

Adaptation to Climate Change with Improved Irrigation Water Management: a Case of Jordan Valley

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Problem Statement

- Water scarcity
- Increased pressure on the fragile water resources for many reasons (such as population growth, economic development, unstable political situation)
- Climate change
- Vulnerability of agriculture sector

Climatic change in Jordan

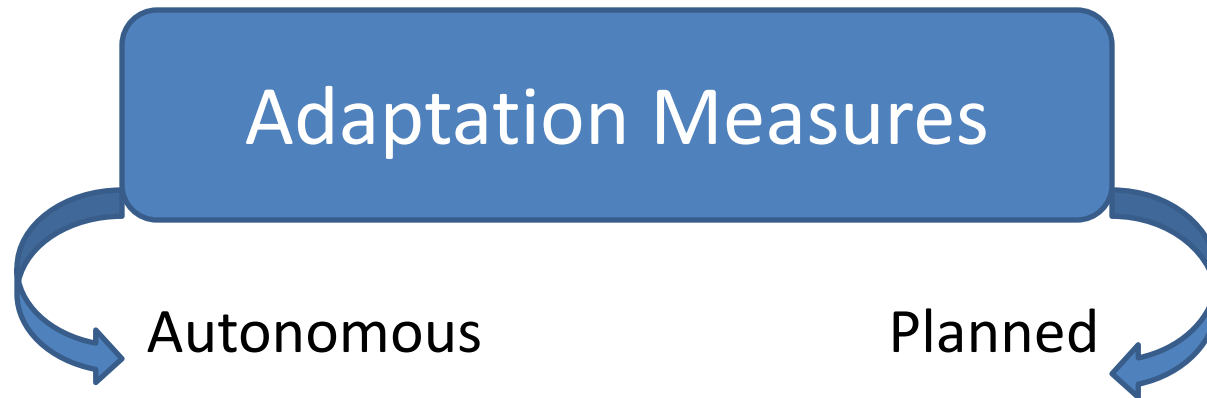
- Limited studies were carried out regarding climate change
- Increasing frequency of the extreme weather events.
- Studies predicted that the temperature will increase and the precipitation will decrease.

Objectives

- ➔ Identify the applicable adaptation measures that could be used by the local farmers in the Middle of Jordan Valley at the farm level and the policy level .
- ➔ Reviewing all possible and applicable adaptation measures worldwide;
- ➔ Screening and evaluating the most applicable and best adaptation measures that suitable in Middle Jordan Valley;
- ➔ Examining barriers and opportunities to adaptation to climate change risks; and
Investigating the economic impact of using conventional versus modern irrigation practices at the farm level;

Adaptation Measures

- Definition and Significance



- IWRM as a Tool for Climate Change Adaptation
- Barriers and Opportunities

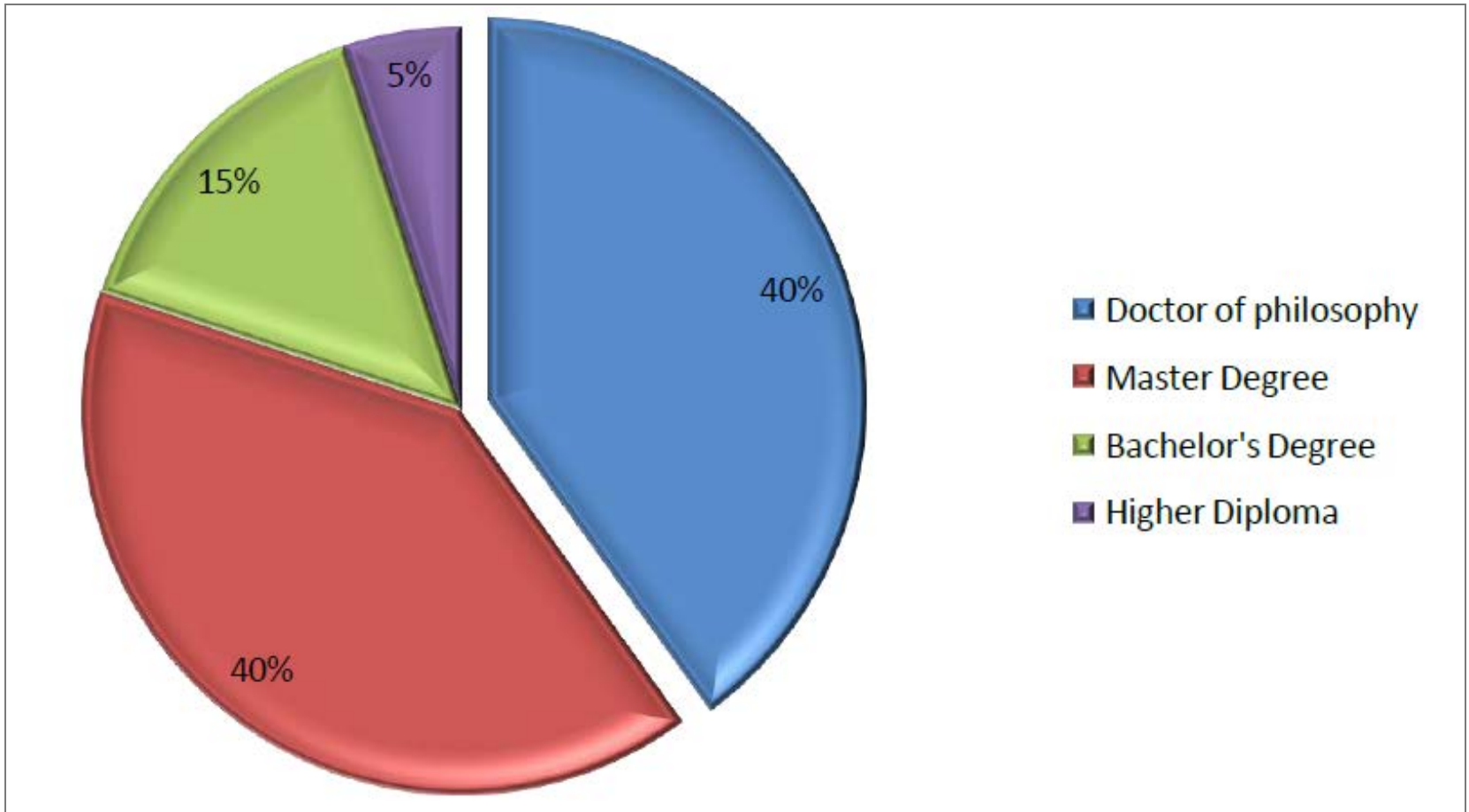
Adaptation Measures

- Stakeholder involvement in adaptation processes
 - Quantitative versus qualitative analysis
- Adaptation measures proposed and practice worldwide:
 - International level
 - Regional level
 - Local level

