a courtesy call to the Deputy Minister of Agriculture was conducted in February 2023, the need and support for the establishment of sections and units in regional offices in each governorates was directly requested. In consultation with the CPs on the MoA, it was also decided that the MoA would issue a letter to the Director General of the DoA who had not yet established a section, urging him to establish a section.

Subsequently, a letter from the MoA was issued and a section was established in Kakbala. However, two of the remaining four governorates (Diyala and DhiQar) had already established units that were not yet sections, while the remaining two governorates (Muthanna and Diwaniya) had neither sections nor units. The main reason for this is that, unlike the MoWR, the MoA is decentralized, so it is not possible for the MoA to issue "instructions" to the DoA to establish sections, but only "recommendations" for establishment. Subsequently, in the case of Diyala governorate, an application for the establishment of a section has already been submitted to the local government by the DG of the DoA through follow-up by the MoA, and similarly, in the case of the other three governorates, the MoA is following up the DoAs to submit an application for the establishment of a section to the local government.

Table 2.28 Status of establishment of On-farm Water Management and WUA section/Unit in each DoA

DoA	Governorate HQ office
	Section/Unit/None
Salah ud-Din	Section
Ninevah	Section
Kirkuk	Section
Babil	Section
Najaf	Section
Karbala	Section
Diyala	Unit
Anbar	Section
Baghdad	Section
Missan	Section
Wasit	Section
Muthanna	None
Diwaniya	None
Basrah	Section
Dhi-Qar	Unit

Note: At the end of Stage 1, Baghdad had been divided into two directorates, Baghdad Al-Karkh (Mabain Al-Nahrain) and Baghdad Al-Rusafa, which are now integrated into one directorate, Baghdad.
Note: Salah ud-Din and Babil have Ishaqi and Musayab as district respectiviely.

Chapter 3 Challenges, Measures and Lessons of Project Operation

The following responses and measures were taken to address the challenges faced in implementing this project. In addition, the lessons learned from the corresponding measures are also be noted.

(1) Promotion of model expansion

Challenge In Stage 1, a water management model was developed through activities at two model sites. In Stage 2, the challenge was how to disseminate the model.

Measure In Stage 1, in preparation for model (technique) expansion, techniques to be disseminated have been clarified, and governmental officials (WMTs) are provided opportunities to acquire the techniques through training in the third country. In Stage 2, model expansion meetings (ME meetings) consisting of the following six elements were held every visit of Japanese Experts, and through this the model was disseminated nationwide.

Item	Content
Regular contact with WMTs	A regular meeting (ME meeting) between WMT members and the project side was set and held every 3 to 4 months.
Atmosphere of friendly competition	WMT members from multiple governorates were invited to participate in model expansion meetings at the same time so that they could improve themselves through friendly competition.
Making the content routine	In principle, each model expansion meeting consisted of 1) confirming the progress of dissemination till the time of meeting, and 2) giving homework to be done until the next expansion meeting.
Emphasis on fact-checking	When confirming the progress of dissemination in the ME meeting, it was tried to ask the facts of past implementations, rather than the thoughts or ideas of the WMT members (it was done by using meta-facilitation techniques).
Presenting goals for next time	Goals (homework) were set out to be completed by WMT members until the next ME meeting.
Transfer to C/P	Role for conducting a ME meeting was gradually transferred to the C/P so that the ME meeting was conducted mainly by the C/P.

As a result of the above ME meetings, in 19 WUAs, the PIDP was approved at the general meeting and implemented for the winter cropping season of 2023-2024. It can be said that these results attributed to be the results of the steady dissemination activities by WMT members, and it can also be said the ME meeting was the platform that promoted these dissemination activities.

Lesson When disseminating the model established through the project activities to the other areas, model expansion meetings are useful as a method of promoting dissemination. When planning and implementing a model expansion meeting, the following six points are required to include for effective dissemination: 1) regular contact with those involved in dissemination, 2) an atmosphere/environment for friendly competition, 3) making the content routine, 4) emphasis on fact-checking and 5) presentation of goals for the next time, 6) transferring of responsibilities to C/P. These lessons can be applied to the other technical cooperation as which is being aimed at clarifying dissemination technologies and disseminating them.

(2) Realization of WUA policy

Challenge While strengthening the system of participatory water management (WUA system), the following challenges were raised from the WMT members who are working on the ground: 1) it is difficult to make farmers at upstream involved in WUA, and 2) if a WUA is established after the construction or rehabilitation of irrigation facilities, it is difficult for the WUA to accept O&M (operation and maintenance) responsibility of the irrigation facilities. In addition, there are cases where WUAs are established targeting large-scale irrigation areas, and strengthening their management is an issue in Iraq. On the other hand, examples of participatory water management in Turkey and Sudan, which belong to Islamic countries like Iraq, have achieved results in strengthening participatory water management by assigning a governmental offical to the WUA and adopting a joint management system between the government and farmers for the large-scale irrigation area, rather than making the WUA a complete farmers' organization.

Measure In order to address the above challenges, it is proposed to revise the WUA instructions, in which the following points are clearly stipulated: 1) Farmers who do not agree to participate in a WUA (mainly in upstream areas) will become automatically members when some condition is fulfilled (e.g., two third of farmers in the area is participating in the WUA); 2) When the government constructs or rehabilitates irrigation facilities, farmers must be involved from the planning stage and establishment of a WUA is a prerequisite; and 3) the government assigns a governmental official as a WUA manager to a WUA in large-scale irrigation area (This revision of WUA instruction is under way, but not yet been completed).

Lesson In order to strengthen the system of participatory water management (WUA system), it is necessary to check the content of the country's laws that support participatory water management, in addition to work in forming technical models that can be disseminated through field activities, and it may be effective to make proposals for legal reform in accordance with the necessities. When doing it, rather than simply applying the laws of Japan or other countries as it is, it is necessary to grasp the issues that are occurring at the field level in the country, and after through consultation with the practitioners in the country, and it is also necessary to consider what to be included in the revised law. These lessons can be applied to the other technical cooperation projects related to strengthening participatory irrigation management.

(3) Promoting collaboration between the Ministry of Water Resources and the Ministry of Agriculture

Challenge In Iraq, water management from water sources to fields is under the jurisdiction of the MoWR, and that of inside the fields is under the jurisdiction of the MoA. The challenge was how to promote collaboration between the two ministries in order to strengthen irrigation water management.

Measure Whenever the experts traveled to Iraq, working-level officials at the HQ level from the MoWR and the MoA were present to discuss various matters related to WUA extensively. At the governorate (field) level, WMTs consisting of staff from the DoWR and the DoA were formed by ministerial order during the Stage 1, and in the ME meetings which were held each time when the Japanese experts traveled to Iraq, it was tried to motivate those two directorate staffs to work together to provide necessary support to WUA. Through these activities, the recognition that collaboration between the two ministries is essential and natural is becoming commonly understood among working-level officials at the HQ level and governorate level officials. The importance of collaboration between the two ministries was also explained at every opportunity in discussions with policy decision-makers at the HQ level.

In the Stage 2, the WMT training system, which is developed in Stage 1, is expected to be put into operation by the Iraqi side. And a result that five-day training courses were held eight times in total on the Iraqi side's initiative without the intervention of the Japanese experts is achieved in fact. Although all of these training courses were conducted by the MoWR, collaboration with the MoA was sought during actual implementation, and then it is achieved that approximately 30% of participants were from the MoA and/or DoA. In addition, collaboration in day-to-day extension activities has increased, such as visits to WUA sites by DoA staff riding in vehicles owned by DoWR.

In Iraq, the vertical division of administration is very much prominent, and it is customary for each ministry to handle all budgets and activities separately, so the fact that such concrete collaboration was achieved is a noteworthy achievement that serves as a good example of breaking down the vertical divisions between ministries.

Lesson For the works related to two ministries, it might be possible to foster the trusting relationship between those two ministries, and practical matters are improved by operating a system in which both ministries cooperate and proceed with proceedings and through setting up of regular joint meetings of both ministries at the HQ office level and the governorate office level. In the Iraqi case, however, although approximately 30% of the participants from the MoA participated in the trainings conducted by the MoWR, the MoWR did not provide daily allowances or transportation expenses. In other words, activity-level collaboration was strengthened, but budget-level collaboration was not realized. In this regard, the MoA needs to secure its own budget, and the project team needs to request the MoA to secure a budget by making courtesy calls to the Director General of the MoA in charge of finance and other higher officials. Such lessons can be applied to the other technical cooperation project in which multiple ministries and agencies serve as implementing agencies.

(4) Promotion of public relations

Challenge WUA system has officially started in Iraq after the enactment of the WUA Instructions in 2014, so its history is still short. Therefore, there was a need to widely publicize the significance and role of WUA to the general public.

Measure During Stage 1, a short (5 - 10 minutes) WUA PR movie has been prepared. This movie was prepared by a local Iraqi company under the supervision of the Japanese Experts Team who have prepared not only the outline of the video, but also the scene settings, script, and so on. The videos prepared in this way were actively used during various discussions, seminars, and ministerial visits during the Stage 2, and were also made available on the Facebook page of the Embassy of Japan in Iraq with their kind permission, which received favorable reviews.

Lesson PR video that explains the background, social significance, and effects of the project's activities in about 5 to 10 minutes is extremely useful for public relations activities. However, rather than just conveying the gist of the video and asking a company to prepare it, it is more effective for the expert team to consider and plan the video's structure, scene settings, script, and so on. This lesson is likely to be applicable to the other technical cooperation project with a view to dissemination, and projects that want to publicize the social significance.

(5) Utilizing opportunities to meet with policy makers to realize the policies

Challenge In order to strengthening participatory water management (WUA) system, it is important to improve policy aspects in addition to the on-site activities, and the challenge was how to achieve policy improvements.

Measure Although each mission period was limited to approximately two weeks, courtesy calls to policy makers were actively paid and discussion on WUA policies were made. The table below shows the proposals that achieved a certain degree of results and the proposals that did not achieve a certain degree of impact, as policy input using courtesy calls to policy makers.

Item	Content
Proposals that achieved certain results	- the WUA Instructions: Approval has been obtained within the Ministry of Water Resources, and the revision of the instruction has been sent to the State Council, which is an independent body, from the Ministry of Water Resources. Two rounds of consultations have been held between the State Council and the Legal Department of the Ministry of Water Resources. The revised WUA instructions is expected to be published in the official gazette within 2024. - National Development Plan: Regarding the national development plan, which is revised approximately every five years, the Ministry of Water Resources has submitted a draft to the Ministry of Planning that clearly states the promotion of WUAs.
Proposals that did not produce results	- Subsidies for laser levelers: Policymakers responded positively, and coordination was carried out among practitioners, but the subsidies were not granted. As a result of coordination among practitioners, it was concluded that subsidies could not be

	materialized unless number of farmers who show the willingness to procure Laser Leveler become a certain level. - WUA sections in the Directorate of Agriculture: Establishing new WUA sections in governorates where it is not yet existing was not achieved. - WUA Department in the State Commission of Operation Irrigation and Drainage Projects, Ministry of Water Resources: No increase in staff was achieved.

Lesson When it is necessary to propose policy recommendations through the results of on-the-ground activities in technical cooperation project, courtesy calls to policy makers such as ministers and DGs should be actively paid to discuss policy. In doing so, policy makers are often busy and have limited time for consultations, so it is important to convey the background and issues concisely and to propose concrete requests. Considering the self-reflection in Stage 2, it seems effective to organize and propose ideas so that they fit into about 4 slides or 1 paper document. Such lessons may be applicable to the other technical cooperation projects and advisory services where policy recommendations are required.

Chapter 4 Achievement of the Project Purpose

4.1 Achievement of Expected Outputs

For the Stage 2, two-expected outputs are set to be achieved. The prospects for achieving them are shown in the table below.

Table 4.1 Status of Achievement of Expected Outputs

<table>
<tr><th>Output</th><th>Indicator</th><th>Status of achievement</th></tr>
<tr><td>Output 1: PIDP is conducted at each site.</td><td>PIDPs are conducted at 18 sites.</td><td>[Achieved]
Number of the WUAs which have conducted the PIDP activities is as follows
<table>
<tr><th>Cropping Season</th><th>No. of WUAs which have conducted the PIDP activities</th></tr>
<tr><td>Winter 2020-21</td><td>15</td></tr>
<tr><td>Winter 2021-22</td><td>11</td></tr>
<tr><td>Winter 2022-23</td><td>10</td></tr>
<tr><td>Winter 2023-24</td><td>19</td></tr>
</table>
The main reason for not achieving the target of 18 sites currently was the severe water shortage (agricultural plan is 0%) by the 2022-23 winter cropping season. Therefore, following actions were taken for 2023-24 winter cropping season, namely, 1) For the WMTs that support the site facing difficulties in water share, if there is a WUA that water is available within their governorate, change the site; 2) For the WMTs that have successfully achieved the revision and implementation of the PIDP for the winter cropping season of 2022-23 in their governorate, select a second dissemination site to formulate and implement the PIDP.</td></tr>
<tr><td>Output 2: The WUA Policy paper prepared in the Stage 1 is implemented.</td><td>The proposed four policies indicated in the policy paper are realized.</td><td>[Expected to be achieved (Not achieved during Stage 2)]
Out of the four policies proposed in the policy paper, three were included in the draft revised WUA instructions: 1) promotion of WUAs with layered structures (large-scale WUA), 2) making WUAs a prerequisite for facility improvement, and 3) introduction of a compulsory membership system.
The amendment was approved on August 4, 2023 by the Opinion commission of the MoWR (a meeting body composed of the Minister of Water Resources and the heads of all departments of the Ministry). It was then sent to the external State Council, which has independence from the MoWR, on September 19, and two rounds of consultation between the State Council and the Legal Department of the MoWR have been conducted by the end of November. The proposed amendments are expected to be promulgated in the fall of 2024.
Note that the WUA Instructions is positioned as a subordinate legal form of the Irrigation and drainage networks maintenance law (The Law No. 12) and does not require parliamentary approval. The proposed policy will be realized and institutionalized when the amendment is completed.

Regarding a policy that is not included in the revision of WUA instructions, i.e., strengthening the organizational</td></tr>
</table>

Output	Indicator	Status of achievement
		structure at the governorate and sub-governorate levels to promote the WUA system, the following progress has been made in Stage 2. MoWR: One WUA officer was assigned to each sub-governorate office (i.e., reginal section office) by ministerial order (concurrent with other duties). MoA: "Section for On-Farm Water Management and WUA" were established in 10 DoA offices among 15 DoAs at the end of Stage 1. Subsequently, a letter from the MoA was issued and a section was established in Kakbala during Stage 2. However, two of the remaining four governorates (Diyala and DhiQar) had already established units that were not yet sections, while the remaining two governorates (Muthanna and Diwaniya) had neither sections nor units. The main reason for this is that, unlike the MoWR, the MoA is decentralized, so it is not possible for the MoA to issue "instructions" to the DoA to establish sections, but only "recommendations" for establishment. Subsequently, in the case of Diyala governorate, an application for the establishment of a section has already been submitted to the local government by the DG of the DoA through follow-up by the MoA, and similarly, in the case of the other three governorates, the MoA is following up the DoAs to submit an application for the establishment of a section to the local government.

