



INTRODUCTION

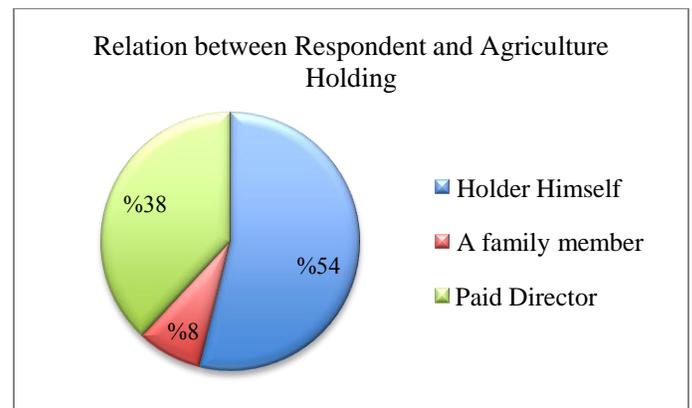
This report shows the results of statistical analysis of the field surveys. Total of (300) questionnaires were distributed over the study area in Jordan, that is Al-Shouneh Al-Janoubeyeh, and targeted farmers in seven communities in the study area. The questionnaires were distributed as follows: Al-Karamah (118 questionnaires), Al-Kafrain and Jofet Al-Kafrain (62 questionnaires), Al-Ramah (64 questionnaires), and Ar-Rawdha, Swaimah, Al-Shouneh Al-Janoubeyeh and Al-Shouneh Al-Jadeedah, (56 questionnaires).

The final results of the Field Survey include the number of targeted agriculture holdings classified according to the type of holding, area of cultivated land, number of domestic livestock and other kinds of animal, agriculture labor force and its distribution according to sex, land use and water resources. According to this the main results of the analysis were divided among the following main categories:

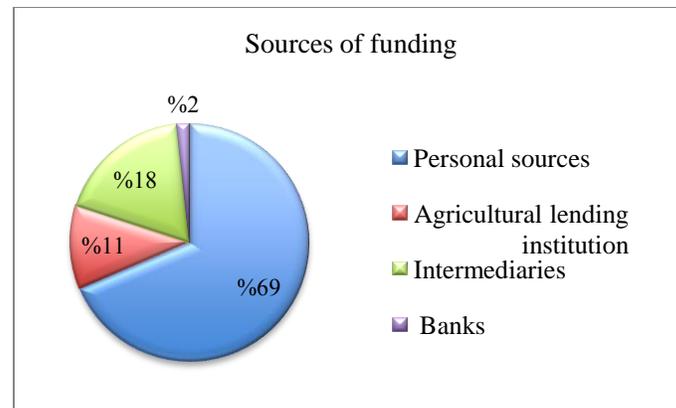
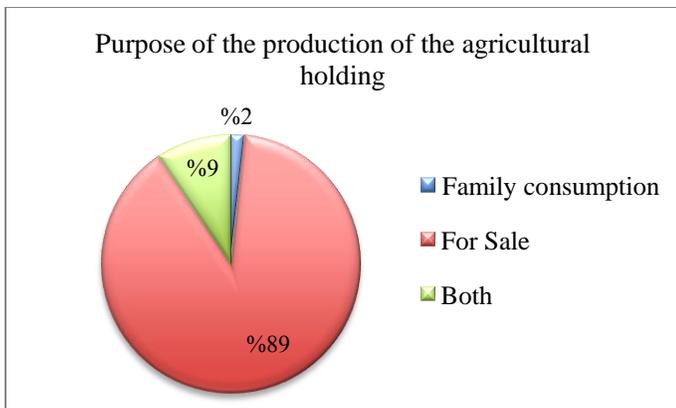
- Agriculture Holdings
- Agriculture Holders
- Water resources
- Water and Soil Quality
- Production Management
- Agriculture Labor Force
- Land Use
- Crops
- Livestock
- Climate Change

1 AGRICULTURE HOLDINGS

The results showed that (93%) of the agricultural holding type was plant production in contrast to (7%) for mixed (plant and animal). As for the management of the agricultural holding, the results indicated that (54%) are managed by the holder himself, (38% are managed by a hired director (Employee) and the rest (8%) are managed by a family member.



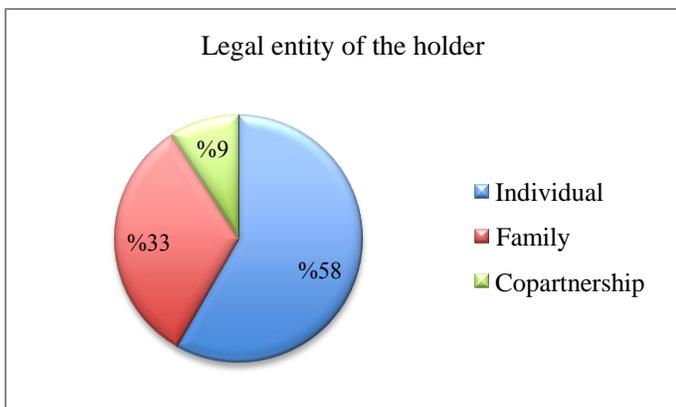
The results showed that the main purpose of the production of the agricultural holding was for sale (89%). The lowest purpose was for family consumption (2%), while the rest stated that the purpose was both (9%). Most farmers distribute to the local market (87%) while a small percentage (5%) sell directly from the farm. A negligible number of respondents export directly.