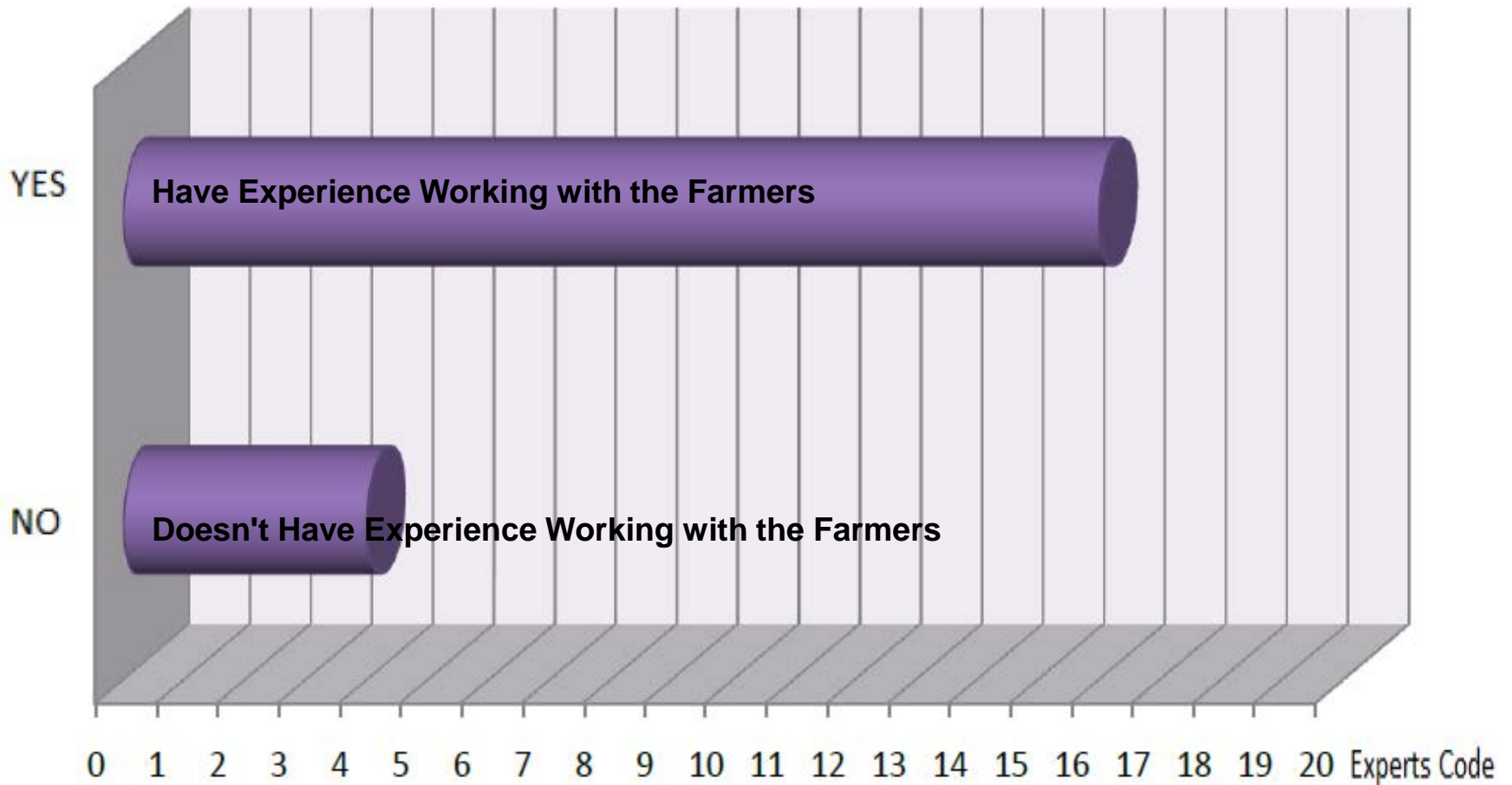
Methodology

- Data collection
- Screening of the adaptation measures worldwide
- Interviews with experts and farmers
- Qualitative data analysis using NVivo computer program
- Gross Margin calculation by using "vegtool"