4.2 Achievement of Project Purpose

The prospect for achieving the Project Purpose is shown in the table below:

Table 4.2 Status of Achievement of Project Purpose

Project Purpose	indicator	status of achievement
Project Purpose: The expansion system of the sustainable water management model through WUAs is strengthened.	(1) WUA and WMT training systems are implemented. (2) WUA monitoring forms are submitted by each governorate to the WUA Department of MoWR.	[Achieved] WUA Training System: WMTs have provided WUA training to WUAs as appropriate during the process of PIDP formulation, implementation, and revision at the model expansion sites. WMT Training System: In the first year of Stage 2, four WMT training courses were conducted by MoWR. In the second year of Stage 2, another four WMT training courses were conducted by MoWR. Each training batch lasted for 5 days, and about 20 people participated in each session (165 people in total). MoA/DoA officials also participated in the trainings at the MoWR (44 of the 165 participants belonged to the MoA/DoA). This is a good example of collaboration between the two ministries. WUA Monitoring Forms: 15 monitoring forms were submitted to the WUA Department of MoWR from each governorate in the first year of Stage 2. In the second year as well, 16 monitoring forms were submitted from each governorate to the WUA Department of MoWR.

4.3 Prospects for Achievement of Overall Goal

The table below shows the achievement of the overall goal of the project.

Table 4.3 Prospects of Achievement of Overall Goal

<table>
<tr><th>Overall Goal</th><th>Indicator</th><th>status of achievement</th></tr>
<tr><td>Overall Goal:
Sustainable water management areas operated by WUAs are expanded to the whole country.</td><td>(1) Participatory irrigation development plans are prepared, implemented, reviewed and revised by WUAs at more than 18 sites.</td><td>[Expected to be achieved]
A series of processes to formulate, implement, review, and revise the PIDP has been conducted as described in the following table.

<table><tr><th>Cropping Season</th><th>No. of WUAs which conducted the PIDP activities</th></tr><tr><td>Winter 2020-21</td><td>15 (Formulation&Implementation)</td></tr><tr><td>Winter 2021-22</td><td>11 (Revsion&Implementation)</td></tr><tr><td>Winter 2022-23</td><td>10 (Revsion&Implementation)</td></tr><tr><td>Winter 2023-24</td><td>19 (Revsion&Under implementation)</td></tr></table>In addition, beyond the overall goal indicator, the CPs of the MoWR and MoA and the WMTs of each governorate discussed the policy to expand sustainable water management by WUAs to all irrigated areas in Iraq. As a result, it was confirmed that the policy is to shift from the establishment of WUAs targeting canals at the terminal level (and formulation, implementation, and revision of PIDPs) to the establishment of large-scale WUAs targeting higher-level canals (and formulation, implementation, and revision of PIDPs).
Toward the realization of this policy, a revision of the WUA Instructions, which specifies the promotion of WUAs with a federated structure (large-scale WUAs), is in progress.</td></tr>
</table>

Chapter 5 Recommendations for Future Cooperation (Recommendations for the Next Project)

5.1 Overview of the Irrigation and Agriculture Sector in Iraq

5.1.1 Overview of the Irrigation and Agriculture Sector

(1) **Irrigation and agriculture sector policies**

The Strategy for Water and Land Resources in Iraq (SWLRI), prepared in 2014 primarily by the Ministry of Water Resources, the Government of Iraq, is the highest-level policy document for the water and land resources, mainly for the irrigation sector in Iraq (but it is not publicly available as it is an internal document only for the ministries). This document regards the declining of available water resources as a national issue and calls for a comprehensive response in both hardware aspects, such as improving/rehabilitating irrigation facilities and promoting water-saving irrigation methods, and in software aspects, such as institutional reform through water users' associations.

The Iraqi Ministry of Planning has formulated the National Development Plan 2018-2022 , which lists the following challenges for the agriculture sector: 1) Decline of agricultural production efficiency, productivity and agricultural products, which caused a deficit in meeting the demand for food and food security requirements; 2) Poor investment environment, limited private capital investments, and poor allocations and funding in the agricultural sector; and 3) Destruction of many infrastructures in agricultural sector, especially in the provinces affected by terrorism; and so on. It also lists the following challenges for the water resources sector: 1) Decline in water flows as well as Climate and Geological changes; 2) High waste ratio in irrigation water because of on-farm losses, as well as low irrigation and transport efficiency as a result of using old and traditional methods in water management; 3) Weak institutional and legislative system that became unable to address the serious water resources challenges; and 4) Increase of groundwater extraction; and so on. In light of these challenges in the agriculture and water resources sector, the following four development goals for the agriculture and water resources sector are set in the plan: 1) Increase the GDP contribution of the agricultural sector; 2) Achieve sustainable food security; 3) Secure the annual demand for sustainable water uses and achieve water balance with the possibility to reduce annual demand; and 4) Provide sustainable water resources. The means of achieving these goals include: 1) Manufacture machinery and agricultural equipment as well as establish a factory for agricultural supplies such as supplies of modern irrigation; 2) Develop the infrastructure of agricultural sector; 3) continuing agricultural improvement and extension, 4) proper management of water resources and improving irrigation efficiency, and 5) concluding treaties with upstream countries regarding water allocation.

(2) **Current Status of the Irrigation and Agriculture Sector**

1) Overview of the irrigation and agriculture sector

In the Republic of Iraq (hereinafter referred to as "Iraq"), irrigated agriculture is being practiced as the most of area, except for some areas in the north, has the annual rainfall below 500 mm, which is considered as the line at which rain-fed agriculture can be practiced. In addition, Iraq's agricultural sector accounts for 9% of the working population in 2021 (World Bank) and is a major source of employment in rural areas where employment opportunities other than agriculture are scarce. However, the agricultural

sector's contribution to GDP has been declining year by year from 8.4% in 2003 to 3.3% in 2021 (World Bank).

As the SWLRI and the National Development Plan are pointing out, the decline in available water resources is a major issue for the irrigation and agriculture sectors in Iraq. Approximately 90% of the country's water resources, on which the irrigated agriculture of Iraq relies, is taken from the Tigris and Euphrates Rivers, both of which are international rivers and run through the center of the country (Water and Agriculture Situation of Iraq, 2015). The proportion of surface water used by sectors is as follows. Water for agriculture accounts for 64% of the total, and the impact of agricultural water on the other water uses is enormous.

Table 5.1 Fresh Surface Water Consumption

	Water usage patterns	ratio
1)	Municipal & Industrial	8%
2)	Agiriculture	64%
3)	Fish Farms and Livestock	1%
4)	Total Marshlands Consumption	8%
5)	Flow to the Gulf via the Shatt al Arab River	5%
6)	Evaporation from Rivers	1%
7)	Evaporation from reservoirs	13%
	Total	100%

Source: Project Team (calculated from the data [BQM/Year] shown in the SWLRI)

2) Declining water resources

According to the SWLRI, it is expected that the annual amount of water resources available in Iraq will decrease significantly by 2035, and the country's National Development Plan 2018-2022 similarly predicts that the amount of water resources available in Iraq will decrease significantly from 43.7 billion tons in 2015 to 28.5 billion tons in 2035 (decrease of approximately 35%). In fact, as this prediction is confirmed, in many regions, only 50% of the usual area is allowed to cultivate in 2021-2022 winter cropping season, and in the following 2022-2023 winter cropping season, it was 25 % (later increased to 50%).

In this regard, according to the Central Statistical Organization of Iraq, the annual inflow into the Tigris and Euphrates rivers in recent years is as shown in the table below. The annual inflow (the average from 2015 to 2020) was 43.8 billion tons, and this value is as same as the one for the year of 2015 stated in the National Development Plan 2018-2022, which was 43.7 billion tons.

Table 5.2 Annual Inflow into the Tigris and Euphrates rivers (2015-2020) (Unit: Billion m^3)

		2015 yearly inflow	2016 yearly inflow	2017 yearly inflow	2018 yearly inflow	2019 yearly inflow	2020 yearly inflow	Average (2015-2020)
Tigris river*		15.0	15.4	13.8	8.9	31.3	11.4	**13.7**
Tributaries of Tigris	Upper Zab river**	7.1	10.6	7.3	6.9	20.7	10.2	**9.0**
	Little Zab river	3.0	6.8	3.1	3.4	11.6	4.3	**4.6**
	Great Zab river***	0.6	1.2	0.8	0.8	2.1	0.9	**0.9**
	Diyala river	1.8	5.8	2.4	3.3	10.9	2.5	**3.8**
Total inflow of the Tigris and its tributaries		27.5	39.6	27.4	23.4	76.5	29.4	**32.0**
Euphrates river ****		7.5	15.2	13.2	9.6	17.0	20.2	**11.8**
Total inflow of the Tigris and Euphrates rivers		35.0	54.8	40.5	33.0	93.5	49.6	**43.8**

*Yearly inflow of the Tigris River represents the amount of water coming into Iraq at the Turkish border.

**The upper Zab River inflow is estimated because there are not enough actual funds for disposal.
***Yearly inflow of the Great Zab River comes only from inside Iraq, and the rest comes from the source at the mouth of the Tigris.
****Yearly inflow of the Euphrates River represents the average since operating the Turkish-Syrian dam system since 1994.
Source: Central Statistical Organization (CSO), Ministry of Planning, Government of Iraq (GoI)

On the other hand, the historical average annual inflows of the Tigris and Euphrates rivers are as follows, and a clear downward trend can be seen for the average values from 2015 to 2020 when comparing.

Table 5.3 Annual inflows of the Tigris and Euphrates rivers (1933-2020) (unit: billion m^3)

River Name	Average annual inflow
Tigris and its tributaries (Upper Zab, Little Zab, Great Zab and Diyala)	Average of 1933-1998: 49.2 billion m^3 Average of 1999-2014: 32.6 billion m^3 Average of 2015-2020: 32.0 billion m^3
Euphrates	Average of 1933-1972: 30.3 billion m^3 Average of 1973-1989: 23.6 billion m^3 Average of 1990-2014: 16.9 billion m^3 Average of 2015-2020: 11.8 billion m^3

Source: SWLRI and Central Statistical Organization (CSO), GoI

3) Self-sufficiency trends and unit yields of major agricultural crops and wheat

Major agricultural products targeted production goals in the National Development Plan 2018-2022 are the following seven crops: wheat, barley, rice, maize, potatoes, tomatoes, onions, and dates. The annual yields of these major crops are shown in the table below. The reason for the decline in production from 2015 to 2018 might be not only the effects of changes in rainfall and river water levels, but also the rise of the Islamic State in Iraq (ISIL). By April 2014, the Islamic State (ISIL) had taken control of large areas of Anbar governorate, and since June of the same year, it has occupied major cities in the north, including Mosul, the capital of Ninawa governorate. ISIL reached its peak in 2015, but by the end of 2017 the Iraqi government had retaken all ISIL -held territory.

Table 5.4 Production volume of major agricultural crops (unit: thousand tons)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Wheat	4178	5055	2645	3053	2974	2178	4343	6238	4234	2765	4248
Barley	1003	1277	330	499	303	191	1518	1756	267	145	106
Rice	-	-	109	-	-	-	-	-	-	-	-
Maize	831	289	182	260	185	63	473	419	374	496	-
Potato	647	402	162	191	267	166	392	675	466	271	-
Tomato	904	771	388	287	305	468	620	755	744	630	-
Onion	-	-	21	14	13	13	29	66	74	75	-
Dates	-	-	602	615	619	646	639	735	-	-	-

Source: Central Statistical Organization (CSO), GoI

In case of the most produced wheat, its import volume is shown in the table below. Iraq imports as much as it produces every year, and thus it can be said that improvements are needed from the perspective of food security.

Table 5.5 Wheat import volume (unit: 1,000 tons)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Import amount	-	-	2218	2300	4108	3915	2500	2600	2576	3500	2218

Source: United States Department of Agriculture (USDA)

The unit yield of wheat is as follows. There is no improvement in productivity compared to 10 years ago.

Table 5.6 Wheat yield (unit: ton / ha)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Unit Yield	2.3	2.4	2.6	3.3	2.8	2.8	2.7	2.9	1.8	1.5	2.0

Source: Central Statistical Organization (CSO), GoI

(3) Government agencies in the irrigation and agriculture sector

The main government agencies in irrigation and agriculture sector of Iraq are the Ministry of Water Resources and the Ministry of Agriculture. The Ministry of Water Resources has jurisdiction over the matters outside the farms, and the Ministry of Agriculture has jurisdiction within the frams.

The organizational chart of the Ministry of Water Resources is shown in the figure below. The Ministry has 6 permanent state commissions overseeing management and maintenance of irrigation and drainage projects, groundwater use, etc.; 6 directorates for general planning and follow-up, administrative, financial and legal matters, and dredging and river drainage; 3 centers in charge of water resources management and facility design, etc.; and 3 state companies responsible for development of dams and implementation (construction) of irrigation projects. The WUA department is located in both the State Commission for Operation Irrigation & Drainage Projects and the Directorate of Planning & Follow up.

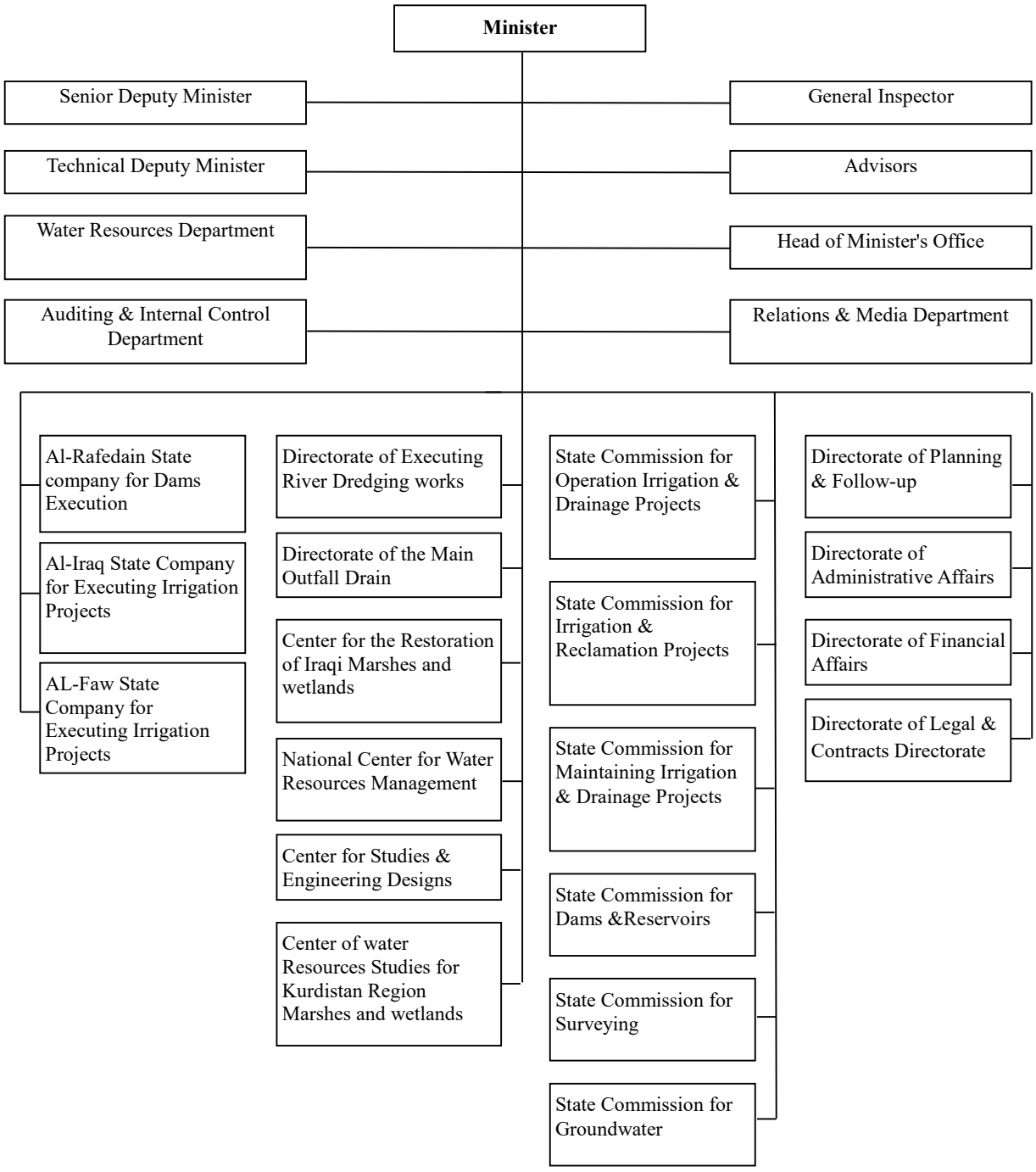


Figure 5.1 Organizational chart of the Ministry of Water Resources

Each governorate has its own Directorate of Water Resources, and the structure of the one in Dhi-Qar Governorate is shown in the diagram below as an example. There are sections for planning, design, implementation, accounting, legal affairs, and a section for WUAs. In addition, organizations called Units have jurisdiction over each district within the governorate, and each Unit has a local office.