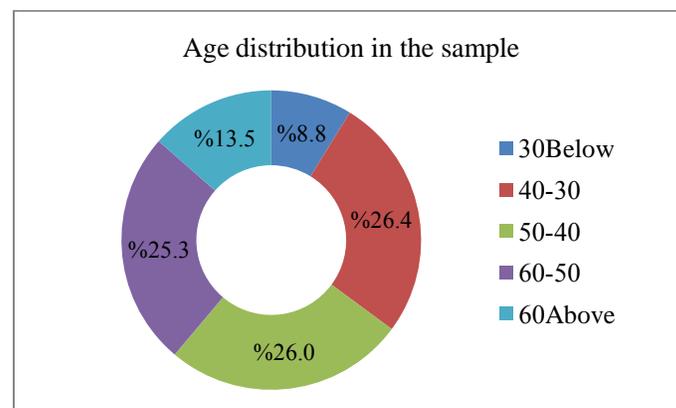
The results indicated that the highest percentage of the sample agriculture holdings in the study area of Jordan was for owned property (63%) while leased for a fixed amount was (35%). Only (2%) was leased for a share of the production. Analysis of the questionnaires showed that males hold (97%) of the sample agriculture holdings, while females hold only (3%). As for the legal entity of the holder, individuals made up (58%) of the sample, while (33%) were held by families, and only (9%) by copartner-ships.

2 AGRICULTURE HOLDERS

The surveys revealed that most of the holders (84%) are of Jordanian nationality, while only (16%) have other nationalities (mainly Egyptian and Pakistani). Holders living in the directorate of Al-Shouneh Al-Janoubeyeh made (75%) of the sample while (25%) lived outside the study area.



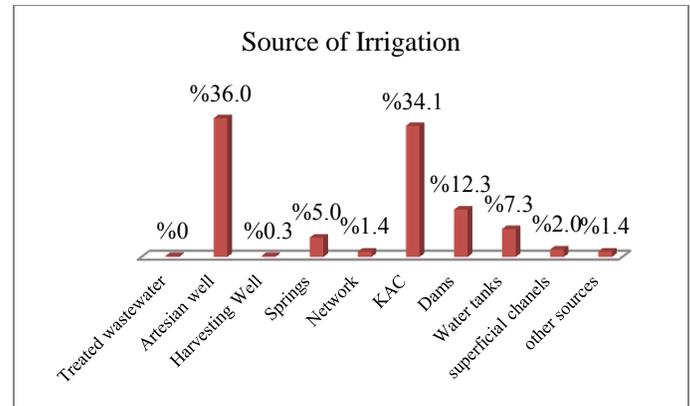
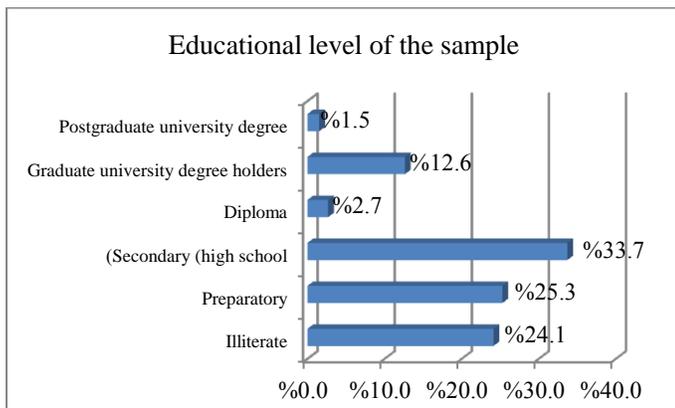
The age distribution of the holders surveyed is illustrated in the chart below. The chart shows that (26.4%) of the holders are aged 30-40 years, (26%) are aged 40-50 years, (25.3%) are aged 50-60 years, (8.8%) are aged below 30 years, and only (13.5%) are aged above 60 years. These numbers give a clear indication that the population is mainly young who are economically active.



The study showed that (69%) of the holders surveyed rely on personal financing resources to finance their holdings, while (18%) are funded by intermediates, (11%) are funded by the agricultural lending institution, and only (2%) are funded through bank loans. The chart below shows the different financing resources and their percentages.

