



EMPLOYMENT INTENSIVE INVESTMENT PROGRAM

WATER CISTERNS IMPACT ASSESSMENT ANALYSIS REPORT



Job creation for Syrian Refugees and Jordanian host
communities through Green Works in agriculture and forestry

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Executive Summary:

Rainwater harvesting cisterns are considered one of the most important rainwater harvesting interventions in the agriculture sector, especially in areas of low precipitation. They serve as the main source of supplementary irrigation for trees during the hot summer seasons and are thus a critical piece of infrastructure to control for seasonal variation in temperature and perception. The ILO, together with the Ministry of Agriculture, utilized labour intensive methods to improve agricultural infrastructure and contribute to better conditions in communities hosting large numbers of refugees. The current study demonstrated the direct and indirect impact of interventions on farm-level income and productivity.

- 72% of farmers increased the cultivated area in their farms after constructing the cisterns;
- 70% of farmers increased the number of plant varieties after cistern construction;
- 50% of the farmers added new technologies to their farms after cistern construction (Irrigation system, greenhouses);
- 51% of farmers saved more than 30% in irrigation costs after cistern construction;
- 70% of farmers had increased their yield per Dunum after the construction of the cisterns;
- 69% of farmers had an increase in their income after cistern construction.

Background

The agriculture sector in Jordan is an important source of income and subsistence, particularly for poorer segments of society, including migrant workers, refugees and vulnerable Jordanians. The Government estimates that 25% of poor households rely on the sector for income.¹ According to Ministry of Labour Statistics, the sector is the second largest employer of non-Jordanian workers, including a large number of Syrian workers. In the context of the Jordan Compact, which makes concessional trade and finance contingent on Jordan delivering work permits to Syrian refugees, the sector's importance has only grown.

While the investments and expanded trade opportunities envisioned under the Jordan Compact will create jobs in the long term, it is of crucial importance to facilitate immediate decent work opportunities for Syrian refugees and vulnerable Jordanians. To this end, the ILO implemented Employment Intensive Investment Projects that link decent work with asset creation and maintenance in communities that are particularly impacted by the displacement crisis.

With support from the Kingdom of Norway, the project "Job creation for Syrian refugees and Jordanian host communities through green works in agriculture and forestry" was implemented starting in January 2017. A second phase followed in January 2018. The project aimed to improve living conditions for Jordanians host communities and Syrian refugees through increased decent work opportunities and improved infrastructure in the agriculture sector.

¹ <http://inform.gov.jo/en-us/By-Date/Report-Details/ArticleId/63/smid/420/ArticleCategory/216/Assessment-of-the-Agricultural-Sector-in-Jordan>

Introduction

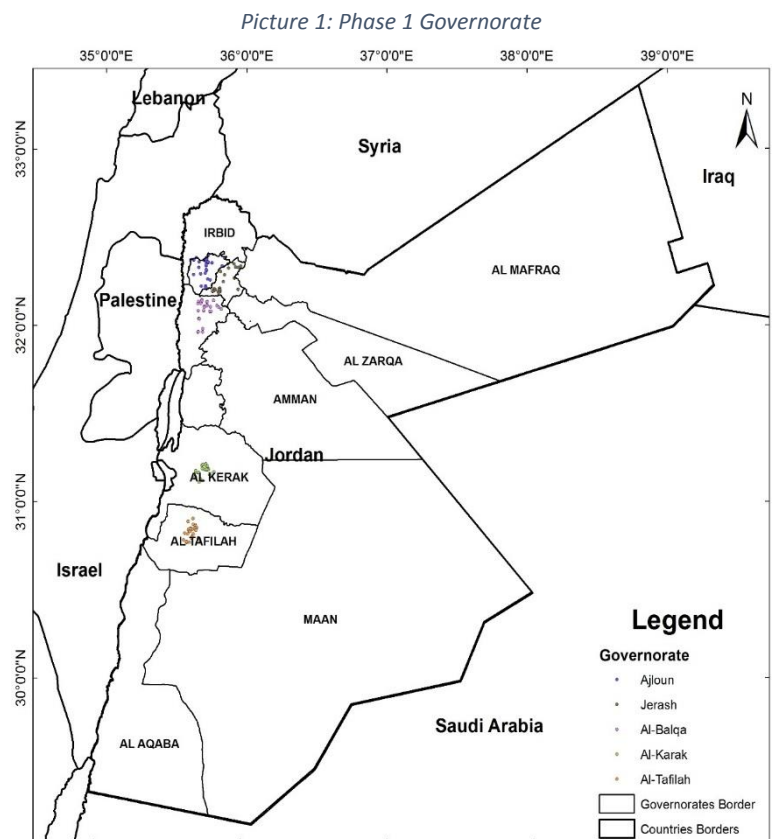
The ILO, together with the Ministry of Agriculture, is implementing activities, which are helping Jordanians and Syrian refugees's access decent work in the sector of agriculture and forestry, using employment-intensive methods.