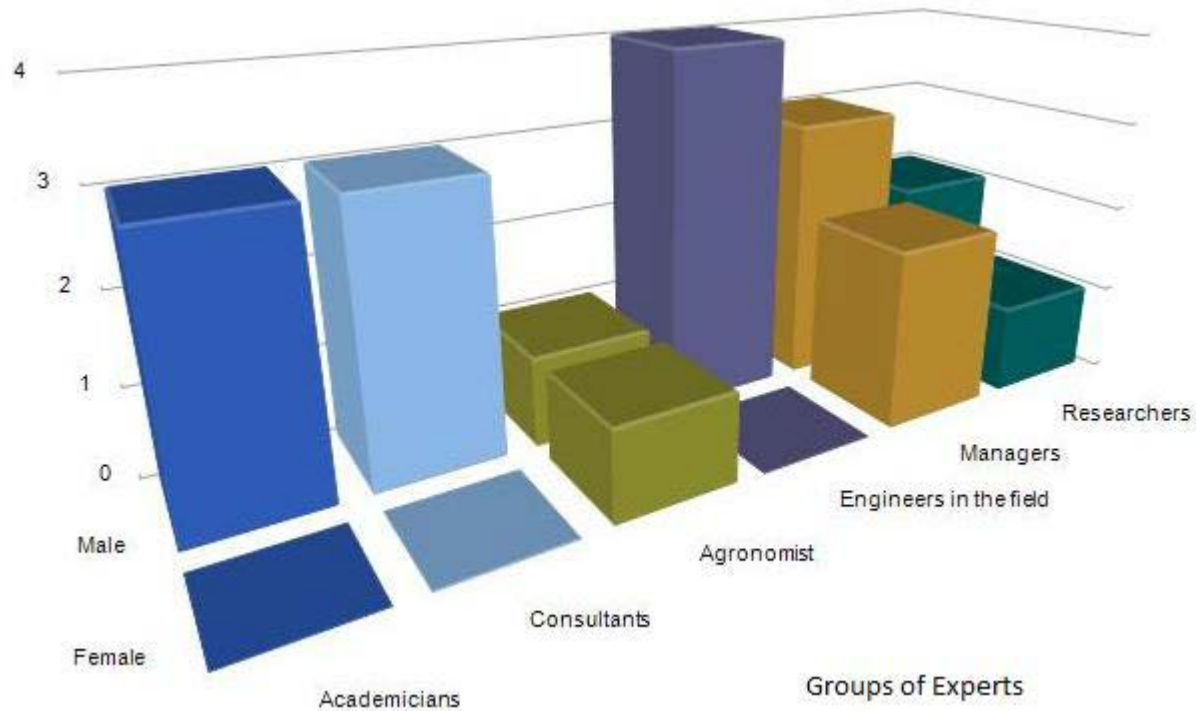
Experts Identification



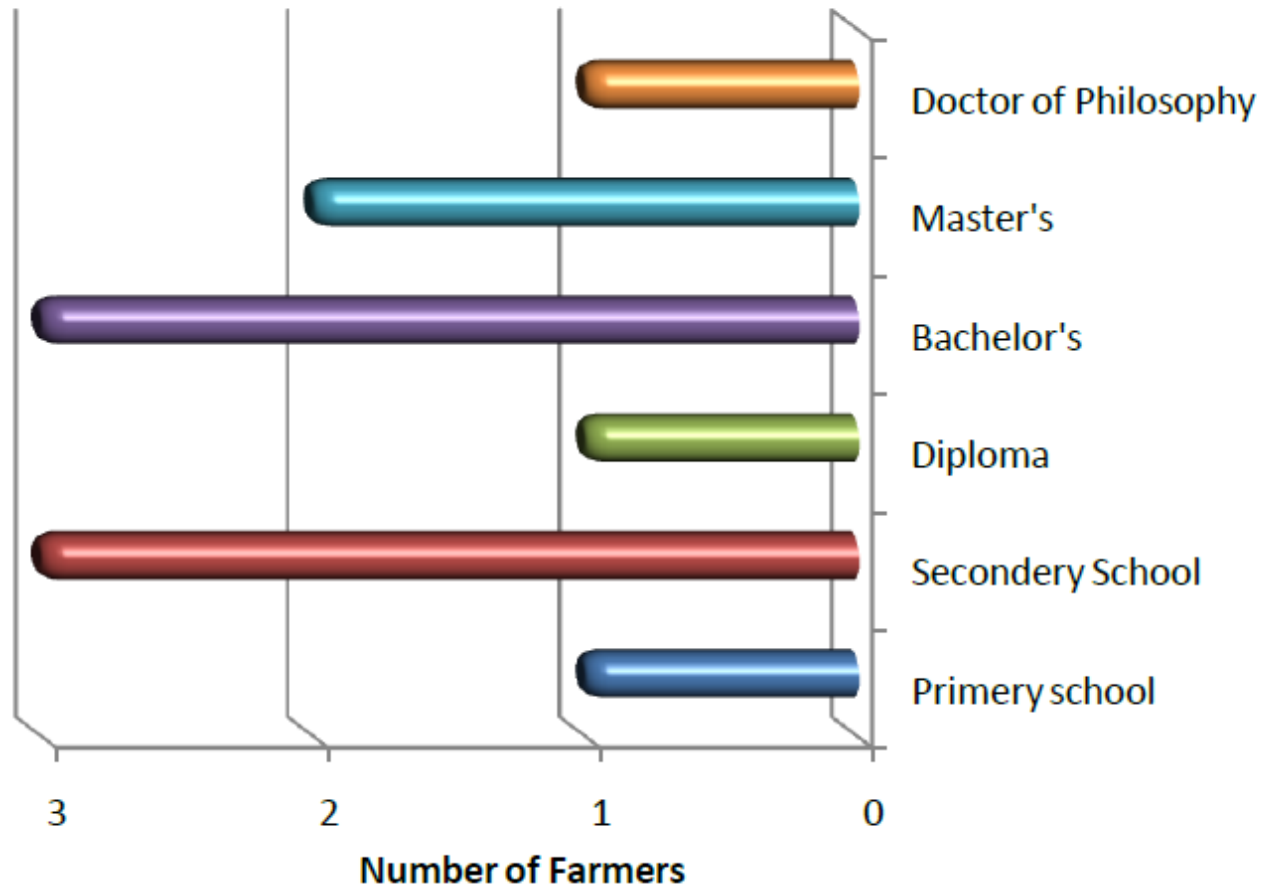
Experts Identification



Experts Identification



Farmers Identification



Farmers Identification

Number of interviewed farmers

11

Parameter

Characteristics

Main occupation

4 Agriculture
1 Agriculture (retired)
2 Government employees +
agriculture
2 Agriculture + business