There are about 288 families in the sample with an average family size of (6.7). The targeted households included 1033 males (about 54%) and 884 females (46%). The data also show that 88% of the males are married.

As for educational levels, the surveys revealed that population was dominated by education below high school (59.0%); the second largest group was illiterate with (24.1%). About (14.2%) have bachelor degree or higher, while (2.7%) have diploma.



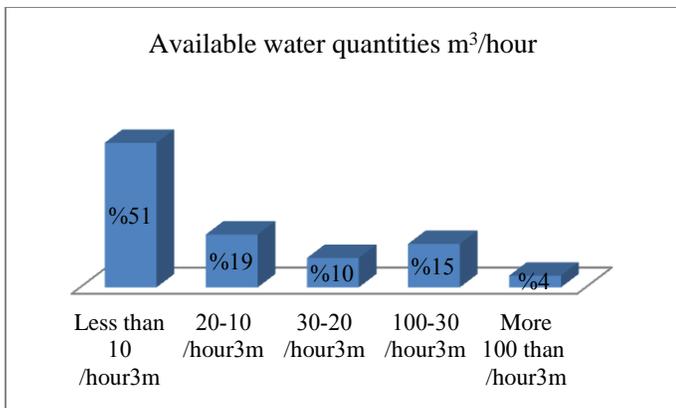
The study indicated that (38%) owned an artesian well while (6%) share percentages of artesian well.

During focus group discussions, farmers indicated that the water is supplied to them 1-2 days per week for 5 hours per day. There are two lines of supply, pumped which provides (6 liters per second lps) of water, and gravity flowing which provides (9 lps). There are more pump lines than gravity flowing lines, and the number depends on the geographical location of the area irrigated.

As for the available water quantities, (51%) of the farmers indicated that it is below (10m³/hour), (19%) of them said it ranged between (10-20 m³/hour), (10%) indicated that available water quantities ranges between (20-30 m³/hour), and about (19%) indicated that more than (30 m³/hour) of irrigation water is available. The chart below shows the distribution of quantities on sample farmers. The results show that the average consumption rate is (20 m³/hour).

3 WATER RESOURCES

The results indicated that the main two sources for irrigation water were artesian wells (36%) and King Abdullah canal KAC (34%). Kafra dam contributes (12.3%) of the irrigation water, private water tankers contribute (7.3%), springs contribute only (5%), and other water resources contribute about (5%). The chart below illustrates the distribution of water resources in the study area.



Average irrigation water price is (8 files/m³) for irrigation water quantities below 2000 m³/month, and (20 files/m³) for higher quantities from surface water resources. However, the Jordanian Ministry of water and Irrigation is considering raising water prices, this is been conducted in close consultations with the local community. When water is bought from private tankers, prices go up to (3.5 Jordanian Dinars JD/m³).

When the farmers were asked about whether water quantities are sufficient for irrigation, (59%) indicated it is enough while (41%) said it is not enough. Those saying it is not enough related the shortage to: the crops require more water, water pressure is not adequate for proper irrigation, long supply cycle and large planted area compared to supply. It should be mentioned her that since about (46%) of the farmers rely mainly on surface water (KAC and Kafraïn Dam), and since available surface water quantities depend mainly on precipitation, it is expected to that considerable percentage of farmers perceives shortage of water quantities as rainfall intensities were, in general, decreased over the last ten years.

4 WATER AND SOIL QUALITY

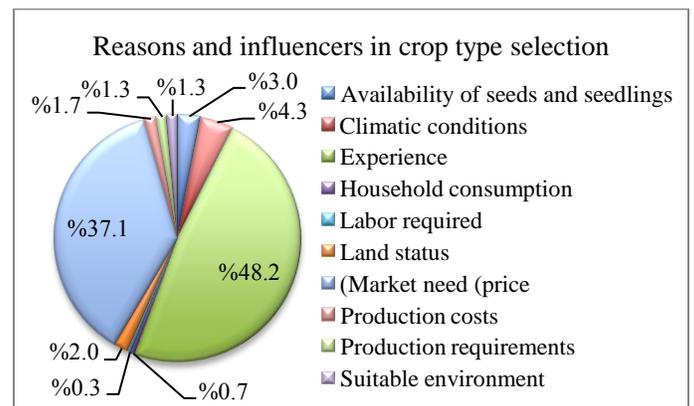
The surveys revealed that (85%) of the farmers feel that water quality is good enough for irrigation and about (15%) said it is not suitable for irrigation. The reasons were high salinity and the use of treated waste water. Regarding soil quality, (88%) consider the soil suitable

for farming while (12%) said it is not. The reason it is not suitable was high soil salinity specially for banana farmers because it affects productivity.

The results show that (90%) of the sample never carried out a soil analysis test. Moreover, (82%) never carried out a water quality analysis. These results conform with the results retrieved through the focus groups where they stated that they do not analyze for water or soil. The only group of farmers that showed interest in water analysis is the banana farmers as water quality highly affects production.