The second phase of the project built on the successes of the first phase, which was completed in July, 2018. In its first phase, the project supported 1,199 Syrian refugees and Jordanian workers to access short-term employment in infrastructure projects. The second phase benefited 1,000 Syrian and Jordanian men and women, including persons with disabilities

In the initial phase, activities focused on five governorates. The second phase of the project extended activities to eight governorates, including Ajloun, Jarash, Al Balqaa, Al Karak, Al Tafila, Madaba, Al Zarqa, and Ma'an, which host a significant number of Syrian refugees.

The ultimate objective of the project was to promote better living conditions for Syrian refugees and Jordanians through increased decent work in the agricultural sector and an improved environment:

- Support 1,000 Syrian women and men refugees and Jordanians men and women (with total of 45,000 working days) access short-term employment;
- Improve infrastructure and environmental works through the use of employment intensive methods in agriculture, forestry, and nurseries sector.



The project has the immediate objective to improve agricultural infrastructure through the use of employment intensive methods. Among other activities, it targetted 143 water cisterns which were constructed inside 143 farms during the first phase. Another 120 water cisterns were constructed in the second phase of the project, along with implementation of 1000 Dunums (Dunum=1000 square meters) of forestry works across nine sites (Jerash, Ajloun, Al-Balqa, Karak, Tafilah, Zarqa, Madaba, Ma'an, and Al-Shobak) and seedling production at three sites (Tafilah, Al-Balqa, and Jerash).

Objectives

The objective of the study is to assess the utilization of the implemented rainwater harvesting cisterns and their impact on farm-level production and the livelihoods of the beneficiaries.

Rainwater harvesting cisterns are considered one of the most important rainwater harvesting interventions, especially in areas of low precipitation. They serve as the main source of supplementary irrigation for trees during the hot summer seasons. They are especially critical as a source of reliable irrigation during the first two years after seedlings are planted.

Targeted Farms and sample of study:

The study targeted 143 farms where water cisterns were constructed in five governorates (Ajloun, Jerash, Balqa, Karak, and Tafilah) under the ILO project.

The data was collected by ILO Field Officers, through field visits to the targeted farms. Field Officers met with the farmers, using GPS locations, and collected questionnaires².

Surveyed farms were divided between two regions: Those in the north (Jerash, Ajloun, Al-Balqa) and those in the South (Al-Karak, Al-Tafilah). Questions were divided into two categories:

- 1) Information about the construction of water cisterns;
- 2) Information about use of harvested rainwater and the impact on farm production.

A comparison between the northern and southern governorates was made to isolate the impact of variations in rainfall and other environmental factors.