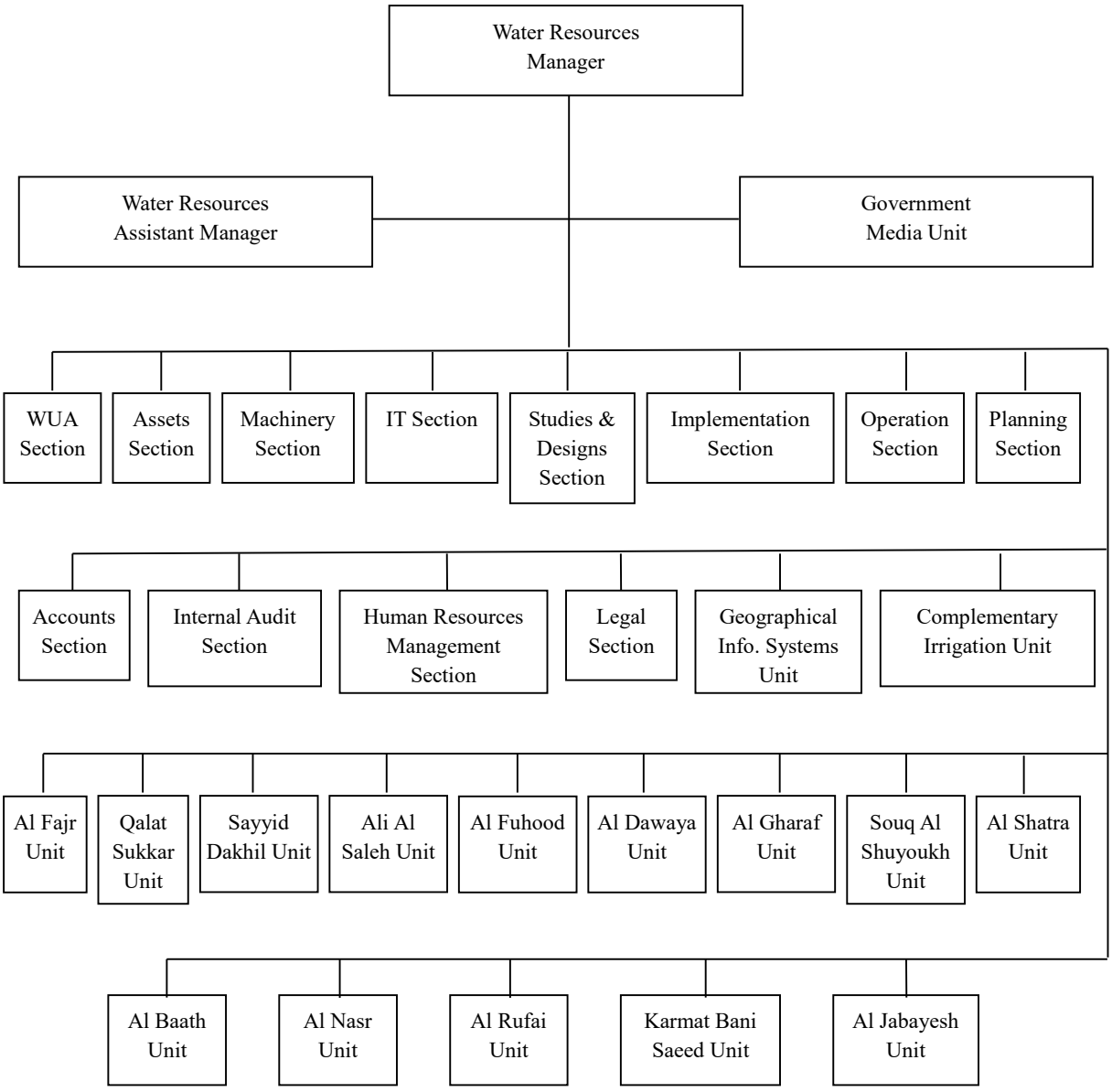


Figure 5.2 Organizational chart of the Water Resources Department

The organizational chart of the Ministry of Agriculture is as shown below. In the ministry 9 technical offices including those for agricultural research, agricultural extension, livestock, and seeds testing & certification, etc.; and 2 state companies responsible for overseeing irrigation technology and seed certification; and the Directorate of Agriculture (technical sector) is placed under the technical deputy minister. On the other hand, central departments for internal auditing and monitoring, finance, clerical, legal affairs, etc., and Directorate of Agriculture (administrative, financial, legal) come under the administrative deputy minister. It is to be noted that the water saving irrigation methods at field level is implemented by Planning & Follow-up Office, Agricultural Research Office, Agricultural Extension & Training Office, and Sanharib Company for Irrigation Technique. The On-farm Water management and WUA section is located in the Planning & Follow-up Office. It should be noted that the Directorate of Agriculture are under the jurisdiction of each local government (goverorate) due to decentralization, and are not subordinate to the central Ministry of Agriculture.

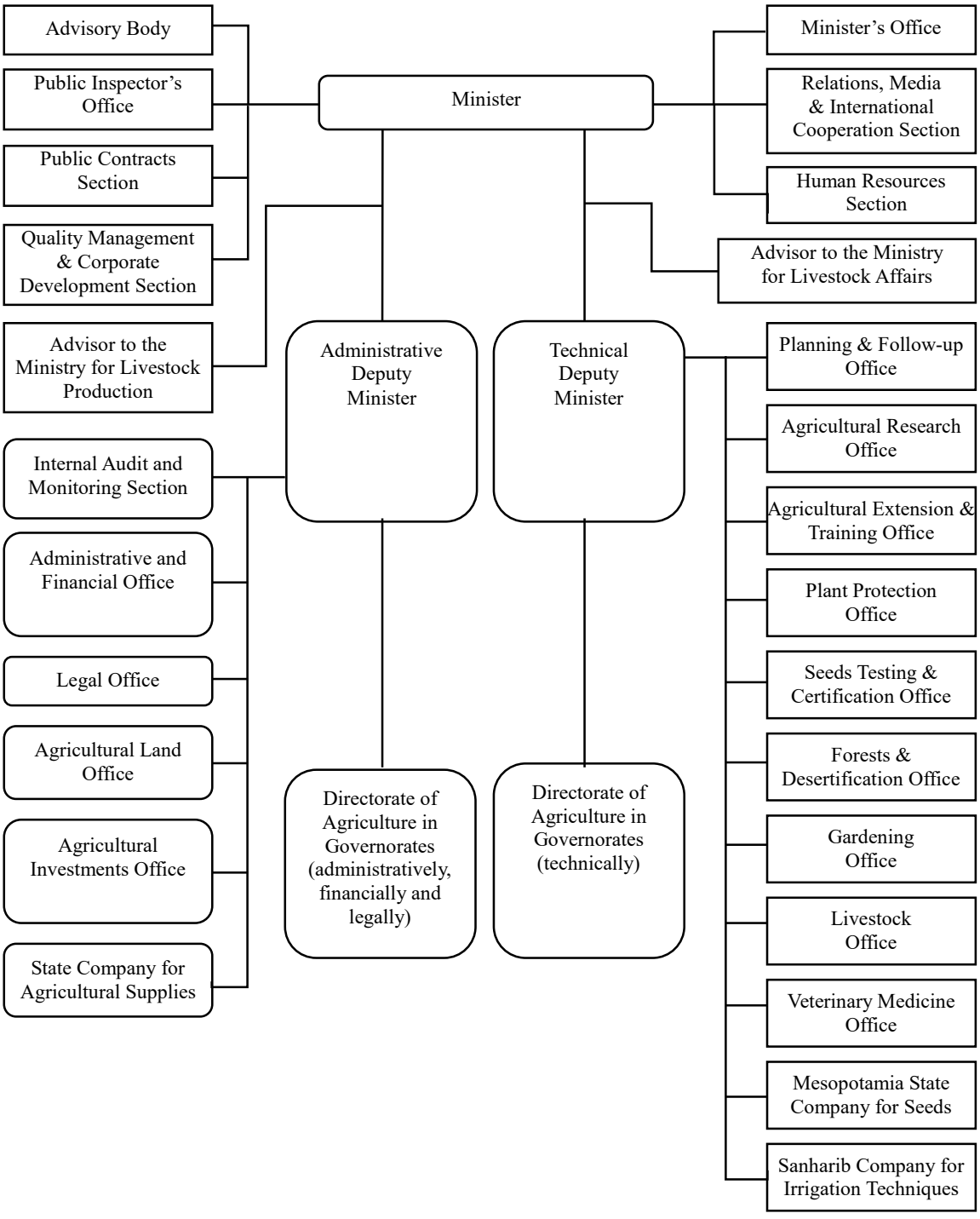


Figure 5.3 Organizational structure of the Ministry of Agriculture (Central and governorate)

(4) Trends of other donors in the irrigation and agriculture sector

It has been identified that no other donor agencies have the direct project aiming of strengthening the WUA system or irrigation management capacity. On the other hand, the following related projects are being carried out:

IFAD: The Smallholder Agricultural Revitalization Project (2017-2025) is currently being implemented in

four southern governorates (Misan, Muthanna, Diwaniyah, and Dhi-Qar). The project aims strengthening resilience of smallholders to climate change through increased crop productivity and crop diversification. This project includes the rehabilitation of irrigation facilities that supply water to a total of 8,322 hectares; improving nutrition through crop diversification; and developing and increasing dairy, fish, and poultry farms.

WFP: Rehabilitaion of weather stations installed by the Ministry of Agriculture of Iraq and developing wetlands at 11 sites in Dhi-Qar Governorate is being implemented as part of a program to strengthen resilience to climate change, in addition to providing farmers with seeds, fertilizer, sprinklers, solar power pumps, etc. Of these activities, particularly in the wetlands development, WFP is considering to use the sewage water for agriculture after treating by natural treatment structures and to establish a WUA for the water use and the maintenance of the facilities.

World Bank: Currently, there are no projects being implemented in the agriculture or irrigation sector.

5.1.2 Japanese Aid Policy and Achievements for the Irrigation and Agriculture Sector

(1) Japanese Assistance Policy

The priority areas of Country Assistance Policy of Japan for Iraq (2017) are: 1) Industrial promotion and diversification for economic growth, 2) Strengthening basic economic infrastructure, 3) Development of the living base, and 4) Support for strengthening governance. Regarding industrial promotion and diversification for economic growth, it states, "In order to achieve sound economic and social growth and industrial diversification that can withstand low oil prices in the long term, the support for the industrial promotion that promotes employment will be provided," and "In particular, since the agriculture and mining sectors are the main non-oil industries in Iraq, the support in areas such as rehabilitation of related infrastructure, improving productivity, and improving water resource management capabilities will be provided."

Furthermore, in "Agricultural and Rural Development (Sustainable Food Systems)" of JICA's Global Agenda, it is stated "achieve poverty reduction in rural areas through increasing farmers' incomes and revitalizing the rural economy." and "ensure food security through sustainable production and supply of food."

(2) Japan's assistance achievements

< ODA Loan >

①Irrigation Sector Loan (L/A signed in January 2008)

②Irrigation Sector Loan 2 (L/A signed in May 2018)

< Technical Cooperation >

①Project for Spreading Water Users Associations for the Efficient Use of Irrigation Water (2012-2015)

②Project for Sustainable Irrigation Water Management through Water Users Associations (Stage 1 (2017-2021) & Stage 2 (2022-2024))

Technical cooperation ① was mainly implemented as training in third countries, and was implemented without any on-site visits by Japanese experts from the perspective of security reason. Technical cooperation ② was the first one that become possible to curry out the activities within Iraq and strengthen

the actual activities of WUAs.

Based on the above-mentioned Japanese assistance and the results of Stage 2 of the Project, the outline of the next project proposed by the Iraqi CP and Japanese experts is as follows:

5.2 Project Outline

5.2.1 Project Background

According to the Strategy for Water and Land Resources in Iraq (SWLRI), which was prepared in 2014 mainly by the Ministry of Water Resources, GoI, it is expected that the annual amount of water resources available in Iraq will decrease significantly by 2035, and the country's National Development Plan 2018-2022 similarly predicts that the amount of water resources available in Iraq will decrease significantly from 43.7 billion tons in 2015 to 28.5 billion tons in 2035 (decrease of approximately 35%). In fact, as this prediction is confirmed, in many regions, only 50% of the usual area is allowed to cultivate in 2021-2022 winter cropping season, and in the following 2022-2023 winter cropping season, it was 25 % (later increased to 50%), and thus farmers are facing extremely serious water shortages, and there is no optimistic outlook for the future.

The main causes of this drastic decrease in available water resources are said to be development of huge irrigation project including large dams in the upstream countries of the Tigris and Euphrates, as well as the climate change. Old and degraded irrigation facilities and inappropriate maintenance and management is accelerating this.

As a result, Iraq faces low agricultural productivity, which may threat the food security of the country. It is one of the very serious national issues for the country. In fact, the National Development Plan 2018-2022 also sets food security and effective use of water resources as major development goals for the agriculture and water resources sector in light of the depletion of water resources.

As a response to this water crisis, the Iraqi government has been trying to conclude a treaty for water allocation with upstream countries. But there are no prospects for its realization, and it is also difficult to develop new water sources in the country. Therefore, effective use of limited water resources is a realistic solution.

Technically, the effective use of limited water resources consists of three elements: improvement of conveyance efficiency, application efficiency, and management efficiency (water distribution). Among the improvement measures, conveyance efficiency can be improved by improving irrigation facilities, such as converting from earthen canals to concrete-lined canals or pipelines, however, this requires proper maintenance with the participation of actual water users groups. Similarly, improvement of water distribution cannot be realized without the participation of the water users groups. Application efficiency can be improved by individual farmers adopting water-saving irrigation methods, but water users groups can accelerate their dissemination.

This is why Water Users Associations (WUAs), which are groups of water users, are essential for the effective use of water resources, and the government needs to make a serious effort to tackle them as an

important means of resolving water crises. This effort will foster strengthening of resilience against the climate change, as it helps how to share and deal with scarce water under the water shortage situation.