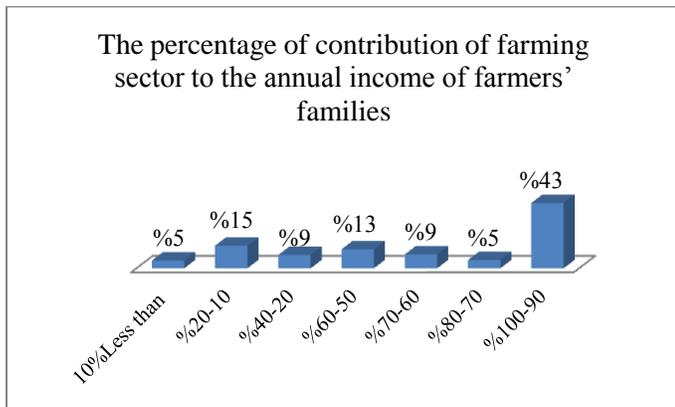
5 PRODUCTION MANAGEMENT

The main decision maker in regards to crop type is the holder himself (69%), (26%) indicated that the owner controls this decision, while only (5%) indicated that they prefer advices from agricultural engineers. The farmers make use of their expertise in deciding the crop type (48%). The chart below shows the different reasons and influencers in crop type selection.



Many farmers indicated that the major problem faced was in the marketing of the final product (51%). The reasons varied between low prices, low export, high percentages of mediator commissions, and closing of the Syrian borders. Most of the farmers (87%) distribute to the local market, while (5%) sell directly from the farm. A negligible number of farmers surveyed export directly.

The results show that about (70%) of the farmers indicated that farming contributes more than (50%) of their income, and (43%) of the sample considered that farming contributes up to (90-100%) of their annual income. The chart below shows the percentage of contribution of farming sector to the annual income of farmers' families.



6 AGRICULTURE LABOR FORCE

PAID WORKERS

Male permanent workers:

The results indicated that about (45%) of agriculture holdings in Al-Shouneh Al-Janoubeyeh hires male permanent non-Jordanian workers, of which (34%) hires one worker, (56%) hires two to five workers, and (10%) hires six or more workers. Only (5%) of agriculture holdings in the study area hires male permanent Jordanian workers, of which (56%) hires one worker, (19%) hires two to five workers, and (25%) hires six or more workers.

The average daily working hours for male permanent workers is (8.2) hours for Jordanians and (8.5) hours for non-Jordanians. The average number of working days through the year was 335 for Jordanians and 319 for non-Jordanians. The average daily income for one permanent worker (either Jordanian or non) is estimated at 13.3 Jordanian Dinars (JD) for Jordanians, and 11.5 JD for non-Jordanians.

Female permanent workers:

The results indicated that only (1.33%) of agriculture holdings in Al-Shouneh Al-Janoubeyeh hires female permanent non-Jordanian workers, all which hires two to five workers. Only (0.33%) of agriculture holdings in the study area hires female permanent Jordanian workers, all which hires six or more workers.

The average daily working hours for female permanent workers is (7.0) hours for Jordanians and (7.75) hours for non-Jordanians. The average number of working days through the year was 320 for Jordanians and 312 for non-Jordanians. The average daily income for one permanent worker is estimated at (7.4 JD) for Jordanians, and (7.1 JD) for non-Jordanians.

Male temporary workers:

The results indicated that about (48%) of agriculture holdings in Al-Shouneh Al-Janoubeyeh hires male temporary non-Jordanian workers, of which (6.3%) hires one worker, (69.2%) hires two to five workers, and (24.5%) hires six or more workers. Only (8%) of agriculture holdings in the study area hires male temporary Jordanian workers, of which (91.7%) hires two to five workers, and (8.3%) hires six or more workers.

The average daily working hours for male temporary workers is (7.7) hours for Jordanians and (7.8) hours for non-Jordanians. The average number of working days through the year was 160 for Jordanians and 189 for non-Jordanians. The average daily income for one temporary Jordanian worker is estimated at 18.9 JD, and 14.8 JD for non-Jordanians.

Female temporary workers:

The results indicated that about (9.7%) of agriculture holdings in Al-Shouneh Al-Janoubeyeh hires female

temporary non-Jordanian workers, of which (7%) hires only one worker, (65.5%) hires two to five workers, and (27.5%) hires six or more workers. About (10.3%) of agriculture holdings in the study area hires female temporary Jordanian workers, of which (3%) hires only one worker, (87%) hires two to five workers, and (10%) hires six or more workers.

The average daily working hours for female temporary workers is (8.0) hours for Jordanians and (7.7) hours for non-Jordanians. The average number of working days through the year was 131 for Jordanians and 148 for non-Jordanians. The average daily income for one temporary worker is estimated at (12.9 JD) for Jordanians, and (10.2 JD) for non-Jordanians.