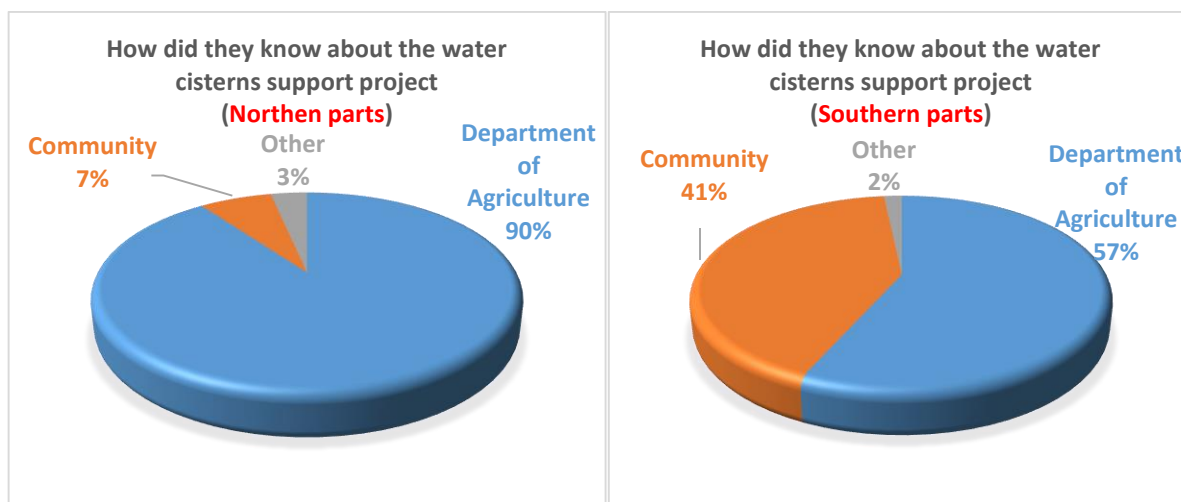
² See Annex 1

Results

1. Information about the construction of water cisterns

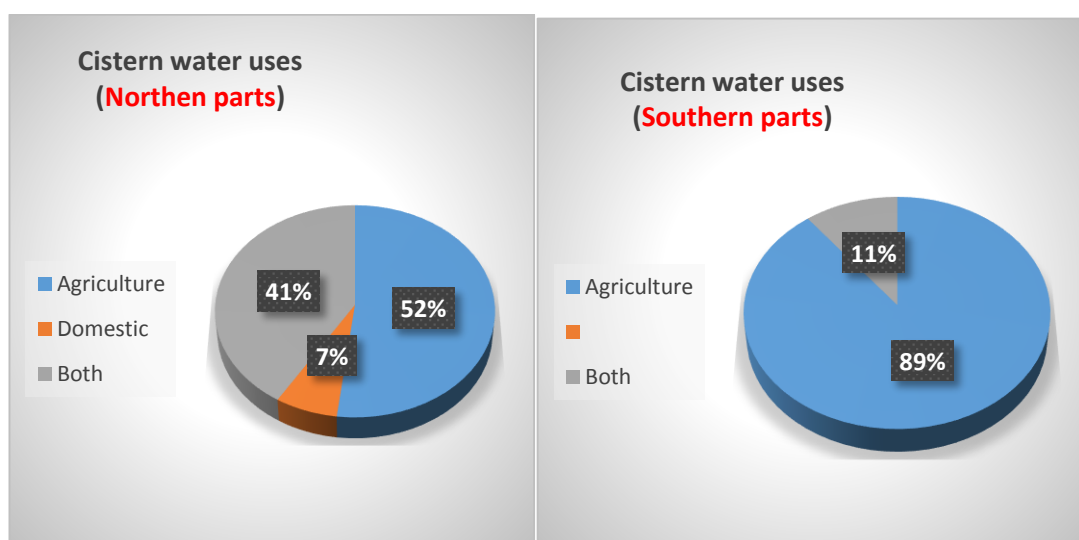
- 77% of the farmers found out about the project through the Department of Agriculture, while the others knew from their relatives or through the community.

Figure 1 Knowing About Water Cisterns Support Project



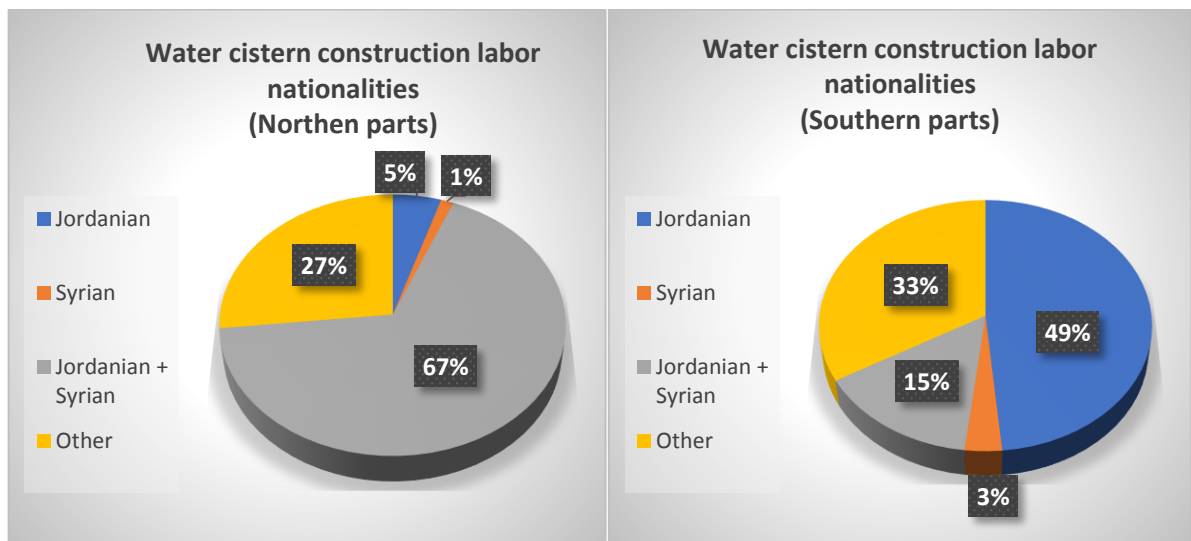
- 63% of farmers had a cultivated area more than two Dunums (one Dunum= 1000 square meters) before the water cistern was constructed, while 37 % had less than two Dunums.
- 67% of the farmers were using the water cistern directly for agricultural purposes, while 4% of them reportedly used them for only domestic purposes and 29% for both purposes.