Farm size

4 1-10 ha
4 10-20 ha
1 20-30 ha
2 90-100 ha

Most Cultivated Crops

8 Mixed farms (vegetables)
2 Citrus trees and vegetables
1 Fruits and vegetables

Irrigation System

9 Drip irrigation
2 Furrow irrigation

Interviews' Analysis

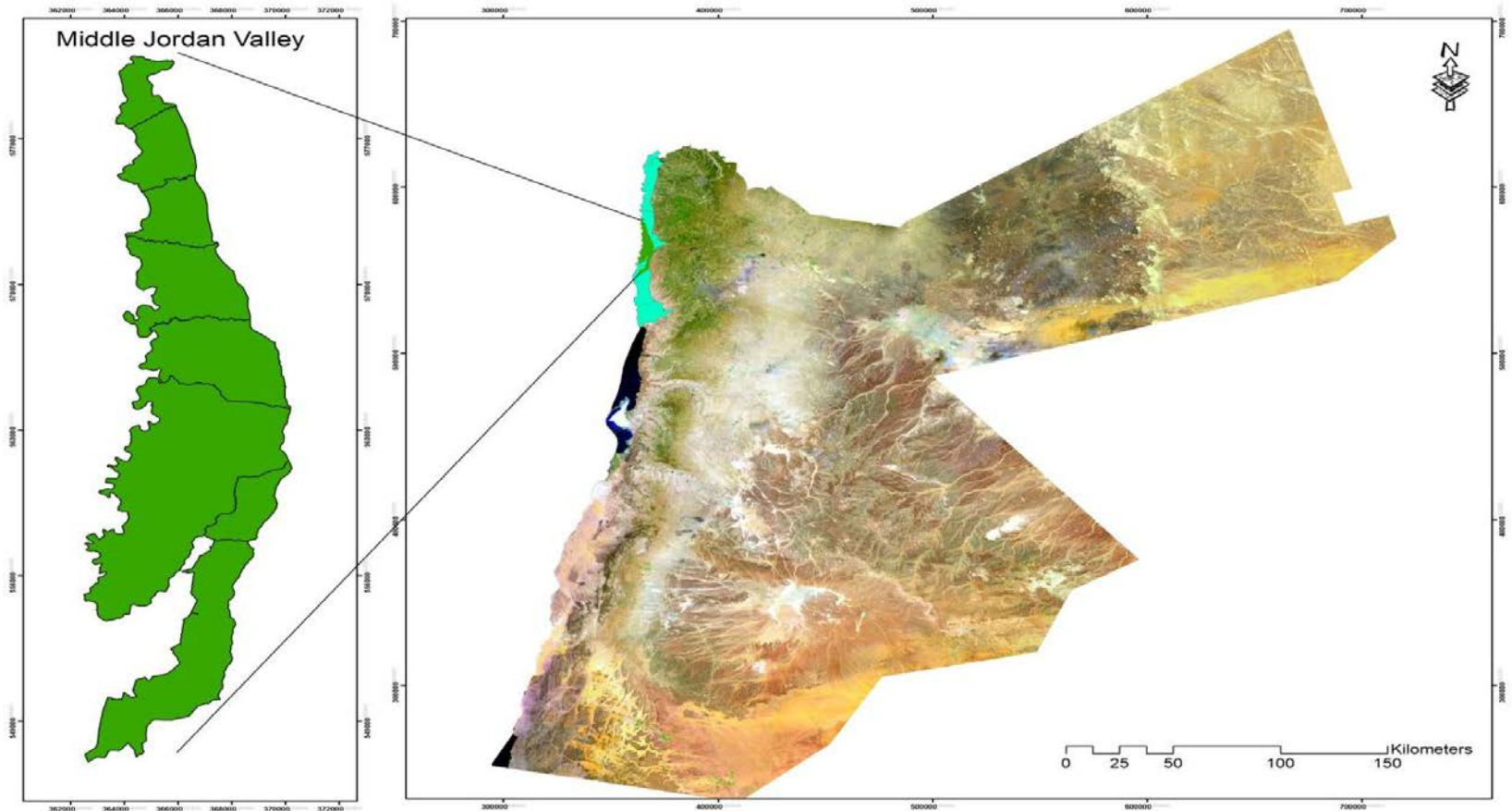
- NVivo computer Program

Qualitative Software analysis used to analyze the data qualitatively.