Male random workers:

The results indicated that about (27.7%) of agriculture holdings in Al-Shouneh Al-Janoubeyeh hires male random non-Jordanian workers, of which (1.2%) hires one worker, (70%) hires two to five workers, and (28.8%) hires six or more workers. Only (4.3%) of agriculture holdings in the study area hires male random Jordanian workers, of which (15.5%) hires one worker, (61.5%) hires two to five workers, and (23%) hires six or more workers.

The average daily working hours for male random workers is (7.0) hours for Jordanians and (7.5) hours for non-Jordanians. The average number of working days through the year was 50 for Jordanians and 52 for non-Jordanians. The average daily income for one random worker for Jordanians is estimated at 25 JD, and 20.3 JD for non-Jordanians.

Female random workers:

The results indicated that only (4%) of agriculture holdings in Al-Shouneh Al-Janoubeyeh hires female random non-Jordanian workers, of which (8.3%) hires one worker, (66.7%) hires two to five workers, and (25%) hires six or more workers. Only (3%) of

agriculture holdings in the study area hires female random Jordanian workers, of which (11.1%) hires one worker, (66.7%) hires two to five workers, and (22.2%) hires six or more workers.

The average daily working hours for female random workers is (7.8) hours for Jordanians and (7.7) hours for non-Jordanians. The average number of working days through the year was 61 for Jordanians and 60 for non-Jordanians. The average daily income for one random worker for Jordanians is estimated at 24.4 JD, and 17.6 JD for non-Jordanians.

UNPAID WORKERS:

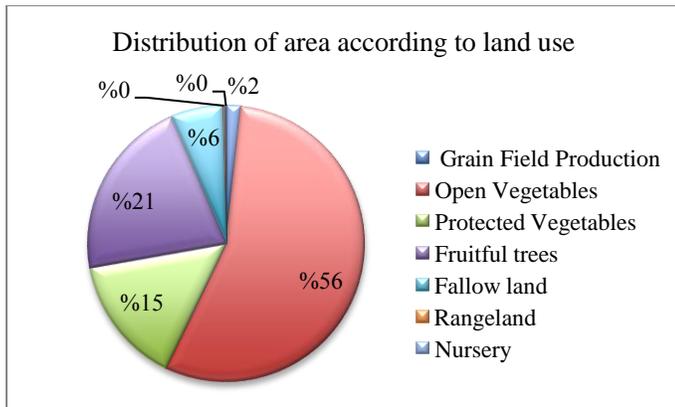
The results indicated that about (9%) of agriculture holdings in Al-Shouneh Al-Janoubeyeh have non-Jordanian males working in their own farms, of which (59.3%) have one worker, (37%) have two to five workers, and (3.7%) have six or more workers. On the other hand, about (81.7%) of agriculture holdings in the study area have male Jordanians working in their own farms, of which (73.1%) have one worker, (25.7%) have two to five workers, and (1.2%) have six or more workers. The average daily working hours for male unpaid workers is (5.6) hours for Jordanians and (6.6) hours for non-Jordanians. The average number of working days through the year is 272 for Jordanians and 297 for non-Jordanians.

The results indicated also that about (2.7%) of agriculture holdings in Al-Shouneh Al-Janoubeyeh have non-Jordanian females working in their own farms, of which (25%) have one worker, (62.5%) have two to five workers, and (12.5%) have six or more workers. On the other hand, only (2.3%) of agriculture holdings in the study area have female Jordanians working in their own farms, of which (57%) have one worker, and (43%) have two to five workers. The average daily working hours for female unpaid workers is (6.7) hours for Jordanians and (8.4) hours for non-Jordanians. Their average number of working days throughout the year is 268 for Jordanians and 326 for non-Jordanians.

7 LAND USE

The total area of agriculture holdings in the study area of Jordan is (11331 dunums), of which 93% (10558 dunums) is arable land; while there is 7% (773 dunums) considered non-arable land.

The Pie-chart below shows the distribution of area according to land use in the sample surveyed. As can be seen, the highest area is for vegetables (open air) (6528 dunums) which makes 55.5% of the study area. This is followed by fruit trees with an area of 2507.5 dunums (21.3%). The third main use is for protected vegetables with an area of 1765 dunums (15%).