For such background, JICA has been promoting the development of the WUA system in cooperation with the Iraqi side, despite security and other constraints. Specifically, "Project for Spreading Water Users Associations for the Efficient Use of Irrigation Water" (April 2012 to March 2015) with the aim of establishing WUA and disseminating water-saving irrigation by the Iraqi side. In April 2014, Iraq's first WUA Law (WUA Instructions) was enacted and the establishment of the WUA fomally began. In the "Project for Sustainable Irrigation Water Management through Water Users Associations " (Stage 1: April 2017 to February 2021, Stage 2: July 2022 to May 2024), with support from Directorate of Water Resources and Directorate of Agriculture in governorates, a sustainable water management model by WUAs was developed, in which each WUA formulates, implements, and revise every year a participatory irrigation development plan (PIDP). For the winter cropping season 2023-24, PIDP was formulated and implemented in 19 sites nationwide. As a result, 1) irrigation facilities are inspected and maintained based on OMM subscription contributed by farmers themselves; 2) fair water distribution rules determined by farmers themselves are implemented, which can cover the disadvantages of downstream areas; and 3) Irrigation scheduling, in which irrigation water is applied in the fields at the right time and in the right amount, as well as water-saving irrigation methods became widespread.

Quantitatively, the laser leveling technology, which simultaneously achieved 35 % water savings and 43 % yield increase at the model site, has been spread over a total of 2,658 ha (total of 246 farmers) by the eleven laser land levelers in and near the model dissemination areas nationwide, out of which the three units was provided by JICA and eight was purchased by farmers, who recognize the benefit of LLL. In addition, 87% of collection rate of OMM subscription was achieved in model extension sites nationwide, and inspections and maintenance based on this were implemented at 16 sites, and fair water distribution rules were implemented at 14 sites.

However, the above-mentioned sustainable water management model by WUAs was developed mainly by targeting WUAs established at the terminal level for the watercourses, so if the current pace of establishment of WUAs and the expansion of the model continue, it will take approximately 100 years for WUAs to cover the entire irrigated area in Iraq (with 10 years, current coverage rate is about 10% of the total irrigated area). In addition, promoting the establishment of WUAs at the terminal level may not be able to involve upstream areas, and thus it becomes difficult to coordinate water distribution between upstream and downstream areas at higher level such as main canal, secondary canal, and distributary canal.

It is, therefore, necessary to focus on higher-level canals and promote the establishment of the WUAs in the large-scale irrigated areas covering the area of main and secondary canals, distributary, and watercourse, while applying the "advanced water management model" at the higher level. In fact, in Iraq, there are 142 large-scale irrigation projects (IPs) are defined in the SWLRI, and these IPs can be targeted to establish the WUAs.

In this way, when a WUA manage large-scale irrigation area, amount of collected OMM subscription may become much bigger, so out-sourcing to the private service providers or placing orders to private sector companies may increase. In other words, activities by WUAs in the large-scale irrigated areas have the

aspect of promoting private sector development. In oil-dependent Iraq, private sector development is one of the major national issues, and especially that in the agricultural sector is regarded as a promising area. In fact, the National Development Plan 2018-2022 also sets specific targets for improving the contribution of the private sector and developing SMEs. Therefore, it will contribute to the development of Iraq's agricultural sector by including not only WUAs but also private sector growing in parallel with them.

Based on this background, the "Project for Strengthening Climate-Change Resilience through WUA in Large-Scale Irrigation Areas" (hereinafter referred to as "the Project") is proposed. The purpose of the Project are: 1) Sustainable irrigation water management models developed in previous projects will also function in a WUA at large-scale irrigation areas, so the model will be improved through on-site activities and the new model be spreaded; 2) for the operation and maintenance of facilities in large-scale irrigation areas and water management in the same area, as it is expected to increase the number of contracts between various service providers and WUA, private sector development related to agriculture is also be supported; and at the same time, 3) establishing and disseminating a sustainable water management model in a large-scale irrigation area by establishing a dissemination system for improved sustainable water management models in 15 governorates.

After the project, the Iraqi government is expected to expand (horizontally) the sustainable water management model in the large-scale irrigation areas throughout Iraq. Hereinafter, the framework for the proposed Project is described, but it is added to say that both of the Iraqi side and JICA side will need to discuss it again, when the project plan is formulated.

5.2.2 Project Framework

(1) Purpose of the Project

Targeting mainly the government officials of the WUA-related departments of MoWR and MoA at HQ level as well as DoWR and DoA at Governorate level, the purpose of the Project is: 1) to develop the sustainable water management model for the large-scale irrigation area based on the model developed in the previous projects; 2) to promote maintaining and improving the irrigation facilities' functions, strengthening the management capacity of WUA, and cooperating with related industries, through using various private service providers regarding the maintenance and water management implemented by WUA; 3) to attempt introduction and settlement of the developed sustainable water management model for the large-scale irrigation area all over the country by strengthening the dissemination system of the model.

(2) Project site/target area

Target area:

- Irrigation areas in 15 governorates in Iraq except for northern 3 governorates (Erbil, As-Sulaumaniyah and Duhok)
- Model site: 2, 3 model sites are expected to be set from irrigation areas in 15 governorates (including areas that can be visited by Japanese experts)

(3) Beneficiaries of this project (target group)

Direct beneficiaries:

- About 10 government officials from WUA related departments of MoWR and MoA
- Approximately 150 WUA related department officials from DoWR and DoA in 15 governorates

Ultimate beneficiary:

- WUA members (farmers) of the model sites supported by WUA-related department officials from each governorate's DoWR and DoA in 15 governorates

(4) Total project cost (Japanese side)

- xxx JPY

(5) Project implementation period

Assuming from October 2024 to September 2029 (total 60 months)

(6) Project implementation structure

- Responsible agency: Ministry of Water Resources (MoWR)
- Implementing agencies: Ministry of Water Resources (MoWR) and Ministry of Agriculture (MoA), Directorate of Water Resources (DoWRs) and Directorate of Agriculture (DoAs) in 15 governorates
- Cooperating agencies: Prime Minister's Advisory Commission (PMAC) and Ministry of Planning (MoP)

(7) Input

<Japanese side>

1) Dispatch of experts:

- Team Leader/WUA Policy
- Participatory Irrigation Management
- On-Farm Water Management
- Private Sector Development
- Contracts, Accounting, and Auditing
- Training Planning/Coordination

2) Acceptance of trainees:

- Third country training (in the field of Irrigation Management; approximately 10 participants)

3) Provision of equipment: Equipment necessary for project implementation

- Technical equipment and office supplies

<Iraqi side>

1) Assignment of C/P (counterparts)

Assign counterparts including Project Director and Project Manager from the implementing agencies listed in (6) above

Assign JCC members from the cooperating agancies listed in (6), though counterparts who directly implement the project will not be assigned from them

2) Expenses of Iraqi side for conducting the project activities (domestic traveling expenses, accommodation expenses, daily allowances, and conference/training expenses), office room for the project and the other operational expenses

(8) Overall Goal

The sustainable water management model in large-scale irrigation areas will be expanded to target districts throughout Iraq.

Indicators and targets:

In more than X number of large-scale irrigation areas, WUAs are established and the cycle of the PIDP i.e., formulating, implementing, and revising, is implemented.

(9) Project goal

The Sustainable Water Management Model in large-scale irrigation areas is established and disseminated.

Indicators and target values:

1) X% or more of the relevant government officials and farmer representatives at the model site evaluate the effectiveness of participatory irrigation development plan in improving water management.
2) Guidelines for the establishment and operation of WUAs for large-scale irrigation areas are approved by the Ministry of Water Resources and the Ministry of Agriculture.

(10) Outputs

Output1: Advanced Sustainable Water Management Model that can be applied for the large-scale irrigation area is developed based on the model developed in previous project.

Indicator1: Participatory Irrigation Development Plans are formlated, implementated, and revised at the model sites targeting large-scale irrigation areas.

Output2: Maintenance and water management activities by WUA are promoted using various private service providers.

Indicator2: The number of contracts between WUAs and private service providers in the model sites increases by X%.

Output3: A system for disseminating the advanced sustainable water management model in large-scale irrigation areas is established.

Indicator3.1: X% of WUA related government officials in 15 governorates pass the achievement test.

Indicator3.2: All staff of the WUA Department of the Ministry of Water Resources pass the achievement test.

Indicator3.3: Registeration record of farming land, irrigation facilities and assets, maintenance/operation plan are prepared for supporting WUAs.

(11) Activities

1.1: Sustainable water management system review committee is established.

1.2: Model sites are selected among large-scale irrigation areas

1.3: The current status of the model site (farmers, farming, irrigation facilities (spec), assets, usage/management, etc.) is understood.

1.4: Draft guideline for establishment, operation, and management of WUA in large-scale irrigation areas is prepared.

1.5: In the model sites, a WUA manager is appointed by ministrial order and a Preparatory Committee is established to prepare for establishment of the WUA and to function as a secretariat (operational office).

1.6: In accordance with the Draft Guidelines, the Preparatory Committee prepare a proposal for the division of the model site and obtain approval from the Review Committee.

1.7: Based on the proposed division of the model site, organize the groups and elect representatives.

1.8: WUAs with a hierarchical structure are established in the model sites, and Board Members are elected. (If WUA has already been established, it will be modified into a hierarchical operating structure)

1.9: At the model site, the participatory irrigation development plan by the WUA is approved at the general meeting (general meeting by representatives) and implemented/revised.

1.10: Guidelines for the establishment, operation, and management of WUAs organized in large-scale irrigation areas are finalized.

2.1: Local private service providers are surveyed in large-scale irrigation areas, and service details and contact information are compiled into a list.

2.2: A business matching seminar is held at a model site between private service providers and WUA.

2.3: The WUA formulate a plan for placing order with private service providers, reflect it in the WUA's participatory irrigation project plan, and obtain approval.

2.4: The WUA places orders with private service providers and the works are implemented.

2.5: The feasibility of a subsidy system to promote the use of private service providers by the WUA is investigated and recommendations is prepared.

3.1: Plan for dissemination of the Sustainable Water Management Model, including seminars and trainings for related officials in 15 governorates, is prepared.

3.2: Seminar for model dissemination is conducted for related officials in 15 governorates.

3.3: Model dissemination meetings are held for related officials in 15 governorates.

3.4: Model dissemination trainings is conducted for related officials in 15 governorates.

3.5: Institutional set-up for supporting WUA at HQ level and at governorate level are strengthened.

3.6: Registeration record of farming land, irrigation facilities and assets, maintenance/operation plan are prepared for supporting WUAs.

3.7: Progress of the revision of the WUA instructions is monitored and support is provided for its enactment.

3.8: Seminars is held to promote understanding of the revised WUA instructions for the stakeholders.

3.9: Effectiveness of the revised WUA instruction is reviewed, and necessary measures including the revision is taken.

5.2.3 Points to be Noted for Implementing the Project

(1) Linkage with Irrigation Sector Loan 2

The Irrigation Sector Loan 2 is planned to be implemented and it consists of three components: 1)

construction of new irrigation and drainage facilities, 2) rehabilitation of irrigation facilities such as canals and pumping stations, and 3) construction of irrigation facilities at WUA sites.

Regarding the WUA component mentioned as 3) above, as the constructions are planned to be done in the relatively small WUA area, and thus it is already possible to provide a certain level of support by Iraqi side whose capacity has been strengthened through past technical cooperation. However, if this project runs in tandem, even more generous support will become possible. In addition, if the Project, which aims to develop a model for WUAs in large-scale irrigation areas, goes into functional, it will be possible to support the above-mentioned 1) component by establishing WUA in the areas targeted for the development of large-scale irrigation facilities. The Project can contribute to make the impact even greater. It is important to implement the Project with these points in mind.

(2) Security constraints and model site selection

For Japanese side, the places where on-site operations are permitted is restricted from the perspective of security management, and currently only four governorates are permitted to be visited: Baghdad, Basra, Dhi-Qar, and Muthanna. Though it would be preferable for Japanese experts to visit the model sites, there is a possibility that visits will not be possible due to the above-mentioned restrictions.

Therefore, one of the 2 or 3 model sites will be selected from an area where visits of Japanese experts are currently permitted, and then two types of the model sites will be set up: the one is visited by Japanese experts and the other one will be conducted without the visit of Japanese experts. At present, the five governorates of Misan, Kirkuk, Basra, Diwaniyah, and Babil are considered as candidate model sites, and among these, the WUA of Basra governorate is assumed to be the site that Japanese experts can visit.

(3) Dispute resolution over water

The Irrigation and Drainage Networks Maintenance Law (Law No. 12) states that one of the purposes of the WUA is to "contribute to the resolution of disputes among water users". However, the Law No. 12 and the current WUA Instructions, as well as the proposed amendments to the WUA Instructions, do not have specific provisions regarding the resolution of disputes over water. In this regard, it would be beneficial for the Iraqi Government to present a basic approach for resolution of disputes over water to farmers, and it is necessary to fully discuss with Iraqi officials on necessary measures, such as the development of guidelines.

5.3 Project Implementation Validity (Six-item Evaluation)

5.3.1 Evaluation Perspective

Ex-ante evaluation, which is used to verify the necessity of a project and set goals, checks the priority and necessity of the project before it is implemented from the perspective of the six DAC evaluation criteria (relevance, consistency, effectiveness, impact, efficiency, and sustainability), verifies the content of the cooperation and the expected effects of the cooperation, and sets indicators to measure the effects of the cooperation. The perspectives for evaluation based on the six DAC evaluation criteria are shown in the following table.

Table 5.7 Perspectives for evaluation based on DAC evaluation criteria

Criteria	Evaluation perspective
RELEVANCE	The extent to which the intervention objectives and design respond to beneficiaries', global, country, and partner/institution needs, policies, and priorities, and continue to do so if circumstances change.
COHERENCE	The compatibility of the intervention with other interventions in a country, sector or institution.
EFFECTIVENESS	The extent to which the intervention achieved, or is expected to achieve, its objectives, and its results, including any differential results across groups.
IMPACT	The extent to which the intervention has generated or is expected to generate significant positive or negative, intended or unintended, higher-level effects.
EFFICIENCY	The extent to which the intervention delivers, or is likely to deliver, results in an economic and timely way.
SUSTAINABILITY	The extent to which the net benefits of the intervention continue, or are likely to continue.

Source: "JICA Project Evaluation Handbook (Ver.2.0)" JICA Evaluation Department

5.3.2 Six-item Evaluaiton

(1) Relevance

1) Relevance with Iraqi policies

In the National Development Plan (2018-2022) of Iraq, food security and effective use of water resources are set as the main development goals for the agriculture and water resources sector in light of the declining water resources. The goal of the Project, i.e., development and dissemination of Sustainable Water Management Model in large-scale irrigated areas can be considered to have a great contribution to these main development goals of NDP.

Furthermore, according to the SWLRI , the annual amount of available water resources in Iraq is predicted to decrease significantly until 2035, and as a countermeasure, the government is set "Institutional reform" whose main topic is for strengthening WUA, in addition to focusing on improving irrigation efficiency. So it can be said that the goals of the Project are consistent with the direction that SWLRI is aiming for.

2) Relevance with Japanese country aid policy

The priority areas in Japanese Country Assistance Policy for Iraq (2017) are: 1) Industrial promotion and diversification for economic growth, 2) Strengthening basic economic infrastructure, 3) Development of the living base, and 4) Support for strengthening governance. Regarding industrial promotion and diversification for economic growth, it states, "In order to achieve sound economic and social growth and industrial diversification that can withstand low oil prices in the long term, the support for the industrial promotion that promotes employment will be provided," and "In particular, since the agriculture and mining sectors are the main non-oil industries in Iraq, the support in areas such as rehabilitation of related infrastructure, improving productivity, and improving water resource management capabilities will be provided." So, it can be said that the Project is in line with this policy.