- “Vegtool” computer tool

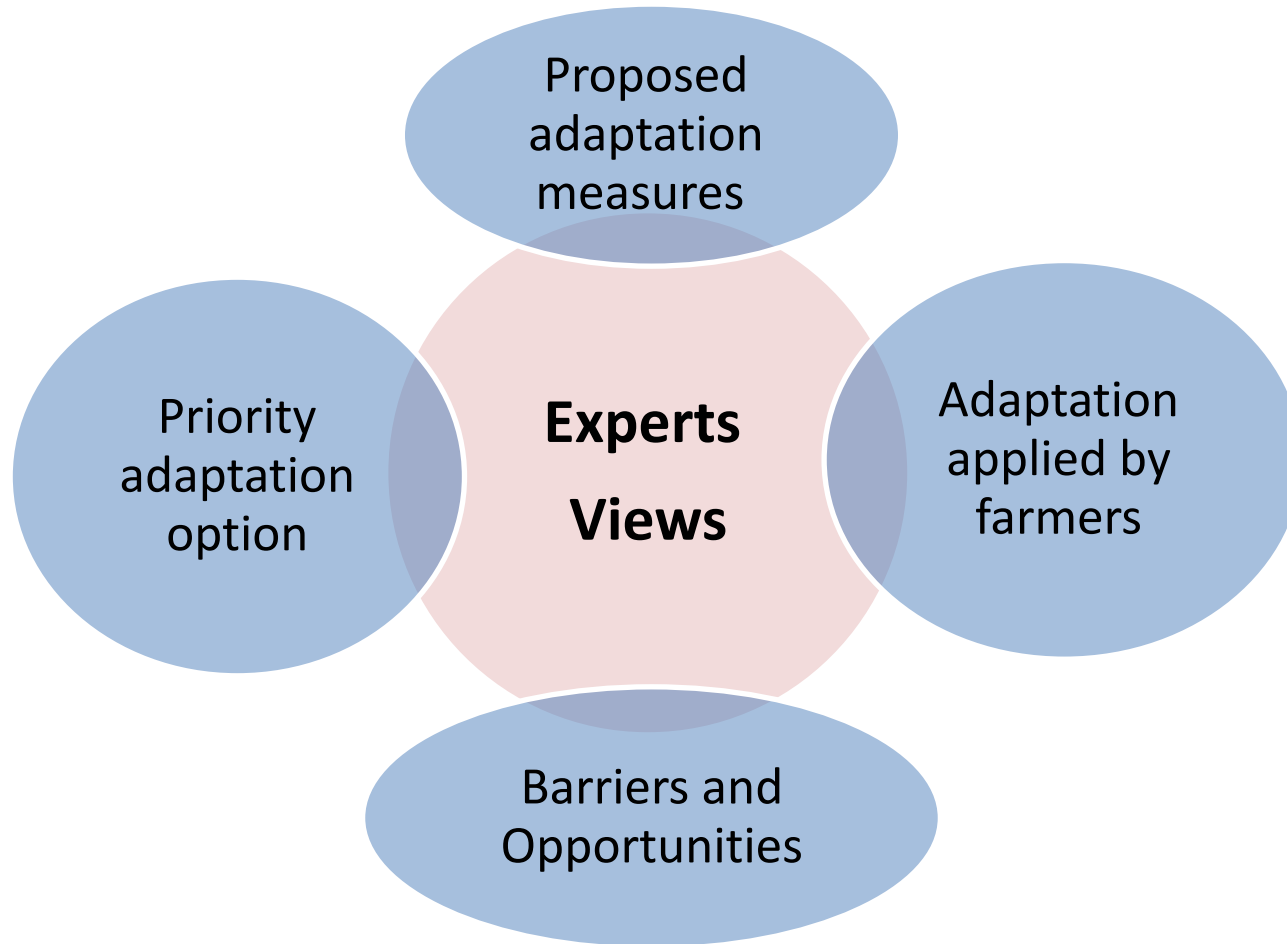
Tool used to organize data for the Gross Margin Benefit calculation.

Study Area

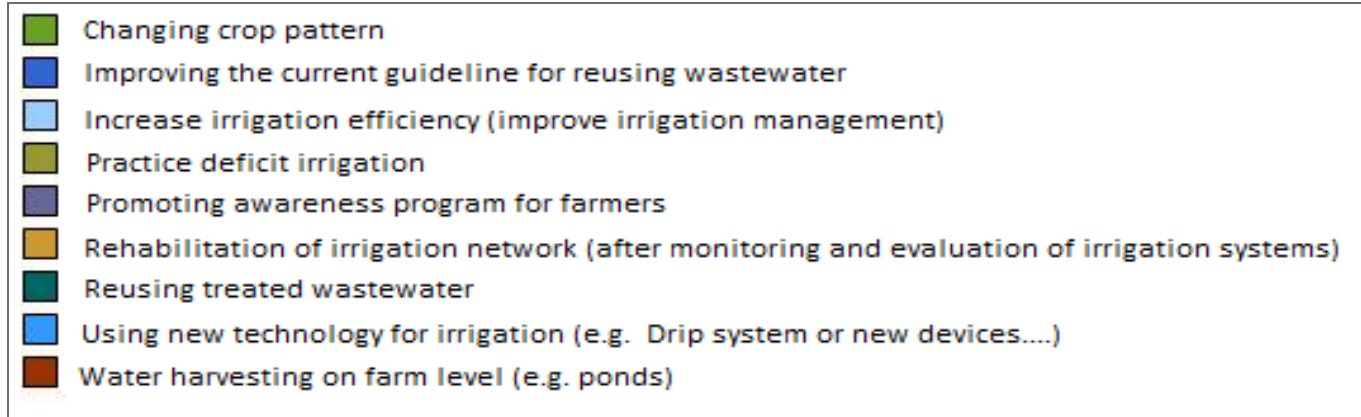
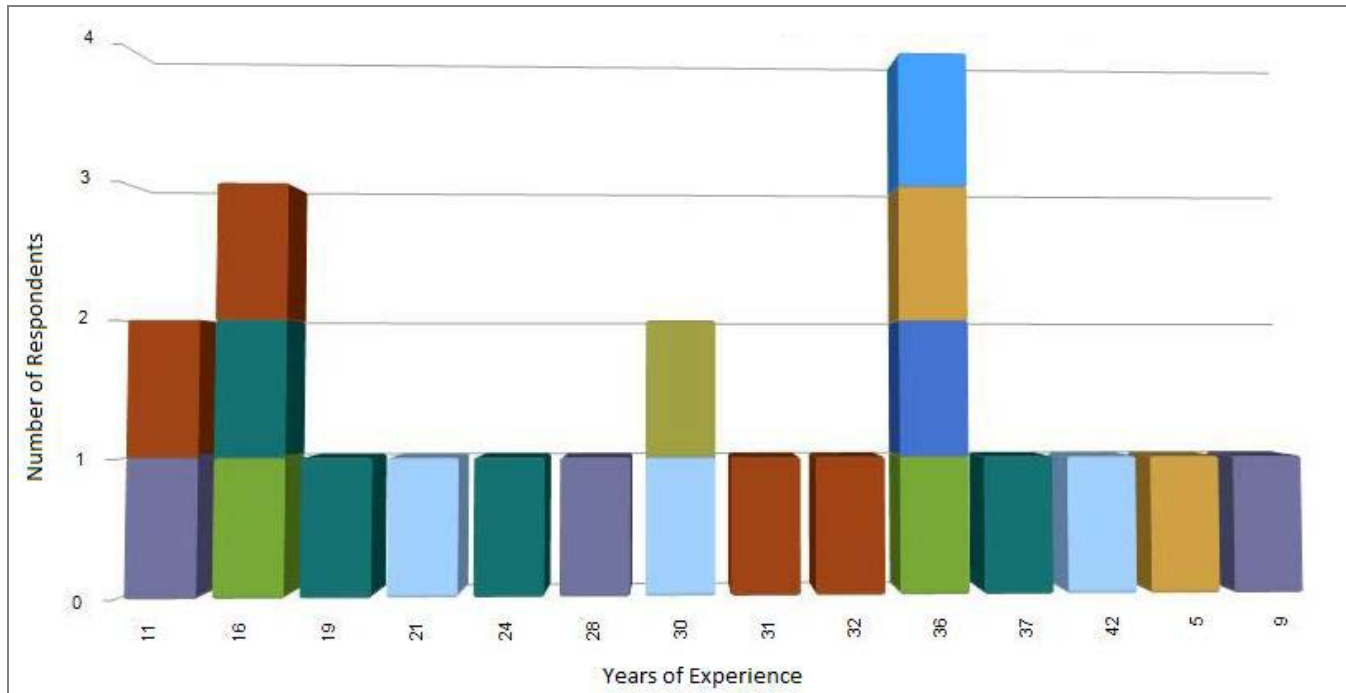