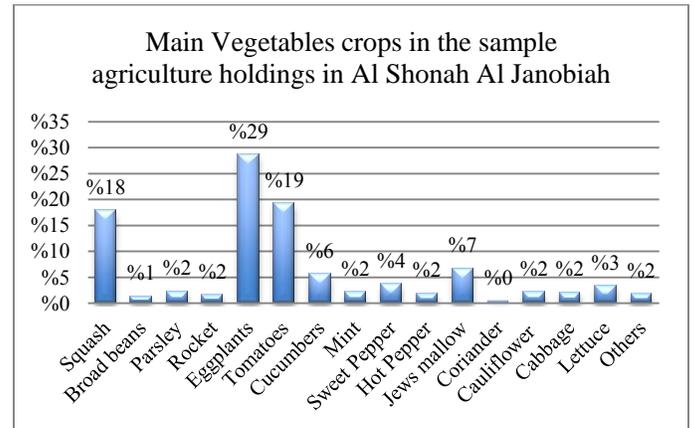


8 CROPS

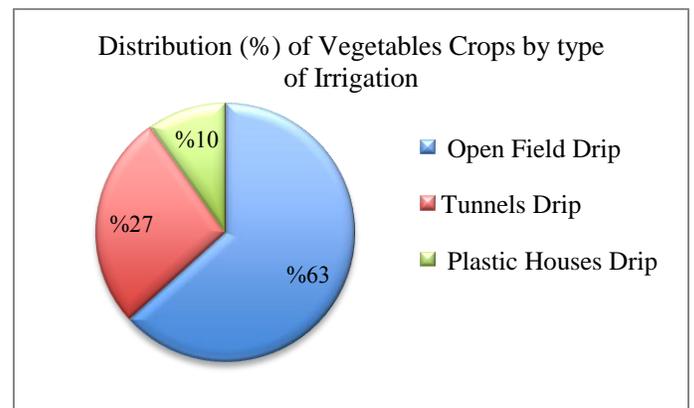
VEGETABLES

About 7598 dunums (69.7% of the total surveyed areas) are cultivated with vegetables. The surveys revealed that about 2177 dunums (29% of the area surveyed) is cultivated with eggplants, 1454 dunums (19%) is cultivated with tomato, 1351 dunums (18%) with squash, 505 dunums (7%) with jews mallow, 428 dunums (6%) is cultivated with cucumber, and about 2-3% is cultivated with each of parsley, rocket, sweet and hot pepper, cabbage and lettuce. The figure below shows main vegetables crop cultivated in the study area. Vegetable

crops are planted as single crop (95%) and only (5%) are planted as cascaded crops.



All areas cultivated with vegetables are irrigated areas (no rain-fed areas). The most predominant irrigation method is open field drip irrigation with an area of 4809 dunums (63%), This is followed by tunnels Drip irrigation with an area of 2040 dunums (27%), while small areas are plastic houses drip irrigation (particularly for cucumber, sweet pepper, tomato and eggplants) with an area of 749 dunums (10%). The figure below shows the distribution (%) of Vegetables Crops by type of Irrigation.

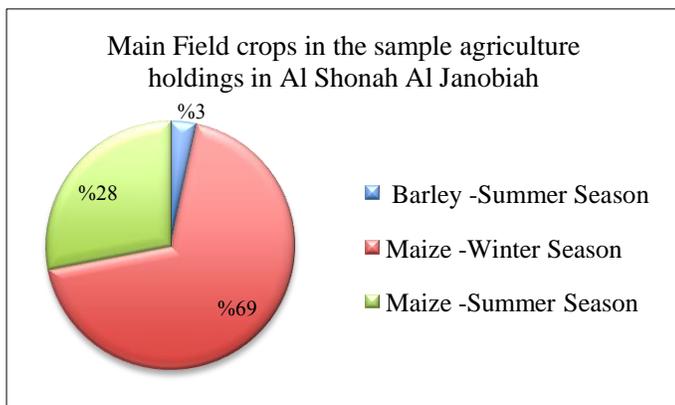


Estimated production quantity of vegetables is 19421 tons. In average, more than (85%) of the vegetables production is being bought to the local market, while (1.5%) is exported directly (particularly for squash and cucumber), and about 12% is considered damaged.

About (1.5%) is consumed by the farmers and their families.

FIELD CROPS

The surveys revealed that farmers cultivate only two field crops in the study area, these are barley and maize, the latter is being cultivated in both winter and summer seasons, while barley is being cultivated in summer. Of the sample surveyed, the total area cultivated with field crops is estimated at (797 dunums) that represents only (7.3%) of the total area surveyed. Of these 797 dunums only 27 dunums (3%) are cultivated with barley, 546 dunums (69%) with maize-winter season, and 224 dunums (28%) with maize-summer season. Field crops are planted as single crop (90%) and only (10%) are planted as cascaded crops.