Furthermore, this Project can be positioned as a cooperation that contributes to the goals mentioned in "Agricultural and Rural Development (Sustainable Food Systems)" of JICA's Global Agenda, which is "achieve poverty reduction in rural areas through increasing farmers' incomes and revitalizing the rural economy." and "ensure food security through sustainable production and supply of food." In the medium to long term, the Project will support the transition to the resilient agriculture that is not overly dependent on imports and can respond to risks.

3) Relevance with needs

"Project for Spreading Water Users Associations for the Efficient Use of Irrigation Water" (April 2012 to March 2015) with the aim of establishing WUA and disseminating water-saving irrigation by the Iraqi side. In April 2014, Iraq's first WUA Law (WUA Instructions) was enacted and the establishment of the WUA fomally began.

In the previous "Project for Sustainable Irrigation Water Management through Water Users Associations" (Stage 1: April 2017 to February 2021, Stage 2: July 2022 to May 2024), with support from Directorate of Water Resources and Directorate of Agriculture in governorates, a sustainable water management model by WUAs was developed, in which each WUA formulates, implements, and revises every year a participatory irrigation development plan (PIDP). For the winter cropping season 2023-24, PIDP was formulated and implemented in 19 sites nationwide. As a result, 1) irrigation facilities are inspected and maintained based on the OMM subscription contributed by farmers themselves; 2) fair water distribution rules determined by farmers themselves are implemented, which can cover the disadvantages of downstream areas; and 3) Irrigation scheduling, in which irrigation water is applied in the fields at the right time and in the right amount, as well as water-saving irrigation methods became widespread. Quantitatively, the laser leveling technology, which simultaneously achieved 35% water savings and 43% yield increase at the model site, has been spread over a total of 2,658 ha (total of 246 farmers) by the eleven laser land levelers in and near the model dissemination areas nationwide, out of which the three units was provided by JICA and eight was purchased by farmers, who recognize the benefit of LLL. In addition, 87% of collection rate of OMM subscription was achieved in model extension sites nationwide, and inspections and maintenance based on this were implemented at 16 sites, and fair water distribution rules were implemented at 14 sites.

However, the above-mentioned sustainable water management model by WUAs was developed mainly by targeting WUAs established at the terminal level for the watercourses, so if the current pace of establishment of WUAs and the expansion of the model continue, it will take approximately 100 years for WUAs to cover the entire irrigated area in Iraq (with 10 years, current coverage rate is about 10% of the total irrigated area). In addition, promoting the establishment of WUAs at the terminal level may not be able to involve upstream areas, and thus it becomes difficult to coordinate water distribution between upstream and downstream areas at higher level such as main canal, secondary canal, and distributary canal.

It is, therefore, necessary to focus on higher-level canals and promote the establishment of the WUA in the large-scale irrigated areas covering the area of main and secondary canals, distributary, and watercourse, while applying the "advanced water management model" at the higher level. In fact, in Iraq, there are 142 large-scale irrigation projects (IPs) are defined in the SWLRI, and these IPs can be targeted to establish the WUAs.

As the Project aims to promote participatory irrigation management in large-scale irrigation areas while utilizing the results of previous projects, it can be said that the content of the cooperation is in line with the needs of the Iraqi side.

4) Utilization of Japanese technology and advantages

As mentioned above, since the implementation of participatory irrigation management was promoted at the field level in previous projects, sufficient implementation know-how has been accumulated, and there is an advantage in continuing to utilize Japanese technology. In particular, Japan is in a position to lead other donors for WUA system in Iraq, as it has been institutionalized in Iraq with Japanese assistance, and thus Japanese cooperation is highly advantageous.

5) Public interest nature of the project and suitability as ODA

This project aims to ensure cultivated area and improve productivity for farmers who are cultivating in the irrigated areas by strengthening the irrigation management capacity of the governmental officials of the Ministry of Water Resources (including the Directorate of Water Resources) and the Ministry of Agriculture (including the Directorate of Agriculture). Therefore, it can be judged that the effects to be acheived by the Project are of high public interest and are eligible for ODA.

(2) Coherence

1) Coherence with Japanese aid policy

The priority areas of Country Assistance Policy of Japan for Iraq (2017) are: 1) Industrial promotion and diversification for economic growth, 2) Strengthening basic economic infrastructure, 3) Development of the living base, and 4) Support for strengthening governance. Regarding industrial promotion and diversification for economic growth, it states, "In order to achieve sound economic and social growth and industrial diversification that can withstand low oil prices in the long term, the support for the industrial promotion that promotes employment will be provided," and "In particular, since the agriculture and mining sectors are the main non-oil industries in Iraq, the support in areas such as rehabilitation of related infrastructure, improving productivity, and improving water resource management capabilities will be provided." It, therefore, can be said that the Project conforms to this policy.

In addition, the Project can be positioned as a cooperation that contributes to the goals mentioned in "Agricultural and Rural Development (Sustainable Food Systems)" of JICA's Global Agenda, which is "achieve poverty reduction in rural areas through increasing farmers' incomes and revitalizing the rural economy." and "ensure food security through sustainable production and supply of food." In the medium to long term, the Project will support the transition to the resilient agriculture that is not overly dependent on imports and can respond to risks.

As described above, the Project is highly consistent with Japanese aid policy.

2) International framework

As the Project will contribute to food security as stated in the National Development Plan (2018-2022) of Iraq, and therefore will contribute to the achievement of SDGs Goal 2 "Eradicate hunger, food security, improved nutrition and promote sustainable agriculture".

In addition, IFAD is currently implementing "The Smallholder Agricultural Revitalization Project (2017-2025)" in four southern governorates (Misan, Muthanna, Diwaniyah, and Dhi-Qar). This project aims strengthening resilience of smallholders to climate change through increased crop productivity and crop diversification. This project includes the rehabilitation of irrigation facilities that supply water to a total of 8,322 hectares; improving nutrition through crop diversification; and developing and increasing dairy, fish, and poultry farms. WFP is implementing rehabilitaion of weather stations installed by the Ministry of Agriculture of Iraq and developing wetlands at 11 sites in Dhi-Qar Governorate as part of a program to strengthen resilience to climate change, in addition to providing farmers with seeds, fertilizer, sprinklers, solar power pumps, etc. Out of these activities, particularly in the wetlands development, WFP is considering to use the sewage water for agriculture after treating by natural treatment structures and to establish a WUA for the water use and the maintenance of the facilities. These IFAD and WFP projects aim to strengthen the resilience of the agricultural sector against climate change, and these are consistent with the aims of the Project and are expected to produce synergistic effects.

As mentioned above, the Project is highly consistent with international frameworks.

(3) Effectiveness

1) Causal relationship with a project goal and outputs

The project aims to establish and disseminate the sustainable water management models in large-scale irrigated areas, and to achieve this goal, three outputs were set: "A sustainable water management model applicable to large irrigated areas is developed based on the sustainable water management model developed in the previous project (Output 1)", "Maintenance and water management activities by WUAs using various private service providers are promoted (Output 2)", and "A dissemination system for sustainable water management models in large irrigated areas is established (Output 3)". The project design seeks to achieve the project goal by developing the model (Output 1), promoting the use of private service providers (Output 2), and establishing a dissemination system for the model (Output 3). By achieving these outputs, it is possible to achieve the project goal with a high degree of certainty, and the causal relationship between the project goal and outputs is clear.

Regarding the project's indicators, they consist of objectively determinable facts and quantitative figures, and are indicators that enable clear judgment of whether or not the project has achieved its goal.
From the above, the effectiveness of the project content is considered to be high.

2) Prospects for achieving a project goal and outputs

The development of the model (Outcome 1) is to improve the sustainable water management model developed in the previous project so that it can function in large-scale irrigation areas. Regarding the promotion of the use of private service providers (Outcome 2), the initial activity is a survey of local private service providers, which is designed to enable the development of realistic activities according to local conditions based on the survey. With regard to the development of a model dissemination system (Outcome 3), trainings and model expansion meetings for WMTs who played a role in promoting model dissemination in the previous project are positioned as the core activities, and are designed to make use of the know-how gained from the previous project.

In addition, a project goal have been set so that each output can be achieved with a high degree of certainty.

Overall, it is judged that it is quite possible to achieve the project purpose and outputs.

3) Possibility of satisfing prerequisites and external conditions

The following conditions have been established as prerequisites. In particular, the security situation must be closely monitored.

- The security situation in the target governorates will not worsen.
- Overseas travel of Japanese experts will not be severely restricted.

The following external conditions are also set. In particular, trends in security and financial issues need to be closely monitored.

- Serious security problems will not occur.
- Serious climate problems will not occur.
- Serious financial problems will not occur
- Frequent turnover of counterparts will not occur.

(4) Efficiency

1) Utilization of results from the previous project

As mentioned above, this project aims to improve the water management model developed and disseminated in the previous project through practical application in the field so that the model will work in large-scale irrigation areas, as well as to add various activities to strengthen cooperation with the private sector. Therefore, the project is premised on the know-how and results accumulated in the previous project, and it is expected that this work can be carried out efficiently by fully understanding and utilizing such know-how and results.

2) Human input

< Inputs from Japan >

The project plans to assign experts in six areas: 1) Team leader/WUA Policy, 2) Participatory Irrigation Management, 3) On-farm Water Management, 4) Private Sector Development, 5) Contracts, Accounting and Auditing, and 6) Training Planning/Project Coordination. The experts will be assigned in the way of short-term, repeated overseas trips, which will enable the experts to be dispatched at the right time for the required activities. In addition, the work in Iraq will require the use of security services, and the most efficient number of experts to travel at one time is four, due to the capacity of the security vehicles. Therefore, the cost of security services can be minimized by having four experts on site at all times for each round of field work. Furthermore, in the preceding case, the actual number of working days for each round of field work, excluding travel days, was set at about two weeks, so it was important to make efforts to encourage activities on the Iraqi side in the absence of the Japanese experts. Therefore, at the end of each field assignment, the Japanese experts fully discussed with the Iraqi side about the activities in the absence of Japanese experts, and a system had been established whereby local activities could be smoothly

implemented even in the absence of experts by employing national staff. By following such a system, it is possible to ensure efficient operations.

<Inputs from Iraqi side >

As in the previous project, the Iraqi side plans to assign counterparts at two levels, one at the central ministry level and the other at the governorate level. Officials from the Ministry of Water Resources and the Ministry of Agriculture will be assigned at the ministry level, and officials from the Directorate of Water Resources and the Directorates of Agriculture will be assigned at the governorate level, thus creating a system in which counterparts from the water resources and agriculture sides will be assigned at both levels and work in close collaboration. This is based on the fact that the Iraqi side has accumulated expertise in implementing projects based on cooperation between the central and local governments and between water resources and agriculture through the previous project, and can be evaluated as a system that enables efficient implementation of the project.

3) Physical input

In this project, activities are planned to contribute to the improvement of irrigation water management in the model sites, and it is assumed that there will be a need for equipment and other inputs. For example, a laser land leveler and a multi-crop bed planter are expected to be used to improve on-farm water management. In the previous project, the dissemination of use of the laser land leveler was particularly successful, but the lesson learned is that the dissemination of the laser land leveler will be limited if farmers in the model sites have tractors above a certain standard and these tractors are not available (or if they are above a certain standard but are older and more fragile). Therefore, taking those lessons into account when introducing the equipment will contribute to efficient implementation of the work. In addition, by setting aside a certain amount of money for pilot projects that contribute to improving off-farm water management and maintenance, such as repairing gates and reshaping irrigation canals at model sites, it is expected to have the effect of giving farmers a real sense of improvement. However, it will be important for efficient implementation of the project to take care not to undermine farmers' sense of self-help.

4) Others

a) Items to be borne by Iraqi side

The costs of domestic activities of Iraqi officials need to be borne by the Iraqi side, and as in the preceding case, it is necessary to ensure that the Iraqi side is fully informed.

b) Collaboration with other projects

JICA is planning to rehabilitate irrigation facilities at the WUA site and construct irrigation facilities in a large-scale irrigation area as part of the Irrigation Sector Loan Project (Phase 2) in Iraq, and it is expected to have a synergistic effect between the hardware development by the loan project and the software support by the techinical cooperation project, which will contribute to the efficient implementation of the entire JICA assistance to Iraq.

c) Third country training

The project plans to conduct third-country training in neighboring countries as activities progress and

needs dictate. The project is expected to effectively and efficiently promote not only cooperation activities within Iraq, but also capacity building by utilizing diverse resources.

(5) Impact

1) Prospect of achieving the overall goal

The overarching goal of the project is "to disseminate the sustainable water management model in large irrigation districts to target areas throughout Iraq," and the indicator for achieving this goal was set as "WUAs will be established in X or more large irrigation areas and a cycle of PIDP preparation, implementation, and revision will be undertaken".

If the sustainable water management model is established and disseminated in large irrigation districts through the activities of this project, the progress of its dissemination will be judged by quantitative indicators, and the causal relationship with the project goal is clear.

2) Expected positive impact

a) Strengthening the organization of administrative agencies that support WUA

In the previous project, the Water Management Section under the Planning and Follow-Up Office of the Ministry of Agriculture was reorganized into the Section of On-farm Water Management and WUA. This has made it possible for the Ministry of Agriculture, in addition to the Ministry of Water Resources, to officially handle WUA. As for the WUA promotion system at the governorate level in the Ministry of Agriculture, on-farm water management and WUA sections were established in HQ offices in each governorate in 11 of the 15 goveronratess (the other 4 governorates are under the progress).

Furthermore, for the Dorectorate of Water Resources, in addition to the WUA section established in each governorate HQ, a WUA officer was assigned by a ministerial order to each District Office in each goveronrate (concurrently performing other duties).

Thus, during the implementation of the previous project, there was an impact of strengthening the organization of administrative agencies supporting WUAs, and it is expected that this project will also strengthen the organizational structure that contributes to strengthening participatory management in large-scale irrigation areas.

b) Improving farmers' income

In the previous project, 11 laser land levelers were operated at and near the model and model extension sites during the 2023-24 winter cropping season. Three of these units were provided by JICA in Stage 1, while the remaining eight units were purchased by farmers. These 11 LLLs were used by a total of 246 farmers, and 2,658 ha (10,632 donam in total) were leveled.

At the Al Okaily WUA model site, field leveling with LLL resulted in a 43% yield increase and 35% irrigation time reduction for wheat (average of 10 farmers in the 2019/20 winter cropping season) compared to traditional irrigation (conventional irrigation). The 43% increase in yield means a 43% increase in farm income in wheat marketing. The 35% decrease in irrigation hours also means a 35% decrease in operating costs (diesel fuel costs) for individual pumps. Quantitative data on yield increase and

irrigation time reduction at other sites are not available, but assuming results similar to Al Okaily WUA, it is assumed that 2,658 ha (246 farmers) had a significant impact on increasing farmers' real income.