Figure 2 Cistern Water Uses



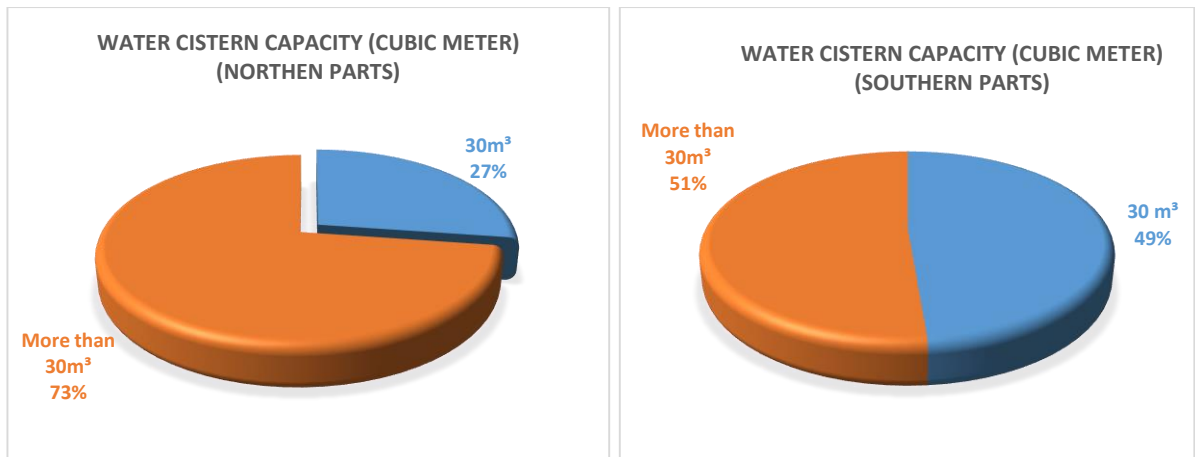
- 92% of the farmers reported that the costs of water cistern construction was higher than the project's contribution (1200 JOD).
- 72% of the farmers hired contractors to construct the cistern, while 5% of the farmers themselves constructed the cisterns (without contractor), and 23% used both ways (themselves and a contractor).
- The project design gave the farmers two design choices for the construction of cisterns. The first was a traditional pear shaped cisterns, which is typically dug underground and suitable for rocky lands. The second design, was above ground and constructed by using reinforced concrete and suits sandy soil. The latter option was more expensive. 53% of the water cisterns were constructed as traditional underground cisterns (pear shaped), while 47% were constructed above ground as concrete cisterns.
- In the north, where a significant number of Syrian refugees are residing, the farmers employed more Syrians to construct the cisterns, while in the south less Syrians refugees were employed to construct the cisterns

Figure 3 Water cistern construction labor nationalities



- 72% of the cisterns took 20 working days or more, while 27% of them took a total of 10-20 working days, and 1% less than 10 days.
- 64% of cisterns had a total capacity of more than 30 cubic meters, while 36% of constructed water cisterns had a 30 cubic meter capacity (minimum required).