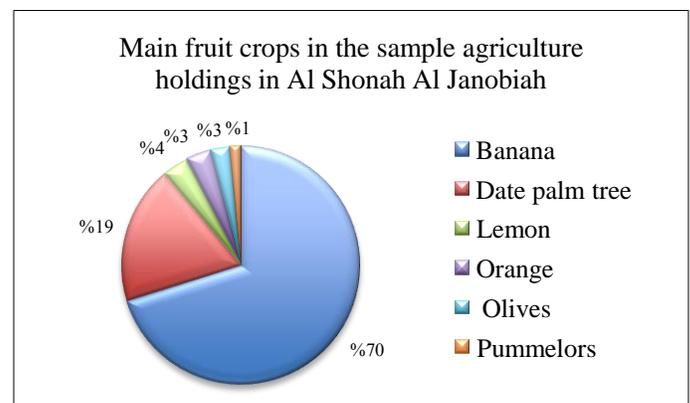


All area cultivated with barley is rain-fed, while areas cultivated with maize (either in winter or summer) is irrigated areas, of which (48%) is surface-irrigated area and (52%) is drip-irrigated area, while sprinklers are not used at all to irrigate field crops.

Estimated production quantities of maize in winter and summer seasons are 538 and 260 tons (total of 798 tons) with an estimated production rate of (1.04 ton/dunum). About (86%) of the production was bought to the local market, (1%) was for farmers own use, while (13%) was considered as damaged. As for Barley, only one holder mentioned that he grows barley and did not specify the production although barley is grown in the northern parts of Jordan.

FRUIT TREES

The surveys revealed that farmers cultivate six main fruit trees in the study area; these are banana, date balm, lemon, orange, olives and pummelors. Of the surveyed sample, about 2507 dunums are cultivated with fruit trees, this represents about (23%) of the total areas surveyed. The figure below shows areas cultivated with these fruit trees. As can be noted about (70%) of the area is cultivated with banana, (19%) with date balm, (4%) with lemon, and (3%) with each of orange and olives. Fruit trees are planted as main crop (88%) and only (12%) are planted as scattered crops.



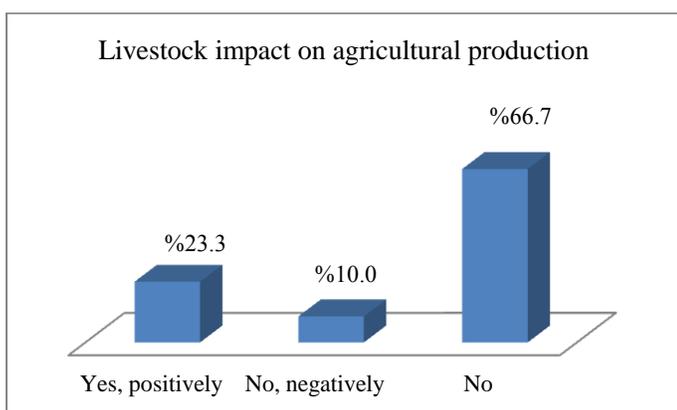
All areas cultivated with fruit trees are irrigated areas (no rain-fed areas). Estimated production quantity of fruit trees is 2983.12 tons. Most of the banana produced (90%) is being bought to the local market, while (8%) is considered damaged, and (2%) is being consumed by farmers and their families. On the other hand, 35-45% of date balm, lemon, orange and pummelors is bought to the local market, while only (17%) of olive production is bought as (76%) is consumed by farmers. (Annex 4)

9 ANIMAL PRODUCTION

As for the animal production in the area, a small percentage of the sample raises animals (8%). The animals ranged between poultry and fish. Poultry production was (2%) and included a 20000 bird production farm. There are also domestically raised hens

raised in the houses of around 130 hens. As for fish production, it makes (0.3%) of the sample (6 fish farms).

As the questionnaire showed, (85%) of those who owned animals are not affected with animal ownership when deciding their production crop. Many animal owners (66%) stated that there was no positive or negative effect of animal production on agricultural production. The following chart shows the impact of livestock on agricultural production.



10 CLIMATE CHANGE

The survey results show that (49%) of the sample stated that they have noticed significant changes in weather in the past 10 years. In another question, (48%) said that there is no effect of weather change on the agricultural sector in the region. Only (26%) said it has a negative effect and another (26%) said it had a positive impact. The main changes noticed were increase in ambient temperatures in summer and frost and decreased rain fall in winter. Among the negative effects were damaged crops, decreased yields and increased diseases.

As for any changes in the planting date (agricultural season), (88%) of the sample said there was no change during the last ten years. And as for the impact of increased temperature on the agricultural production, (37%) stated that it had a positive effect while (37%) said it had a negative effect with the rest (27%) said it didn't

have any impact. Main negative impacts are the increasing demand on water, and crop damage.

The study also shows that (89%) of the sample said there was no change in land use in the past (10) years, and only (15%) of the farmers stated that there were changes in vegetables planted over the last (10) years that are attributed to climate change and increase in ambient temperature. Also (15.3%) of the farmers surveyed indicated that lands available for agricultural production have decreased during the last (10) years, and this is mainly due to climate change.