The project is also expected to promote LLL extension in large irrigated areas, which is expected to have a positive impact on increasing farmers' real income.

c) Gender

The water management model promotes collaborative activities by local farmers, and its basic concept is based on participation and equality of all households (equal participation in decision-making, fair water distribution, and equal burden of water use costs). Thus, there are aspects that promote social inclusion and community strengthening. In a previous project, a separate women's group was established for women farmers who could not participate in the general assembly (a practice based on religious and cultural circumstances in rural areas), and efforts were made to ensure women farmers' participation in decision-making. It is expected that similar efforts will be continued and strengthened in this project, and a certain impact on gender mainstreaming can be expected.

3) Anticipated negative impacts

No notable negative impacts are foreseen. However, when implementing project activities in the model sites, it is necessary to take care to avoid differences in treatment by social class and ethnicity, for example, by involving diverse farmers, not only those with high productivity, but also those who are engaged in relatively small-scale farming. With regard to gender, promoting affirmative action (positive measures to correct discrimination) is expected to have the effect of reducing disparities based on gender and encouraging women to advance in society.

(6) Sustainability

1) Policy aspect

The National Development Plan (2018-2022) sets food security and effective use of water resources as key development goals for the agriculture and water resources sector, in light of declining water resources. The project objectives in this project are considered to make a significant contribution to these goals of the National Development Plan. In addition, SWLRI has an "institutional reform" focus on strengthening WUAs in conjunction with improving irrigation efficiency. The project aims to strengthen WUAs in large irrigated areas, which is consistent with SWLRI's direction. Therefore, sustainability in terms of policy is expected to be ensured.

2) Organizational and institutional aspects

At the central governmental level, the Ministry of Water Resources has a WUA department and the Ministry of Agriculture has an on-farm water management and WUA section. At the goveronrate level, the Directorate of Water Resources has a WUA section, and the Directorate of Agriculture has an on-farm water management and WUA section (on-farm water management and WUA sections have been established in only 11 of the 15 goveronrates). These departments/sections are in charge of WUA promotion as a routine task, and institutional sustainability is considered to be ensured.

3) Financial aspect

The cost of WUA support activities at the central govermental level will be paid from the operating budgets of the Ministry of Water Resources and the Ministry of Agriculture. In addition, the Ministry of Water Resources provides trainings related to WUA to staff members of the Dorectorates of Water Resources and the Directorates of Agriculture. On the other hand, the cost of WUA support activities in each goveronrate is paid from the operating budgets of the Directorates of Water Resources and the Directorates of Agriculture.

Therefore, activities can continue as long as Iraq's financial situation does not deteriorate to an extreme degree. However, there are cases, especially on the side of the Ministry of Agriculture, where activity expenses may not be appropriately disbursed, so it is necessary to monitor the situation closely during project implementation and request support from the Director Generals or the Minister as appropriate.

4) Technical aspects

In the previous project, the water management model was defined as "a cycle of water management improvement through formulation, implementation, and revision of Participatory Irrigation Development Plan (PIDP) which is carried out by WUAs with the support of WMT (Officials of Directorate of Water Resources and Directorate of Agriculture)". The specific contents of water management to be included in the PIDP were categorized into 1) WUA management (operation of meetings and collection of OMM subscription), 2) maintenance of irrigation facilities (periodical inspection and necessary maintenance), 3) off-farm water management (establishment of fair water distribution rule and simple lining method), 4) on-farm water management (irrigation scheduling, water-saving irrigation), and 5) facility planning (basic plan of improvement of irrigation facilities).

The PIDPs based on these definitions and classifications have been approved by the General Assembly of 19 WUAs for the winter 2023-24 cropping season, and it can be evaluated that the WMTs in each governorate have acquired basic skills in the dissemination of water management models. The main activity of this project is to improve and disseminate the model so that it can work in large irrigated areas, and it is considered that the WMTs in each governorate who have acquired the skills through the previous project have the basis for technical sustainability.

However, if the water management model developed in the previous project is to be applied to large-scale irrigation areas, two improvements are essential: 1) water users groups and their farmer representatives should be assigned to each distributary canal or watercourse, and PIDPs should be formulated reflecting the wishes of these farmer reprepsentatives (by general meetings of farmer representatives of each distributary canal or watercourse) and 2) a governmental official is dispatched as the WUA manager with a secretariat (operational office) is organized and functions under the manager.

In this regard, the former case (farmer representatives of distributary canal or watercourse) can be regarded as a development of the activity of the previous project, in which the WUA area was divided into several irrigation blocks and farmer leaders were assigned for formulating fair water distribution rules. The latter (WUA manager with an operational office) is an implementation of the revised WUA Instructions, which include an article stating that a WUA manager is to be assigned by the government.

Therefore, through trial and error to make these improvements work in the field, it is considered possible to construct an improved model that is sustainable and can be widely used.

Therefore, it is considered possible to construct an improved model that can be sustainable and diffuse through trial and error so that these improvements can function through activities at the field level.

5) Social, cultural and environmental aspects

The water management model developed in the previous project promotes collaborative activities by local farmers and is based on the basic concept of participation and equality of all local farmers (equal participation in decision-making, fair distribution of water, and equal burden for OMM subscription). Thus, there is an aspect of promoting social inclusion and strengthening community cohesion. In addition, the previous project is promoting gender mainstreaming, with specific actions of imparting water management knowledge to women farmers and participation of women farmers in decision-making, which is also described and utilized in the manual of the previous project.

Thus, with regard to the social and cultural aspects, there are no obstacles to the sustainable effects of the project.

On the other hand, with regard to the environmental aspect, it should be noted that the flow rate of the Tigris-Euphrates River, which is the main source of water for irrigated agriculture, has decreased significantly in recent years. From the viewpoint of promoting participatory management in irrigated areas, a certain level of water resource constraint has the positive effect of making farmers aware of the necessity and importance of water management, but at the same time, if farmers are forced to stop farming or leave their farms due to a decrease in water resources, it may be necessary to change the model site. The situation needs to be monitored closely.

5.3.3 Monitoring and Evaluation

Activities related to monitoring and evaluation include holding a JCC meeting once a year and preparing and submitting a monitoring sheet every six months. In addition, an end-term evaluation will be conducted approximately 6 months prior to the end of the project. An ex-post evaluation is envisaged to be conducted three years after the end of the project.

Attachment 1

Dissemination progress of the water management model in each governorate (Winter, 2021-22)

Prefecture/Region	Progress of water management improvement activities based on PIDP
Salah ud-Din	**<Agricultural Plan and PIDP approval (2021/22 winter)>** Agricultural plan：0% PIDP approval: None **<Support to WUA by governorate staff (January to July, 2022)>** Frequency of visits: about 3 times a month Frequency of phone calls/WhatsApp: Frequent Cooperation between DoWR & DoA: Not good (a meeting was held in February) **<Improvement of water management based on PIDP>** Activities: No
Ninevah.	**<Agricultural Plan and PIDP approval (2021/22 winter)>** Agricultural plan: 50%. PIDP approval: 2021/11/2 **<Support to WUA by governorate staff(January to July, 2022)>** Frequency of visits: 5 times Frequency of phone calls/WhatsApp: Frequent Cooperation between DoWR & DoA: Good **<Improvement of water management based on PIDP>** Meeting: 3 board meetings were held. Subscription: 25,000 IQD/farmer at the beginning of the season (100% collection rate) Maintenance: Inspection and maintenance records are kept. Water distribution: Yes, for Linear sprinklers. Water saving method: Linear sprinklers are placed throughout the area.
Kirkuk	**<Agricultural Plan and PIDP approval (2021/22 winter)>** Agricultural plan: 50%. PIDP approval: 10/28/2021 <Support to WUA by governorate staff (January to July, 2022)> Frequency of visits: 3 times Frequency of phone calls/WhatsApp: Once every 10 days Cooperation between DoWR & DoA: Good **<Improvement of water management based on PIDP>** Meeting: Board meeting held every month. Subscription: 1,000/IQD/farmer (100% collection rate) Maintenance: Record is kept. Water distribution: WUA area is divided into 3 blocks and irrigated in rotation. Water-saving irrigation: Laser leveler is not available and there is no leveling. Number of farmers with sprinklers increased from 5 to 22. Number of farmers with drip irrigation increased from 2 to 6 (WMT held a briefing session). **<Others>** There are general issues such as transportation costs and concurrent work with other duties (busyness). 8 WUAs out of 62 in the governorate are functioning well.
Babil.	**<Agricultural Plan and PIDP approval (2021/22 winter)>** Agricultural plan: 50% (Actual: 85%, summer crop in 2022 is about 30%) PIDP approval: 10/28/2021 **<Support to WUA by governorate staff (January to July, 2022)>** Number of visits: 5 visits. Frequency of phone calls/WhatsApp: 3 times a month. Cooperation between DoWR & DoA: Good (100m). **<Improvement of water management based on PIDP>** Meetings: Board meeting was held once a month. Subscription: 6,000/farmer/season. 20-25% payment (downstream only). 200 are members although there are 350 farmers in the area. Spend most money on cleaning. Maintenance: maintenance record is kept. WUA refuses to accept to keep inspection records because they are done on a daily basis. But the WUA agreed to keep a record of inspections when there is a problem. Water distribution: Rotational irrigation is implemented within each water course. There are 25 water courses with leaders. Gates in water courses are opened and closed. No

Prefecture/Region	Progress of water management improvement activities based on PIDP
	rotation among water courses. Simple lining: 2 farmers tried it, but no record. The year before that, one farmer tried it and recorded the results, but the calculation results indicated that it did not continue. Water-saving irrigation: No levelers. 10-15 nonmembers are using drip irrigation.
Najaf	**<Agricultural Plan and PIDP approval (2021/22 winter)>** Agricultural plan: 100%. PIDP approval: 2021/9/7 <Support to WUA by governorate staff (January to July, 2022)> Frequency of visits: 4 times (WUA also visited the governorate office 5 times) Frequency of phone calls/WhatsApp: Once every 5 days Cooperation between DoWR and DoA: Good (distance between offices: 100m) **<Improvement of water management based on PIDP>** Meeting: Board meeting is held every month. Subscription: Leading farmers pay the necessary expenditures for OMM. The total amount finally disbursed is paid equally among members later. Maintenance: Records are kept. Water distribution: There are a total of 20 sprinklers in the area, all of which take water from wells. The WUA area is divided into three groups and irrigated rotationally among the wells. Members with wells located close to each other are spread out in the grouping. Water-saving irrigation: The winter crop is wheat. But the area of maize has been expanded from 60 to 180 donum for the summer season. Also, a farmer is now trying soybean with 0.5 donum. This is based on the fact that there is a need for a Lebanese company to purchase maize soybean. **<Others>** The WUA is doing quite well, according to the evaluation of governorate officials.
Karbala	**<Agricultural Plan and PIDP approval (2021/22 winter)>** Agricultural plan: 50%. PIDP approval: 2021/11/2 <Support to WUA by governorate staff (January to July, 2022)> Frequency of visits: Once a month Frequency of phone calls/WhatsApp: Once a week Cooperation between DoWR & DoA: Good (distance between offices: 3km) **<Improvement of water management based on PIDP>** Meeting: 5 board meetings were held. Subscription: Leading farmers pay for necessary repairs, and other farmers pay by cultivated area after the season (Unit price of the subscription is not described in the PIDP). Maintenance: Records are kept by DoWR. Water distribution: There are water distribution rules within each common pump in addition to among five common pumps. Water-saving irrigation: N.A. Irrigation scheduling: No implementation due to water shortage. One farmer implemented it in winter 2022/21, and the yield was the same but irrigation time was reduced.
Ishaqi.	**<Agricultural Plan and PIDP approval (2021/22 winter)>** Agricultural plan: 50%. PIDP approval: 10/27/2021 **<Support to WUA by governorate staff (January to July, 2022)>** Frequency of visits: 3 visits (WUA also visited the govenrate office 5 times) Frequency of calls/WhatsApp: 1-2 times in a week Cooperation between DoWR & DoA: Bad (although the offices are on the same street) **<Improvement of water management based on PIDP>** Meeting: About 5 meetings of the board members were held. Subscription: Members pay necessary amount depending on necessity as described in the PIDP. There is a record book, and the contents have been shown to all farmers. Maintenance: There is a record book. Gates were replaced. The cost of the gates was paid by the government and the gates were installed by the WUA. Water distribution: All farmers reduced cultivated area 50% with water distribution rule. Water-saving irrigation: Lining reservoirs for drip irrigation with polythene sheets was expanded from 2 to 15 donam (1 to 5 farmers) in the summer season. The crops were yellow melons and tomatoes. The reservoirs without polythene sheets ran out of water in

Prefecture/Region	Progress of water management improvement activities based on PIDP
	one day, but the reservoirs with polythene sheets had water remaining for three days. **<Others>** Transportation costs and strengthening the relationship with DoA is an issue. The governorate officials evaluated the WUAs were functioning very well. Farmers themselves recognize the necessity of the WUA function, but they are looking for a difference (incentive) from non-members.
Musayab	**<Agricultural Plan and PIDP approval (2021/22 winter)>** Agricultural plan: 50%. PIDP approval: 10/24/2021 **<Support to WUA by governorate staff (January to July, 2022)>** Number of visits: 5 visits Frequency of phone calls/WhatsApp: 2-3 times a week Cooperation between DoWR & DoA: Good (distance between offices is 100m) **<Improvement of water management based on PIDP>** Meeting: 3 board meetings were held. Subscription: 250 IQD/donum/month; some farmers pay late, but collection rate is 100%. Maintenance: A record book is kept. WUA started keeping records recently. Water distribution: WUA divided the area into 3 blocks, and each block takes water rotationally on a daily basis. Water-saving irrigation: In 2018/19, a laser leveler was borrowed from the wheat program to level at 10donum, but several farmers later purchased their own laser leveler, and in 2021/22, more than 75% of the area was leveled (1200/1600 donum). Farmers confirmed the results in the field, and governorate staff conducted seminars. **<Others>** Own evaluation by the WUA is very high. Evaluation of the WUA by governorate officials was 50 points WUAs are looking for differences (incentives) from non-members.
Diyala	**<Agricultural Plan and PIDP approval (2021/22 winter)>** Agricultural plan：0% PIDP approval: None **<Support to WUA by governorate staff (January to July, 2022)>** Frequency of visits: 1 visit Frequency of phone calls/WhatsApp: 3 times Cooperation between DoWR & DoA: Bad **<Improvement of water management based on PIDP>** Activities: No
Anbar	**<Agricultural Plan and PIDP approval (2021/22 winter)>** Agricultural plan: 50%. PIDP approval: None (Agricultural plan was approved in September, but PIDP was not approved in time) **<Support to WUA by governorate staff (January to July, 2022)>** Frequency of visits: 1-2 visits Frequency of phone calls/WhatsApp: Twice a month Cooperation between DoWR & DoA: Normal **<Improvement of water management based on PIDP>** Activities: No **<Others>** Governorate officials want incentives for farmers to accept the WUA.
Baghdad	**<Agricultural Plan and PIDP approval (2021/22 winter)>** Agricultural plan：0% PIDP approval: None **<Support to WUA by governorate staff (January to July, 2022)>** Frequency of visits: N.A Frequency of phone calls/WhatsApp: N.A Cooperation between DoWR & DoA: N.A **<Improvement of water management based on PIDP>** Activities: No **<Other>** Since the target WUA is likely to have 0% agricultural plan next winter (2022/23), other WUAs will be selected to formulate PIDPs.