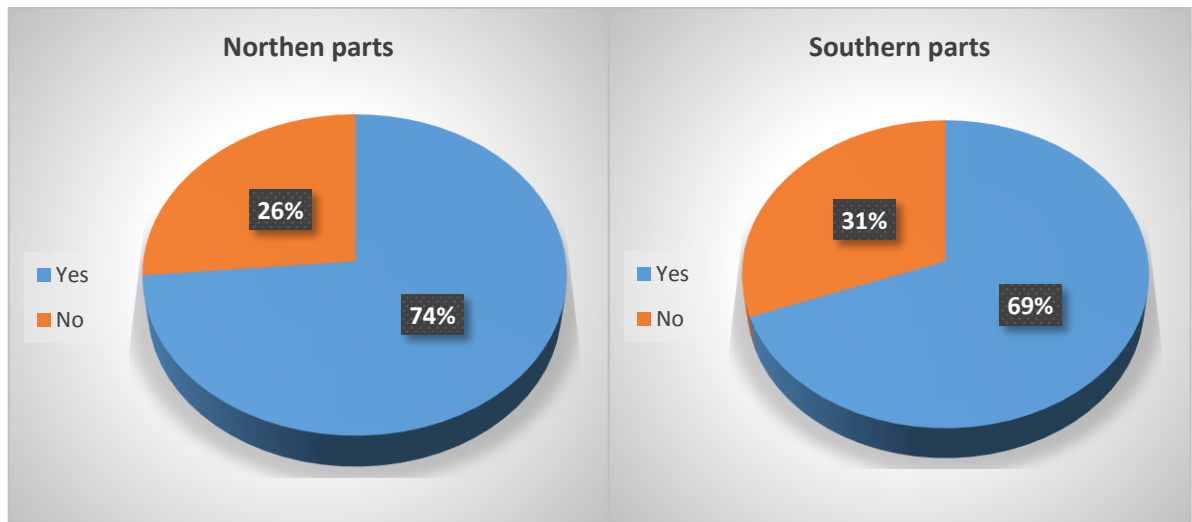
Figure 4 Water Cistern Capacity



2. Information about rainwater harvesting and farm production

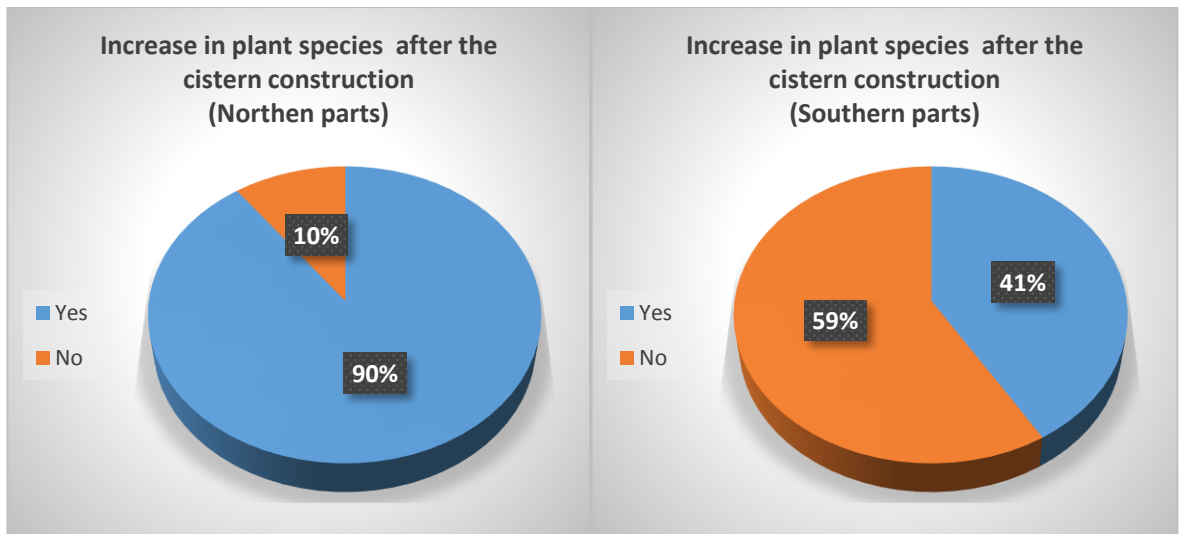
- 34% of farmers estimated that the water demands per Dunums was about 20-30 cubic meters, while 33% of them said that the water demands were only 10-20 cubic meters, 11% of them thought that the water demands were more than 30 cubic meters, and 22% thought the water demand was less than 10 cubic meters.
- 72% of farmers increased the cultivated area in their farms after constructing the cistern, while the 28% did not.

Figure 5 increasing in Cultivation Area



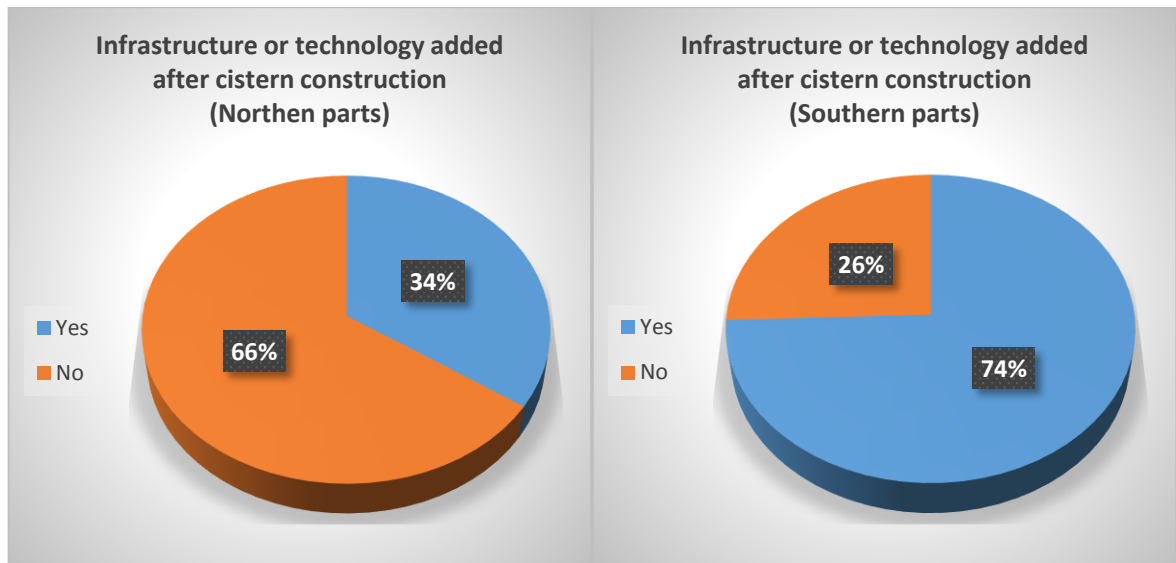
- 70% of farmers increased the number of plant varieties after cistern constructing, while 30% of them kept the same varieties.