Middle Jordan Valley ,Source: (MWI, 2010)

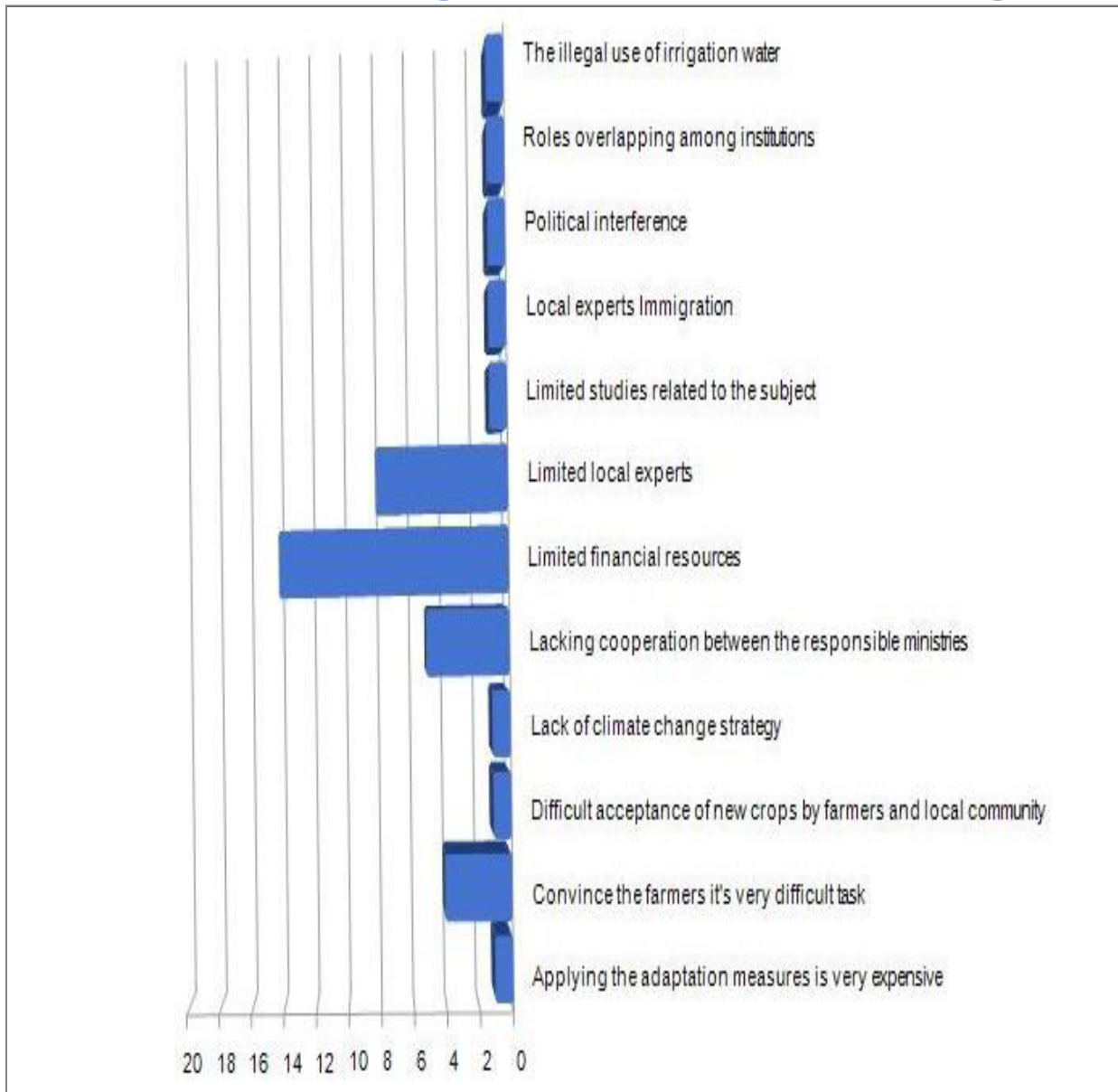
Results: Experts Views



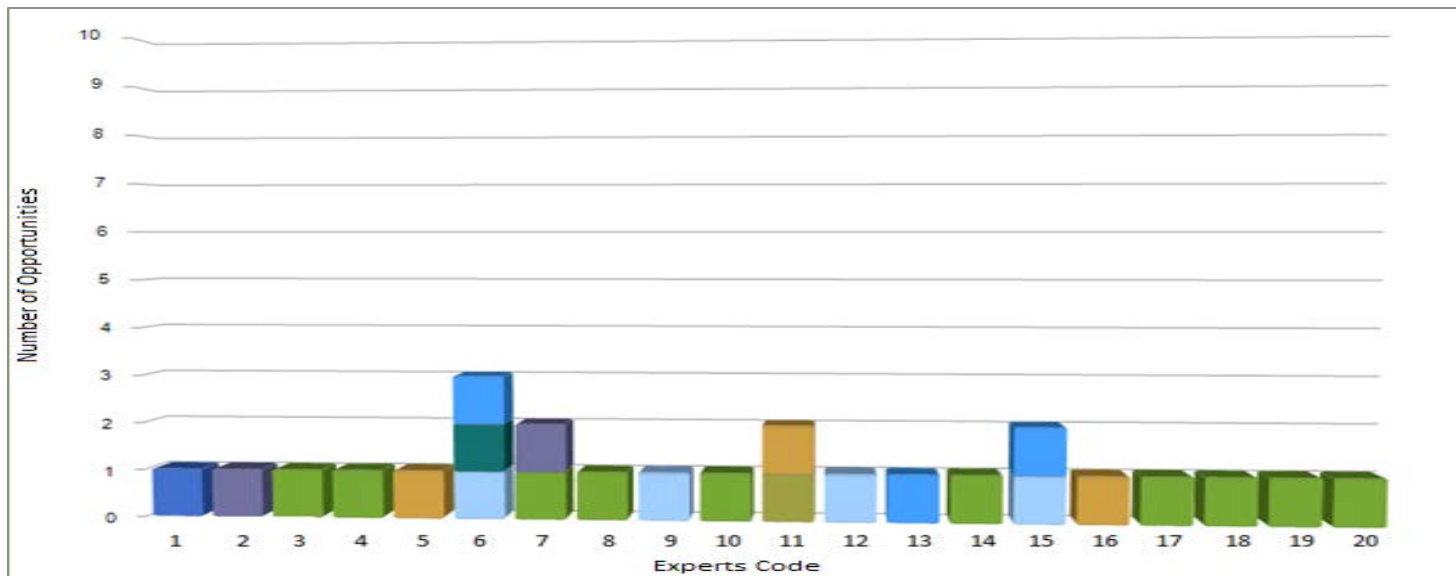
Adaptation Priority Option



Barriers to implement adaptations

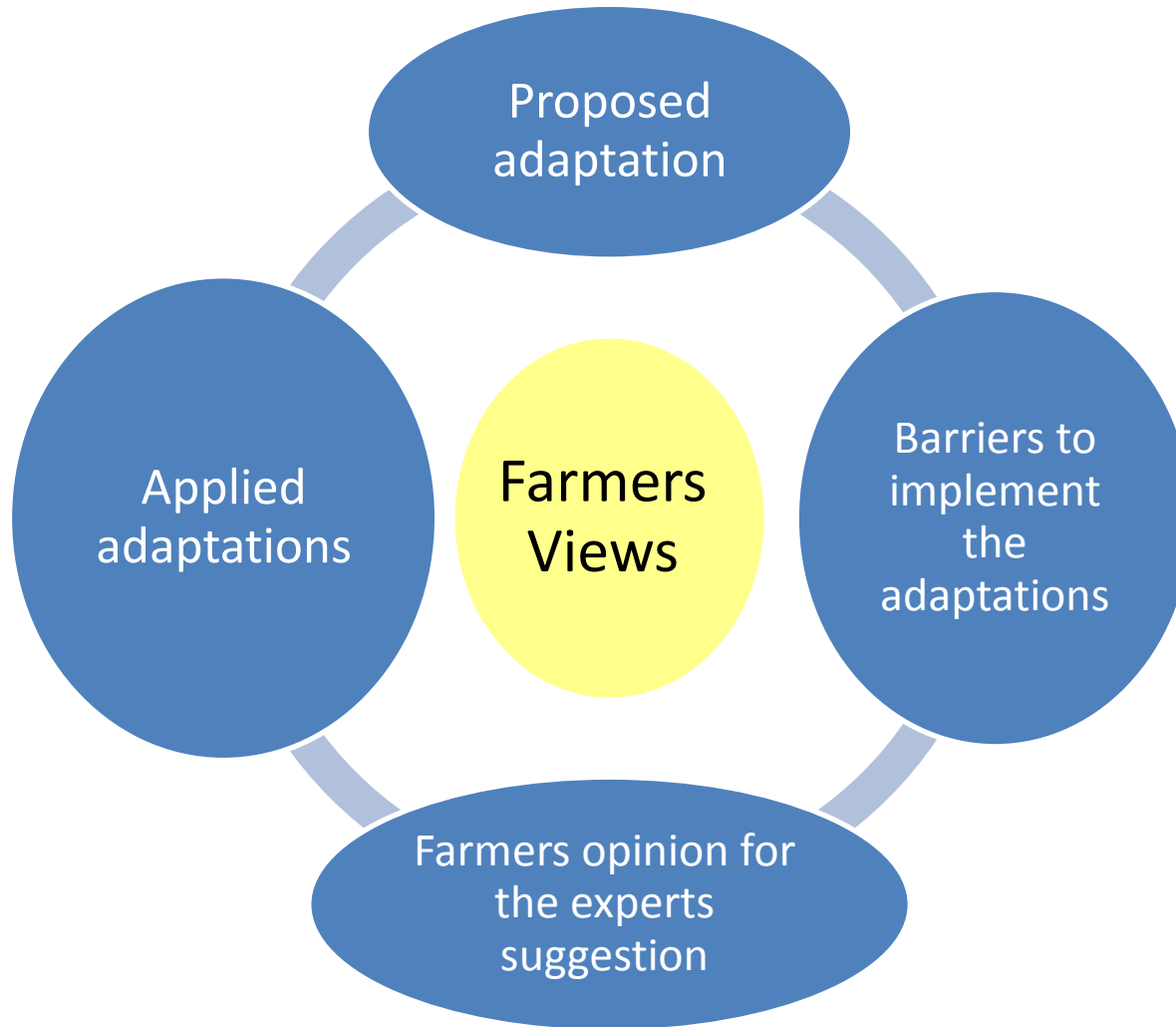


Opportunities to implement adaptation measures



- Availability of the international fund
- Global GAP Certificate that enable farmers to export their production
- Good awareness level of farmers about the water situation
- High percentage of farmers who are using the plastic houses
- High percentage of people who have high education level in Jordan
- The water scarcity situation play as an incentive to conserve water
- There are group of farmers a high education level
- Using water saving devices by number of farmers