Prefecture/Region	Progress of water management improvement activities based on PIDP
	Issues related to WUAs include: 1) Delay in receiving payment from the government after selling wheat (Ministry of Trade), which affects the collection of subscription; 2) Water intake sometimes cannot be done due to power shortages; and 3) Old pumps need to be replaced.
Mabain Al-Nahrain	**<Agricultural Plan and PIDP approval (2021/22 winter)>** Agricultural plan: 50%. PIDP approval: 10/26/2021 **<Support to WUA by governorate staff (January to July, 2022)>** Frequency of visits: 2 visits Frequency of phone calls/WhatsApp: 2-3 times a month Coordination between DoWR & DoA: Good (distance between offices is 20km) **<Improvement of water management based on PIDP>** Meeting: 4 board meetings were held. Subscription: 25,000 IQD/farmer, paid by all members in September 2021; due to water shortage in March 2022, the water source was changed to wells (3 old wells with old pumps). An additional 25,000 IQD was paid by all members accordingly. Maintenance: records are kept. Water distribution: No irrigation block, but all farmers take turns to irrigate water one by one. Water-saving irrigation: Leveling by laser leveler was expanded from 10 donum in 2020/21 to 100 donum, which was implemented by all 30 farmers. In the first year, the effects were compared with those of conventional irrigation and explained to the members. **<Others>** Evaluation of target WUAs by locality officials was 80 points.
Missan	**<Agricultural Plan and PIDP approval (2021/22 winter)>** Agricultural plan：0%→Farmers earn income mainly from livestock PIDP approval: None **<Support to WUA by governorate staff (January to July, 2022)>** Frequency of visits: 2visits Frequency of phone calls/WhatsApp: Once every 10 days. Cooperation between DoWR & DoA: Good (distance between offices is 1 km) **<Improvement of water management based on PIDP>** Activities: No In 2020/21, one farmer purchased a laser leveler (made in Iran, about 1.2 million yen) and had already leveled 100donum, so it is regrettable that no progress was made.
Wasit.	**<Agricultural Plan and PIDP approval (2021/22 winter)>** Agricultural plan：50% PIDP approval: 2/11/2021 **<Support to WUA by governorate staff (January to July, 2022)>** Frequency of visits: No visits Frequency of phone calls/WhatsApp: DoWR is 0 time and DoA is 1 time. Cooperation between DoWR & DoA: No (distance between offices is 500 m) **<Improvement of water management based on PIDP>** Activities: N.A
Muthanna	**<Agricultural Plan and PIDP approval (2021/22 winter)>** Agricultural Plan: 50% (But actually, only 10% of the targeted WUAs (20/91 farmers) could be irrigated) PIDP approval: None **<Support to WUA by governorate staff (January to July, 2022)>** Frequency of visits: 2visits Frequency of phone calls/WhatsApp: Once every 2 weeks Cooperation between DoWR & DoA: Normal **<Improvement of water management based on PIDP>** Activities: No
Diwaniya	**<Agricultural Plan and PIDP approval (2021/22 winter)>** Agricultural plan: 50%. PIDP approval: 10/28/2021 <Support to WUA by governorate staff (January to July, 2022)> Frequency of visits: Once a month Frequency of phone calls/WhatsApp: Frequent

Prefecture/Region	Progress of water management improvement activities based on PIDP
	Cooperation between DoWR & DoA: Nomal **<Improvement of water management based on PIDP>** Number of members: Expanded from 108 to 300 (400 farmers in the area). The number of female members also increased from 8 to 15. Members were given the right to elect board members, which was an incentive to increase membership. Meetings: The corona decreased and meetings were revived. But the number of board meetings was n.a. Subscription: 1,000 IQD/member/month. Collection rate is 95%. Maintenance: There is a record book. However, it is not complete and further training is needed. Water distribution: Rotational irrigation was conducted. All members equally reduced farmland by half. Water-saving irrigation: Grader leveling was implemented; started in 2020/21 and expanded to 45 farmers in the second year. It is reported on the personal Facebook page of the head of the WUA. In the first year, 40% reduction in water consumption compared to conventional irrigation has been confirmed. **<Others>** The cost of conducting training (transportation, printing, and location) is a general issue. Governorate officials want to provide differences (advantages) from non members.

Attachment 2

Dissemination progress of the water management model in each governorate (Winter, 2022-23)

Prefecture/Region	Progress of water management improvement activities based on PIDP
Salah ud-Din	**<Agricultural Plan and PIDP approval (2022/23 winter)>** Agricultural plan: 0% PIDP approval: None **<Support to WUA by governorate staff (August 2022 to January 2023)>** Frequency of visits: Approximately 3 times a month Frequency of phone calls/WhatsApp: Frequent (20 times/month) Cooperation between DoWR & DoA: Normal (Telephone only) **<Improvement of water management based on PIDP>** Activities: None
Ninevah	**<Agricultural Plan and PIDP approval (2022/23 winter)>** Agricultural plann: 25% PIDP approval: None **<Support to WUA by governorate staff (August 2022 to January 2023)>** Frequency of visits: 3 times Frequency of phone calls/WhatsApp: Normal (2 times/month) Cooperation between DoWR & DoA: Good **<Improvement of water management based on PIDP>** No PIDP approval, but the following was implemented. Meetings: Three meetings of the board members OMM subscription: 25,000 IQD/farmer (same as last year) Maintenance: Inspection and maintenance records available Water distribution rule: Yes (Linear sprinklers are installed throughout the area)
Kirkuk	**<Agricultural Plan and PIDP approval (2022/23 winter)>** Agricultural plan: 25% PIDP approval: Yes **<Support to WUA by governorate staff (August 2022 to January 2023)>** Frequency of visits: 3 times Frequency of phone calls/WhatsApp: Normal (2 times/month) Cooperation between DoWR & DoA: None (Mainly due to personnel changes in DoA) **<Improvement of water management based on PIDP>** Meetings: Board meetings are held monthly. OMM subscription: 1,000 IQD/month/farmer Maintenance: Inspection and maintenance records available Water distribution rule: Yes Water-saving irrigation: The number of farmers with sprinklers was further increased covering about 50% of the total area.
Babil.	**<Agricultural Plan and PIDP approval (2022/23 winter)>** Agricultural plan: 25% (50% after heavy rainfall) PIDP approval: Yes **<Support to WUA by governorate staff (August 2022 to January 2023)>** Frequency of visits: 10 times Frequency of calls: 1-2 times/week Cooperation between DoWR & DoA: Good **<Improvement of water management based on PIDP>** Meetings: Board meetings are held monthly. OMM subscription: 6,000 IDQ/farmer/cropping season. The policy is to secure the necessary amount by additional payment by midstream and downstream farmers because upstream farmers are not willing to pay. The main use of OMM subscription is for cleaning of irrigation canals. Maintenance: Inspection and maintenance records available Water distribution rule: Yes (Same as last year) Simple lining: No Water-saving irrigation: Due to the good results of demo farms in the past, one farmer purchased a laser-land leveler and rent it to other farmers. As a result, farm fields of 8 farmers are leveled (41 donam in total). In addition, two farmers have introduced drip irrigation.
Najaf	**<Agricultural Plan and PIDP approval (2022/23 winter)>**

Prefecture/Region	Progress of water management improvement activities based on PIDP
	Agricultural plan: 100% (No water restriction due to center-pivot sprinklers installed with groundwater as the water source) PIDP approval: Yes **<Support to WUA by governorate staff (August 2022 to January 2023)>** Frequency of visits: 1 time (But WUA separately visited DoWR office 4 times) Frequency of phone calls/WhatsApp: 4 times/month Cooperation between DoWR & DoA: Good **<Improvement of water management based on PIDP>** Meetings: Board meetings are held monthly. OMM subscription: 1000 IQD/donam/season (6 months). Last year, the amount collected was 8.4 million IQD. Three staff members are employed by OMM subscription (all three are paid 450,000 IQD/month/person during winter cropping season (6 months) for their work as collection of OMM subscription, maintenance, and guard). They can cover the entire WUA area on their own motorcycles, and the WUA also pays for gas. Maintenance: Only if there is a problem, it will be noted in the record book. Water distribution rule: Yes (Same as last year) Water-saving irrigation: Sprinklers have been installed throughout the area.
Karbala	**<Agricultural Plan and PIDP approval (2022/23 winter)>** Agricultural plan: 25% (35% after heavy rainfall) PIDP approval: Yes **<Support to WUA by governorate staff (August 2022 to January 2023)>** Frequency of visits: 3 times Frequency of calls: 8 times/month Cooperation between DoWR & DoA: Good (Always go to the field together) **<Improvement of water management based on PIDP>** Meetings: Five board meetings were held. OMM subscription: The leading farmer pays for the necessary repairs, and after the season the other farmers pay by area of farmlands (Same as last year). Maintenance: Record book available Water distribution rule: Yes (Same as last year) Water-saving irrigation: The use of sprinkler or drip irrigation has increased from 20% in 2014 to 95% of the area now.
Ishaqi	**<Agricultural Plan and PIDP approval (2022/23 winter)>** Agricultural plan: 25% (50% after heavey rainfall) PIDP approval: Yes **<Support to WUA by governorate staff (August 2022 to January 2023)>** Frequency of visits: 1 time/month Frequency of calls: Frequent Cooperation between DoWR & DoA: Bad (transfer of people in DoA) **<Improvement of water management based on PIDP>** Meetings: 3 board meetings (once every 2 months) OMM subscription: 2,000 IQD/donam to be paid after the cropping season Maintenance: Record book available Water distribution rule: Yes Water-saving irrigation: The water-saving method of placing polyethylene sheets in drip irrigation reservoirs is being implemented with different types of sheets.
Musayab	**<Agricultural Plan and PIDP approval (2022/23 winter)>** Agricultural plan: 0% PIDP approval: None **<Support to WUA by governorate staff (August 2022 to January 2023)>** Frequency of visits: 0 time Frequency of calls: 0 time Cooperation between DoWR & DoA: Almost none **<Improved water management based on PIDP** Activities: None
Diyala	**<Agricultural Plan and PIDP approval (2022/23 winter crop)** Agricultural plann: 0% PIDP approval: None **<Current status of WUA support by county staff (2022/8-2023/1)** Frequency of visits: 0 time Frequency of calls: 0 time

Prefecture/Region	Progress of water management improvement activities based on PIDP
	Cooperation between DoWR & DoA: Almost none **<Improved water management based on PIDP** No activity
Anbar	**<Agricultural Plan and PIDP approval (2022/23 winter crop)** Agricultural plan: 25% PIDP approval: Yes **<Current status of WUA support by county staff (2022/8-2023/1)** Frequency of visits: 2 times (WUA visited DoWR) Frequency of calls: 4 times/month Cooperation between DoWR & DoA: Good (Monthly meetings & weekly phone calls) **<Improved water management based on PIDP** Meetings: Board meetings are held monthly. OMM subscription: This winter, the fee will be collected when necessary expenditures arise. Until last year, a pump operator was hired by the WUA, but the need for regular collection has decreased since the pump operator has been switched to government employment. Maintenance: Records available (But maintained by the government-employed operator). Water distribution rule: Yes Water-saving irrigation: no particular progress.
Baghdad	**<Agricultural Plan and PIDP approval (2022/23 winter crop)** Agricultural plan: 0% PIDP approval: None **<Current status of WUA support by county staff (2022/8-2023/1)** Frequency of visits: 2 times Frequency of calls: Frequent Cooperation between DoWR & DoA: Good **<Improved water management based on PIDP** Activities: None
Mabain Al-Nahrain	**<Agricultural Plan and PIDP approval (2022/23 winter crop)** Agricultural plan: 10% PIDP approval: None **<Current status of WUA support by county staff (2022/8-2023/1)** Frequency of visits: 3 times Frequency of calls: 5 times/week Cooperation between DoWR & DoA: Good **<Improved water management based on PIDP** Activities: None
Missan	**<Agricultural Plan and PIDP approval (2022/23 winter crop)** Agricultural plann: 25% PIDP approval: Yes **<Current status of WUA support by county staff (2022/8-2023/1)** Frequency of visits: 4 times Frequency of calls: at least once a week Cooperation between DoWR & DoA: Good **<Improvement of water management based on PIDP>** Meetings:: Board meetings are held monthly. OMM subscription: 500,000 IQD for individual pumps of 75 HP or more and 250,000 IQD for pumps less than 75 HP shall be collected from WUA members after the cropping season. Maintenance: Record book available Water distribution rule: Yes Water-saving irrigation: One farmer purchased a laser-land leveler last year. Area with leveling expanded to 500 donam (3 farmers) this winter by lending the leveler.
Wasit	**<Agricultural Plan and PIDP approval (2022/23 winter)>** Agricultural plan: 25% PIDP approval: None **<Support to WUA by governorate staff (August 2022 to January 2023)>** Frequency of visits: N/A (The main person of DoWR was replaced just 2 days ago, no information about the previous person) Frequency of calls: N/A

Prefecture/Region	Progress of water management improvement activities based on PIDP
	Cooperation between DoWR & DoA: N/A **<Improvement of water management based on PIDP>** Activities: Unknown
Muthanna	**<Agricultural Plan and PIDP approval (2022/23 winter)>** Agricultural plan: 25% PIDP approval: None **<Support to WUA by governorate staff (August 2022 to January 2023)>** Frequency of visits: 3 times Frequency of calls: 3 times/week Cooperation between DoWR & DoA: Normal **<Improvement of water management based on PIDP>** Activities: None
Diwaniya	**<Agricultural Plan and PIDP approval (2022/23 winter)>** Agricultural plan: 25% PIDP approval: Yes **<Support to WUA by governorate staff (August 2022 to January 2023)>** Frequency of visits: 5 times Frequency of calls: Frequent Cooperation between DoWR & DoA: Good **<Improvement of water management based on PIDP>** Meetings: Five meetings of the board were held. OMM subscription: 1,000 IQD/member/month. Maintenance: Inspection and maintenance records available. Water distribution rule: Yes Water-saving irrigation: No particular progress was made this winter, although grader leveling was implemented last year.