Figure 6 increasing in plant Species



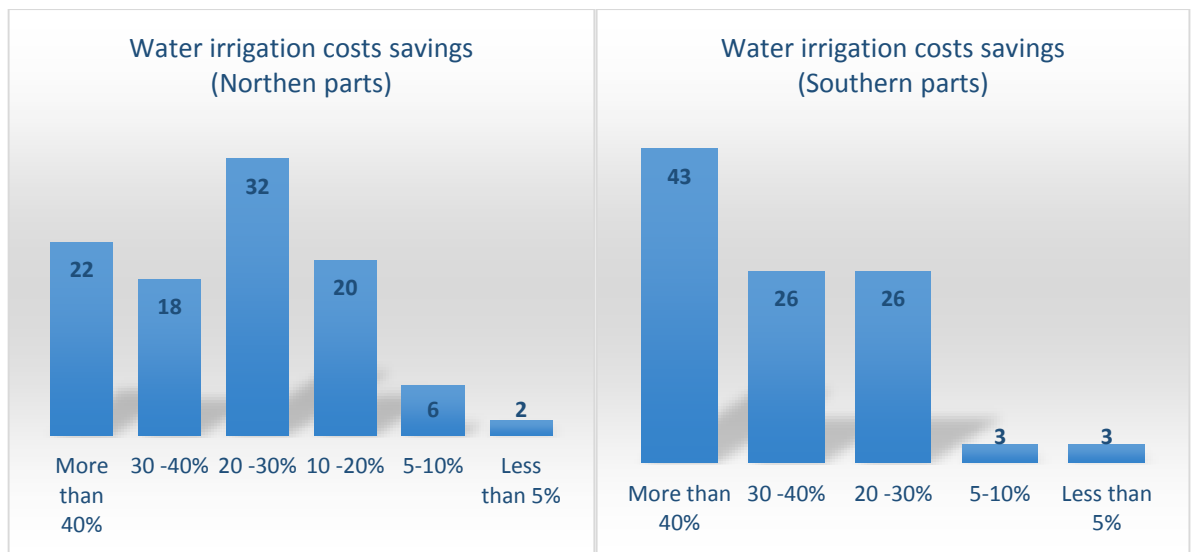
- 50% of the farmers added new technologies to their farms after cistern construction (Irrigation system, greenhouses).

Figure 7 Infrastructure or technology added after cistern construction



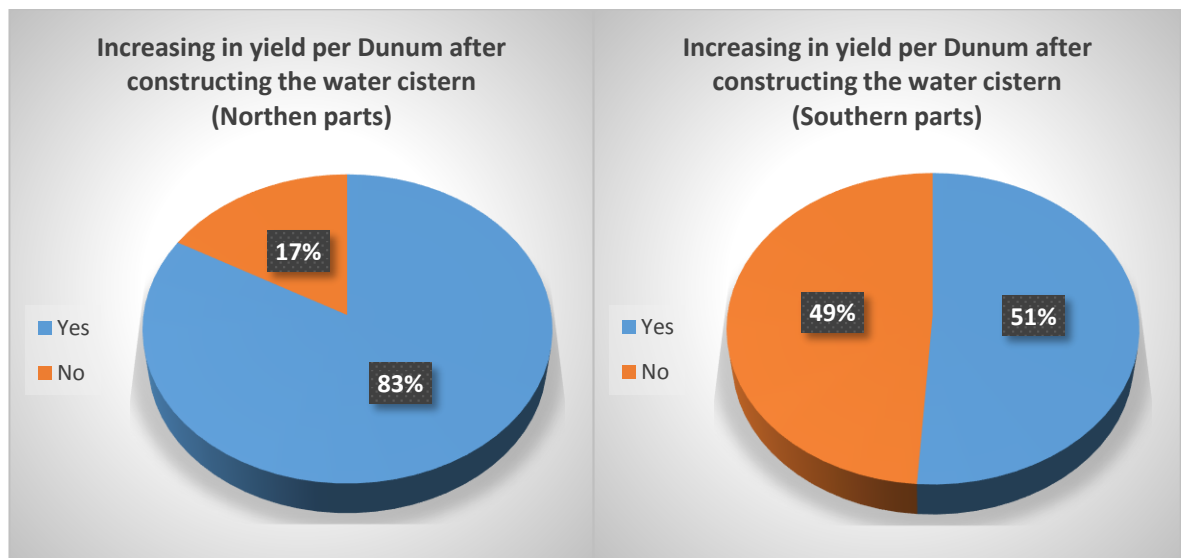
- 93% of the water cistern had collected rainwater during the last raining season, while 7% of them had not.
- Only 17% of the farmers said that the water collected in their cisterns during the last season was enough to meet the farm's water needs entirely.
- 78% of farmers used another water source (paid water, tap water) to fill their cisterns, while 22% did not use.
- 30% of the farmers saved more than 40% of the irrigation water costs after cistern construction, while 21% saved about 30-40%.