11 ANNEX

Annex 1: Area of Vegetables Crops in Al-Shouneh Al-Janoubeyeh by Number of Agriculture Holdings and Season

Type of Crop	Winter		Summer		Total	
	Number of Agriculture Holdings	Area	Number of Agriculture Holdings	Area	Number of Agriculture Holdings	Area
Squash	65	1196	10	156	75	1351
Broad beans	8	101	-	-	8	101
Parsley	18	167	-	-	18	167
Rocket	15	121	-	-	15	121
Eggplants	100	2074	6	103	106	2177
Tomatoes	87	1257	21	197	108	1454
Cucumbers	21	397	2	31	23	428
Mint	16	160	-	-	16	160
Sweet Pepper	18	239	4	39	22	278
Hot Pepper	18	145	-	-	18	145
Jews mallow	9	435	2	70	11	505
Coriander	7	22	-	-	7	22
Cauliflower	12	161	-	-	12	161
Cabbage	5	154	-	-	5	154
Lettuce	13	245	-	-	13	245
Others	15	92	4	41	19	133

Area in Dunum, Winter Season (8-11), Summer Season (12-7)

Annex 2: Area of Vegetables in Al-Shouneh Al-Janoubeyeh by Type of Irrigation, type of crop and type of protection

Type of Crop	Rainfed Area (Dunum)	Open Field Drip Area (Dunum)	Type of protection		Production Total (tons)
			Tunnels Drip Area (Dunum)	Plastic Houses Drip (Dunum)	
Squash	-	768	583	-	1744
Broad beans	-	101	-	-	65
Parsley	-	152	15	-	357
Rocket	-	121	-	-	212
Eggplants	-	1630	464	83	7915
Tomatoes	-	815	539	100	4776
Cucumbers	-	114	38	276	1205
Mint	-	98	62	-	372
Sweet Pepper	-	15	7	256	502
Hot Pepper	-	42	95	8	177
Jews mallow	-	325	180	-	701
Coriander	-	22	-	-	16
Cauliflower	-	141	20	-	336
Cabbage	-	119	20	15	577
Lettuce	-	227	18	-	335
Other crops	-	121	-	12	131
Total	-	4809	2040	749	19421

Annex 4: Number, area, production and distribution of Fruit trees in Al-Shouneh Al-Janoubeyeh

Type of crop	# of Agriculture Holdings	Irrigated trees		Production (Tons)	Production Distribution (%)			
		#	Area		Local Market	Export	Damaged	Household consumption
Banana	84	159550	1734	2824	80%	0%	8%	2%
Date palm	19	7912	465	77	45%	0%	7%	28%
Lemon	12	2023	88	42	40%	0%	0%	35%
Orange	8	2812	86	19	36%	0%	1%	26%
Olives	13	1704	64	10	17%	0%	0%	76%
Pummelors	3	350	35	10	33%	0%	0%	0%
Others	3	210	35	1	33%	0%	0%	33%
Total	142	174561	2507	2983	41%	0%	2%	29%

Annex 5: Area of field Crops in Al-Shouneh Al-Janoubeyeh by Number of Agriculture Holdings, Season and field status

Field crops	Season	Number of Agriculture Holdings	Field Status	
			One field crop	Cascaded
Barley	Summer	1	1	0
Maize	Winter	27	25	2
Maize	Summer	12	10	2
Total	-	40	36	4

Annex 3: Distribution of vegetables crops production in Al-Shouneh Al-Janoubeyeh

Vegetables crops	Local Market %	Export %	Damaged %	Consumption and gifts %
Squash	89%	6%	4%	2%
Broad beans	80%	0%	17%	2%
Parsley	96%	0%	3%	1%
Rocket	96%	0%	3%	1%
Eggplants	83%	1%	14%	1%
Tomatoes	76%	4%	18%	3%
Cucumbers	86%	6%	6%	2%
Mint -Winter Season	86%	0%	13%	1%
Sweet Pepper	95%	0%	2%	3%
Hot Pepper	89%	3%	7%	2%
Jews mallow	77%	0%	22%	0%
Coriander	98%	0%	1%	1%
Cauliflower	89%	0%	10%	1%
Cabbage	42%	0%	55%	3%
Lettuce	89%	0%	10%	1%
Others crops	87%	0%	8%	5%
Average	85%	1%	12%	2%

Annex 6: Area of field Crops in Al-Shouneh Al-Janoubeyeh by Area, production and Type of Irrigation

Field crops	Total Area (Dunum)	Rainfed Area (Dunum)	Irrigated Area (Dunum)		Production (tons)
			Surface Irrigated	Drip irrigated	
Barley	27	27	0	0	0
Maize	546.5	0	235	311.5	538
Maize	223.5	0	133	90.5	260
Total	797	27	368	402	797.5

Annex 7: Distribution of field Crops production in Al-Shouneh Al-Janoubeyeh

Field crops	Local Market %	Export %	Damaged %	consumption and gifts %
Barley				
Maize	85%	0%	14%	2%
Maize	86%	0%	13%	1%
Total	86%	0%	13%	1%