Attachment 3

Revised Proposal of the WUA instructions (The final-draft Ver.1)

Based on the provisions of paragraphs (c) and (e) of Clause (Third) of Article (5) of the Irrigation and Earthmoving Networks Maintenance Law No. (12) of 1995 , as amended, we have issued the following :instructions

()Instructions for Associations of Beneficiaries of the Shared Water Source()

Introduction : The purpose of these instructions

association or a federation of a number of associations, in the application of the provisions of these instructions, is considered to be a beneficiary of the shared water source for a specific or indefinite period consisting of natural persons (the beneficiaries of the shared water source). All beneficiaries of the shared water source are required to establish a non-profit association. All beneficiaries of the shared water source are required to establish a non-profit association based on teamwork. For members to manage and operate the water resource and participate in the maintenance between the Ministry of Water Resources and the beneficiaries of the shared water resource, and its For members to manage and operate the water resource and participate in the maintenance between the Ministry of Water Resources and the beneficiaries of the .shared water resource, and its objective is non-profit and it enjoys legal personality

:Article (1) Articles of Incorporation of the Association

1. Submitting an application to establish an association by at least two-thirds of the beneficiaries of the shared water resource, and it is binding for the rest of the beneficiaries to belong to the association upon approval. Submitting an application to establish an association by at least two-thirds of the beneficiaries of the shared water resource, and it is binding for the beneficiaries .to belong to the association upon approval
2. A list of signed names of members of the beneficiaries who have a legal relationship to the land within the geographical area of the association with the area of each beneficiary. area of each .beneficiary
3. .By-laws of the association

:Article (2) The articles of the association's bylaws and the place

:The association's bylaws must include

1. The name of the association, provided that it is derived from its purpose and does not lead to .confusion between it and another association with which it shares its geographical scope of work
2. Water users who have a legal relationship with agricultural lands are bound by the association's founding contract, which includes all Water users who have a legal relationship with agricultural lands are bound by the association's founding contract, which includes all acts, procedures and .bills due for payment at the end of the use relationship for any reason with the Authority
3. .Scope of work of the association
4. .The address of the headquarters that is taken as a center for managing the association
5. .The name, age and place of residence of each of the members

6. .The assets of the association and the method of exploitation and disposal thereof
7. Determine a representative from among the members of the association to take the incorporation procedures and have a link with the water resources department in the governorate. Determine a representative from among the members of the association to take the incorporation procedures .and have a link with the water resources department in the governorate
8. Opening and organizing records for z Documentation, financial accounts, maintenance, and how to .apply incorporation
9. The association seeks to achieve the objectives stipulated in Paragraph (d) of Clause (Third) of Article (5) of the Law of Maintenance of Irrigation and Earthmoving Networks No. (12) of 1995 .as amended
10. .Work according to the participatory irrigation development plan guide 2020

:Article (3) The internal system of the Federation of Associations

A sub-union of associations of beneficiaries of the common water resource shall be established within the .scope of each governorate. The work shall be under the supervision of the Ministry of Water Resources

1- The federation grants a legal entity the power to sign contracts , file lawsuits in its personal capacity, and plead lawsuits against it, and it can borrow The federation grants a legal entity the power to sign contracts , file lawsuits in its personal capacity, and plead lawsuits against it, and it . can borrow money from private sector sources and use its property as additional security
2- The head or secretary of the Water Users Union is appointed from the Water Resources Directorate. The union represents and acts as the person in whose name the union represents and acts as the person in whose name the union represents and acts on behalf of the union all contracts, pleadings, .legal powers of attorney, statements and written petitions
3- The funds of water user associations are considered as public funds, and their resources consist of what the state allocates to them in the Ministry. Only after the approval of the competent .authorities. Only after the approval of the competent authorities

Article (4) Creation of records for the purposes of documentation, financial accounts, maintenance, and how to apply incorporation

First: The association must keep its documents, correspondence and records in its management center according to a form of these records presented by the First: The association must keep its documents, correspondence and records in its management center according to a form of these records presented by the General Authority for the Operation and Maintenance of the Competent Irrigation Projects before using .them and providing training to the association

.Second: The maintenance and inspection record of irrigation facilities within the association's work area

Third: The association's bylaws and the minutes of its founding include the agreement to establish the .association

Fourth: A list of the names of the beneficiaries who are obligated to belong to the association, their place of residence, and the area of agricultural land for each one of them according to the legal documents proving .his relationship to the land

Fifth: The Water Resources Department is committed to reviewing and auditing the association's records

.on a regular basis

Sixth: The account register includes determining the subscription allowance for members or any financial dealings of the association, as well as the Sixth: The account register includes determining the subscription allowance for members or any financial dealings of the association, as well as the collection receipts of the .members of the association for any amounts disbursed by the association

Seventh: The association's management record includes the mechanism for electing the administrative body of the association, the minutes of the Seventh: The association's management record includes the mechanism for electing the administrative body of the association, the minutes of the meetings held, and .the official and unofficial correspondences to it

.Eighth: The participatory irrigation development plan approved by the members of the association

Article (5) The goals of establishing the association

:The goals of the association include

1. .All associations should seek to have all beneficiaries in the area join the association
2. Maintenance, management and participation in the operation of irrigation facilities in an efficient and economical manner with full and active This includes receiving quantities of water allocated according to the agricultural plan from the Directorate of Water Resources at a specific rate at the entrance of the canal designated for the region and then distributing this water in a fair and timely manner to all The water is then distributed to all farmers according to The procedures and standards agreed upon, according to the diversity of the crop grown or the area to be irrigated, and under the supervision of the water resources departments and the Directorate of Water Resources. The water is then distributed to all farmers in a fair and timely manner according to The procedures and standards agreed upon, according to the diversity of the crop grown or the area to be irrigated, and under the supervision of the water .resources departments and the applicable bidding system
3. Commitment to implement the annual agricultural plan approved by the Ministry of Water Resources and the Ministry of Agriculture, according to the Commitment to implement the annual agricultural plan approved by the Ministry of Water Resources and the Ministry of Agriculture, according to the participatory irrigationdevelopment plan) PIDP .(
4. Estimating subscription fees for water use, operation and maintenance that must be collected from members and non-members from other sources such as Estimating subscription fees for water use, operation and maintenance that must be collected from members and non-members from other sources such as Estimating subscription fees for water use operation and maintenance that must be collected from members and non-members from other sources such as donations from individuals and governmental or non-governmental institutions (civil .society organizations) for financial support or equipment
5. Responsibility for adherence to the implementation of the annual agricultural plan, which was approved by the Ministry of Water Resources and the Ministry of Agriculture, according to .the annual water situation, and to develop a plan for participatory irrigation
6. Training members on the optimal use of water resources And methods that save irrigation .water, in coordination with the staff of the Ministries of Water Resources and Agriculture

7. Carrying out all the necessary periodic and routine inspections and maintenance from the amounts collected by the association resulting from the Carrying out all the necessary periodic and routine inspections and maintenance from the amounts collected by the association .resulting from the application of paragraph (2) above
8. Farmers who are members of the association must use modern irrigation techniques that ration .water use by the Ministry of Agriculture , if available

Article (6) Formation of the general assembly of the association

The general body is the supreme body of the association. The general body of the association consists of .all participating members who are land owners who have a legal link to the land

Article (7) The meeting of the General Assembly

The meeting of the general assembly of the association is considered valid in the presence of the absolute majority of its members or whoever is legally The meeting of the general assembly of the association is considered valid in the presence of the absolute majority of its members or whoever is legally

The meetings of the General Assembly of the Association are held by invitation through one of the available means of communication or by direct The meetings of the General Assembly of the Association are held by invitation through one of the available means of communication or by direct notification (meeting place and date). A copy of the decisions approved in the meeting is sent to the Water Resources Departments within (30) days from the date of its convening. And before the winter or summer agricultural .season

:Article (8) Duties of the General Assembly of the Association

:The tasks of the general assembly of the association are to take the necessary decisions regarding

1. Preparing the necessary operation and maintenance plans for the water supply operations and .following up these operations
2. Providing the necessary competencies, skills, and management methods to ensure that the farmers' interest is fully served and taking all Providing the necessary competencies, skills, and management methods to ensure that the farmers' interest is fully served and taking all necessary measures to maintain the efficiency, safety and sustainability of the irrigation facilities placed at the disposal of the association with the active participation of the members of the association in cooperation with the competent Water Resources Directorate. Providing the necessary competencies, skills and management methods to ensure that the farmers' interest is fully served and taking all necessary measures to maintain the efficiency, safety and sustainability of the irrigation facilities placed at the disposal of the association with the .competent Water Resources Directorate
3. Educating farmers/members and training them to prepare agricultural land appropriately to ration irrigation water and to adopt modern irrigation Educating farmers/members and training them to prepare agricultural land appropriately to irrigation water and to adopt modern irrigation .methods in order to save water and achieve high use efficiency

:Article (9) Duties and tasks of the members of the association

:Each member of the association is bound by the following duties

1. Inform the association's president in writing in the event of legal transfer of ownership or .possession of a plot of land located within the association's work area
2. Types of crops and cultivated areas, taking care to include real data for this in order to take into .account the quantities of water actually available
3. .The time specified for stopping irrigation is (24) hours prior to that date
4. Failure to comply with this will result in blocking the water quota until it is committed to the association. Failure to comply with this will result in blocking the water quota until it is .committed to the association
5. Cooperating with the Board of Directors and reporting in advance any malfunctions, damages or . excesses in the irrigation facilities
6. .Refrain from tampering with irrigation installations
7. .Do not pollute the water intended for use
8. Failure to bring livestock to irrigated agricultural land, and non-compliance with the above .paragraphs will result in suspending his membership

:Article (10) Structure of the Board of Directors

Each association shall have a board of directors consisting of an odd number of members, provided that it does not exceed five members who are elected by the Each association shall have a board of directors consisting of an odd number of members, provided that it does not exceed five members who are elected by the general assembly of the association for a period of (3) years on a voluntary basis and do not receive . (any compensation for the services they provide . - Technical Member - Member Admin

:Article (11) Duties of the Board of Directors

:The Board of Directors of the Association undertakes the following tasks

1. Managing the affairs and electing a chairman of the board of directors and a president of the association from among its members or from others, and Managing the affairs and electing a chairman of the board of directors and a president of the association from among its members or .from others, and determines the work of the department to which it is concerned
2. The board of directors of the association shall allow the specialized employees, inspectors and auditors to review the progress of work in the The board of directors of the association shall allow the specialized employees, inspectors and auditors to review the progress of work in the .association, inspect and audit records and documents, and answer their inquiries
3. Providing the necessary competencies, skills and management methods to ensure that the interest of farmers is fully served and taking all reasonable Providing necessary competencies, skills and management methods to ensure that the interest of farmers is fully served and taking all reasonable measures to maintain the efficiency , safety and sustainability of the irrigation facilities placed at the disposal of the (Union) with the active The following is a list of the .members of the Union
4. The Board of Directors is committed to receiving technical support provided by the departments

of the Ministries of Water Resources and Agriculture to The Board Directors are committed to receiving technical support provided by the departments of the Ministries of Water Resources and Agriculture to use modern irrigation methods in order to rationalize water use and achieve .high use efficiency

5. The president of the association has the right, as a legal capacity, to file legal lawsuits with the courts against members who violate the rules of The president of the association has the right, as a legal capacity, to file legal lawsuits with the courts against members who violate the rules of procedure and to submit requests or reviews in the name of the association with state .departments

Article (12) Suspension of membership

The member of the association shall be subject to membership suspension procedures, which will result in withholding the water quota from him in one of the following cases: (1) The member of the association shall be subject to the membership suspension procedures, which will result in withholding the water quota from him in one of the following cases The member of the association shall be subject to membership suspension procedures, which will result in withholding the water quota from him in one of the following :cases

1. .His failure to fulfill his membership obligations mentioned in Article (9) above
2. .Allowing water to be delivered to other users who are not affiliated with the association
3. Using his water share for purposes other than those agreed upon without obtaining permission to .do so
4. . Exceeding the water quota prescribed for an association member

Article (13) A contract between the commission and the association

An agreement (contract) shall be concluded between the Users Association represented by the President of the Association and the Director General of the An agreement (contract) shall be concluded between the Users Association represented by the President of the Association and the Director General of the Authority for the operation and maintenance of specialized irrigation projects, which includes the :following

1. .Area and type of irrigation system to be jointly managed
2. .Authority responsibilities
3. .Responsibilities of water user associations

:Article (14) Loss of Membership

Without prejudice to the provisions of Article (9), a member loses his membership in one of the following :cases

1. Non-payment of the agreed-upon subscription fees for two consecutive seasons, but he can .recover them when he pays what he owes
2. .Loss of eligibility, and this results in the appointment of his successor
3. Death The rights and obligations of the deceased member are transferred to one of his heirs after .being duly authorized by the rest of the heirs

4. .Termination of the member's legal relationship with the usufructuary land for any reason

:Article (15) Suspending the work of the association's board of directors

The Minister, based on a request from the General Authority for the Operation and Maintenance of the Competent Irrigation Projects, may suspend the work The Minister, based on a request from the General Authority for the Operation and Maintenance of the Competent Irrigation Projects, may suspend the work of the association's board of directors when it fails to carry out its tasks and objectives and violates the conditions of establishment. The competent water resources directorate is responsible for supervising the use of water until a new association's board of directors is elected. The competent water resources directorate is responsible for supervising the use of water until a new association's board of directors is .elected

:Article (16) Preconditions for establishing new irrigation projects or rehabilitating old projects

When the Ministry plans to establish a project to build or rehabilitate irrigation facilities, it is required that the Water Users Association be present in the targeted area. In the absence of such, an association of .beneficiaries must be established

The Ministry encourages the active participation of the associations in the planning phase of building or rehabilitating irrigation facilities and The Ministry encourages the active participation of the associations in the planning phase of building or rehabilitating irrigation facilities and agrees with the association on the plans and responsibilities of operation, maintenance and management before starting work according to a joint record. The Ministry encourages the active participation of the associations in the planning phase of building or rehabilitating irrigation facilities and agreeing with the association on the plans and responsibilities of operation, maintenance and management before starting work according to a joint .record

:Article (17) Encouraging the establishment and operation of large associations (unions)

The Department of Water Resources must initiate the establishment and operation of a large-scale union that covers all or part of the irrigation projects The Department of Water Resources must initiate the .establishment and operation of a large-scale union that covers all or part of the irrigation projects

1. A large union must have a general body as a supreme body consisting of at least one representative .from each of the distribution channels in the target area
2. A large federation shall have a council body elected from among the representatives of the .distribution channels at the general assembly meeting
3. The number of representatives of distribution channels and members of the Board of Directors shall .be determined by its by-laws
4. The Ministry appoints an official in the Department of Water Resources as a manager for a large-scale association, and the director undertakes the The Ministry appoints an official in the Department of Water Resources as a manager for a large-scale association, and the director undertakes the operation of the association in consultation with the members of the Board of Directors based on the skills development plan of the Participatory The Ministry appoints an official in the Department of Water Resources as a manager for a large-scale association and the

director undertakes the operation of the association in consultation with the members of the Board of Directors based on the skills development plan of theParticipatory

5. In the large union, the representatives of the distribution channels and the beneficiaries are responsible for the operation, maintenance and In the large union, the representatives of the distribution channels and the beneficiaries are responsible for the operation, maintenance and management of the irrigation facilities in the distribution channel area, while the management of the higher irrigation facilities including the In the large union, the representatives of the distribution channels and the beneficiaries are responsible for the operation, maintenance and management of the irrigation facilities in the distribution channel area, while the management of the higher irrigation facilities including the transfer work to the distribution channels is done by .the association
6. Other matters related to the establishment and operation of large associations are subject to the provisions of these instructions and guidelines for the Other matters related establishment and operation of large associations are subject to the provisions of these instructions and guidelines for the large association, and it is a participatory management (operation and maintenance) and according to a joint agreement between the president of the Other matters related the establishment and operation of large associations are subject to the provisions of these instructions and guidelines for the large association, and it is a participatory management (operation and maintenance) and according to a joint agreement between the president of the union (the government employee) and the president of the association on each branch within the branches of .the project
7. The Ministry of Water Resources shall be the competent authority to supervise these (unions or gatherings). It shall be organized in a manner involving the beneficiaries, by approving the basic systems and their programs, and following them up by holding a It shall be organized in a manner involving the beneficiaries, by approving the basic systems and their programs, and following them up by holding a meeting of temporary representatives of all distribution channels for all or .part of them to assist in the establishment of a large-scale federation, as The case may be

Article (18) Government support and supervision

The General Authority for the operation of the specialized irrigation and drainage projects and the competent Water Resources Directorate undertake The General Authority for the operation of the specialized irrigation and drainage projects and the competent Water Resources Directorate undertake management, participation, follow-up and provide technical support on the work of the association and the .federation and assist it in carrying out its tasks and objectives

Article (19) Promoting and Strengthening the Instructions

.These regulations implemented from the date of publication in the Official Gazette

Article (20): Repeal of the previous instructions

.Instructions No. (1) of 2014 are repealed and any text that contradicts these instructions is not valid