Figure 8 Water Irrigation cost saving



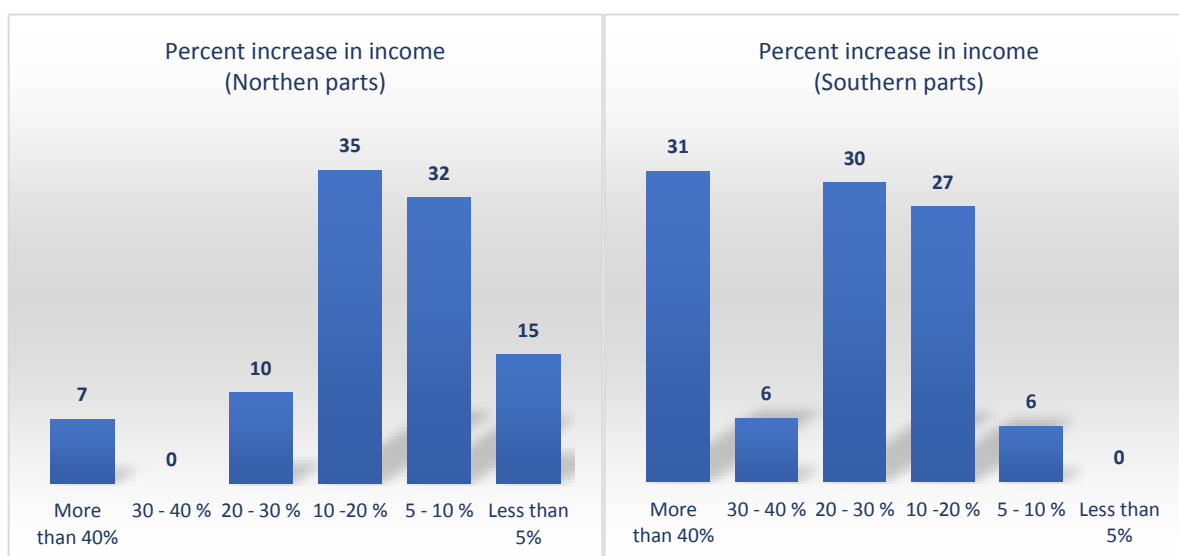
- 70% of farmers had increased their yield per Dunum after the constructing of the cisterns, 30% of them had not.

Figure 9 Increasing in Yield per Dunum



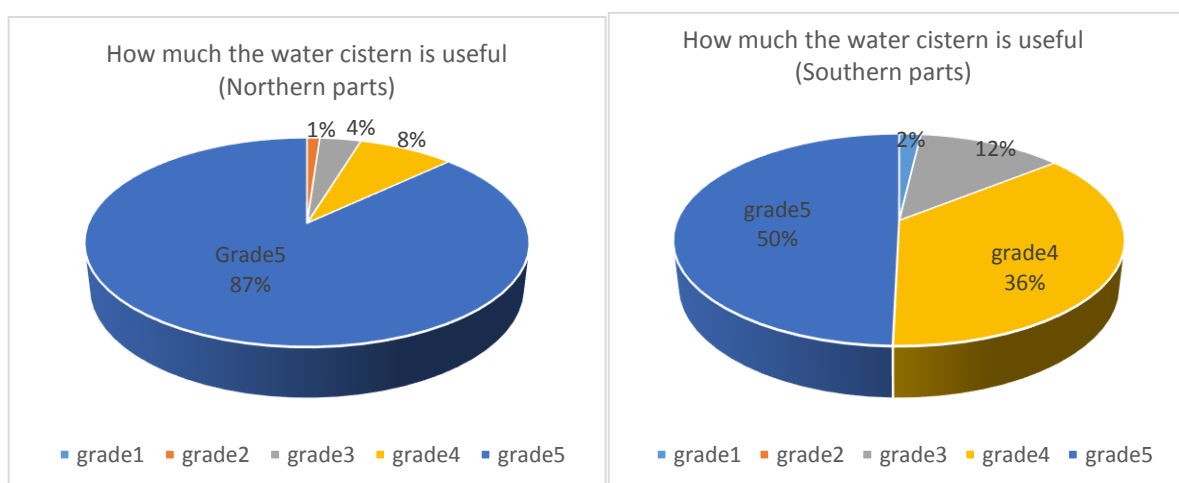
- 69% of farmers had an increase their income after cistern construction, while 31% of them did not report any change.
 - The income from agriculture production increased after the cistern construction as follows:
 - 32% of the farmers reported income increases of 10-20%, while 22% had an increase in the total income by 5-10%. Only 18% of them had an increase between 20-30% and 17% of them increased their income more than 40%. The rest (9%) had less than a 5% increase in the total income from agriculture production.

Figure 10 Increase in total income



- After cistern construction, 65% of the farmers employed workers in their farms (including family members), while 35% of them did not. The largest nationality of the employed workers was Jordanian (81%), followed by 8% Syrians and 11% other nationalities.
- On a scale from 1 to 5 (5 being the highest), 72% of the farmers evaluate the water cistern grade as 5.

Figure 11 Usefulness of Water cistern



- 99% of the farmers would advised that other farmers and their relatives apply these water cisterns inside their farms.

Discussion and Recommendations

- **Support farmers to maintain the systems and effectively use combinations of technologies to meet their water needs.**

Most of the farmers (83%) indicated that the water harvested was not sufficient to last for one season and 75% of them used tap water or paid water to compensate the shortage.