Farmers' Views



Currently Practice Adaptation Measures by Farmers



Using Mulch



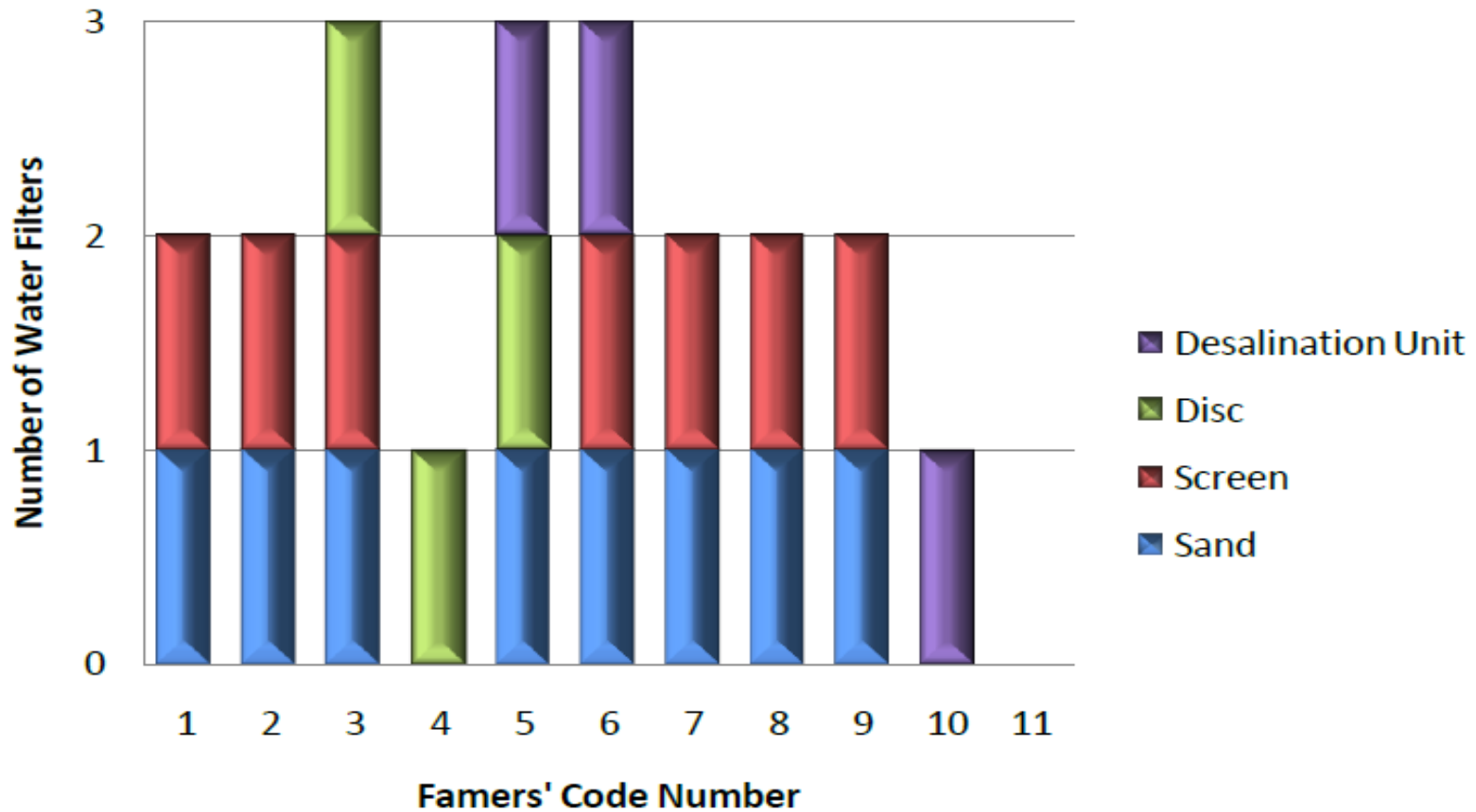
Soilless Culture



Using Multispan



Currently Practice Adaptation Measures by Farmers



Applicable Adaptation Measures

- Applicable adaptation measures
- Best applicable adaptation measures
- Farm-level such as: protected agriculture; changing cultivation date and using plastic mulch
- Policy- level such as: developing climate change strategy and reusing treated wastewater

Gross Margin Benefit

Gross Margin Benefit	Farm 1 (Agribusiness Farm)	Farm2 (Family Farm)
Total Income (JD/0.05 ha)	2178	459
Total cost	1810.92	350.478
GMB (JD/ 0.05 ha)	367.1	108.521

Conclusion

- Adaptation measures on both policy and farm level have potential to minimize the adverse impact of climate change
- Most adaptation measures that already applied by farmers in Jordan are in line with the adaptation applied by other farmers in other countries.
- IWRM is a tool to implementing adaptation measures.
- developing/modifying policies and strategies to include the adaptation measures to climate change

Conclusion

- Most adaptation measures that are needed even if the climate will not change
- Barriers and opportunities to implement adaptation measures
- Smallholder farmers are the most vulnerable to the negative impact of the climate change

Recommendations

- Establishing data bank for climate change adaptation measures in the Arab Region.
- Developing an early warning system all over the country for weather prediction such as drought and frost
- Support the smallholder farmers
- large-scale experiments on identifying, examining and prioritizing all possible adaptation measures

Recommendations

- Promoting participation of all stockholders in all studies pertaining adaptation measures
- Set up a guidelines to enable the decision maker prioritize the adaptation measures options.
- Increasing alternative water resources such rainwater harvesting
- Stop the illegal use of irrigation water

Recommendations

- Cooperation among the ministries, concerning institutions and other stockholders should be achieved.
- Test the applicable adaptation measures identified in this study
- Raise the farmer's and the extension agent awareness

*Thank you for your
attention*