- **Align future construction of cisterns with the anticipated rainy seasons.**

Some cisterns were constructed too late to collect water from the first month of the rainy season.

- **Initiate dialogue with farmers to identify practices that contribute to greater savings and income.**

Such increases should be Independent of environmental variables. Particularly focus on the 30% of farmers that saved up to 40%.

- **Support farmers to diversify their plant varieties, through training and information sessions done in tandem with water cistern construction.**

Most of the farmers (90%) in the north added more plant varieties to their farms after the cistern construction, in comparison less than half of the farmers in the south did the same, while most of farmers in the south (74%) added infrastructure or new technology inside their farms compared to only 34% in the north

- **Ensure long-term monitoring to capture the use of cisterns when trees are at their most productive (in 4-5 years).**

70% the farmers have increase in the yield per Dunum after cisterns construction. The increase in the yield in the northern governorates was significantly higher than the south, noting that some of the farmers starting to grow trees inside the farms after the water cisterns was constructed

- **Increase outreach to target populations through media, especially social media.**

Most farmers heard about the project through local Department of Agriculture.

- **Continue monitoring water cistern usage to ensure they are used for agricultural purposes.**

The project established effective lines of communication between the ILO and the implementing partner, and the farmers.

Annexes

(1) Questionnaire format

Farmer Name :

Address:

Phone

GPS location

- 1 Do you have a water cistern in you farm ☐ Yes ☐ NO
- 2 How did you know about the water cisterns support project ☐ Department of agriculture ☐ Community (relative, friend,.....) ☐ Other
- 3 Do you know who is the donor of this project? ☐ Yes, mention it..... ☐ NO
- 4 How many Dunums were cultivated before the cistern was installed? ☐ Less than 2 ☐ More than 2
- 5 Out of 5 how much do you see the water cistern is useful (5 is the highest) ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
- 6 For what purposes you use the water from the cistern(you can choose more than one answer) ☐ Agriculture ☐ Domestic ☐ Both ☐ Others, specify.....
- 7 What was the exact cost of cistern construction:..... JOD
- 8 How did you construct the cistern? ☐ Contractor ☐ Yourself ☐ Both ☐ Other:.....
- 9 What type of cisterns did you construct ☐ Underground (pear shaped) ☐ Above ground Collection reservoir (concrete)
- 10 Did you use labourers for cistern construction (including family members) ☐ Yes ☐ NO ☐ don't know

11 if your answer yes, please specify

Nationality	NO.	Male	female	If relative specify
Jordanian				
Syrian				
Other				

12 How many working days did it take to construct?

13 What is the capacity of the cistern (cubic meters) ☐ less than 30 ☐ 30 ☐ more than 30

14 How many cubic meters of water do you need per Dunum ☐ 1-10 ☐ 10-20 ☐ 20-30 ☐ more than 30

15 Did you increase the grown area after the cistern construction ☐ Yes ☐ NO
If yes, how many more Dunums were cultivated:.....Dunums

16 Did you grow more plant varieties after the cistern construction ☐ Yes ☐ NO
If yes please specify ☐ Fruit trees ☐ Vegetables

17 Did you add any infrastructure or technology to your farm after cistern construction ☐ Yes ☐ NO
If yes please specify ☐ irrigation system ☐ greenhouse ☐ Other.....

18 Did the cistern collected rainwater during winter? ☐ Yes ☐ NO
If Yes please specify the quantity of water ☐ Full ☐ Half ☐ Full, more than one time

19 Was the water stored in the cisterns sufficient to last for one season? ☐ Yes ☐ NO
If answer NO, please specify the % of the period the water covered out of the total season period%

20 Do you use another water resources to fill the cisterns (tap water, paid water)? ☐ Yes ☐ NO

21 After the water cistern constructed, did you save all or some of irrigation water costs? ☐ Yes ☐ NO
If yes, please specify how much %? ☐ Less than 5% ☐ %10-5 ☐ %20-10
☐ %30-20 ☐ %40-30 ☐ More than 40%

22 Did the yield per Dunum increase after constructing the water cistern? ☐ Yes ☐ NO

23 Did the income from agriculture production increase after the water cistern construction? ☐ Yes ☐ NO

☐ Less than 5% ☐ %10 - %5

If yes, please specify increase %? ☐ %20 - %10 ☐ %30 - %20

☐ %40 - %30 ☐ More than 40%

24 Did you use more labour in your farm after the cistern construction? (including relatives, wife, children, brother) ☐ Yes ☐ NO

If yes, please specify in the table below

Nationality	Number	male	female	Relative relation	Duration of employment
Jordanian					
Syrian					
Other					

25 Did you advise relatives, neighbours to apply such project in their farms? ☐ Yes ☐ NO

Do you have any suggestions or recommendations for expansion of this program?

.....

.....

.....

.....

ILO consultant comments:

.....

.....

Name:

Signature

Date: