Analysis Report of Jericho and Al-'Auja Sample

INTRODUCTION

This report aims at providing analysis of data collected through field survey, focus groups and secondary research and the main results of the project field survey. The latter was based on a total number of questionnaires of 152; 121 in Jericho and 31 in Al-'Auja, which represents 26.4% of the total number of agriculture holdings in Jericho and Al Auja; 10% of Jericho and Al- Aghwar Governorate. 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 animals, agriculture labor force and its distribution according to sex, land use and water resources. That, in addition to information about the change in weather conditions during the last ten years in Jericho and Al-'Auja.

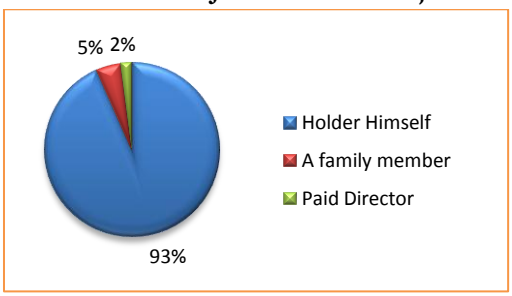
Accordingly, the main results of analysis were divided into the following main categories:

1. Agriculture Holdings
2. Agriculture Holders
3. Water resources
4. Water and Soil Quality
5. Production Management
6. Agriculture Labor Force
7. Land Use
8. Crops
9. Livestock
10. Climate Change

AGRICULTURE HOLDINGS

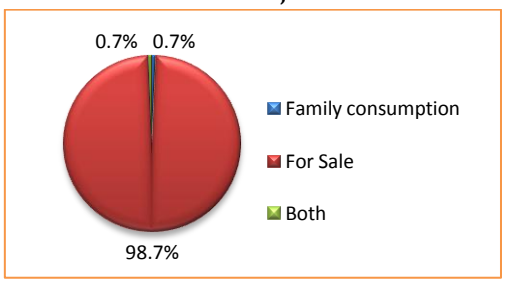
The results indicated that all Jericho and Al-'Auja selected sample concerning the agricultural holding type was plant holdings. The sample represented about 26.4% of all agriculture holdings in Jericho and Al-Auja (PCBS, 2010). As for the Agriculture holding management method, 93.4% are managed by the holder himself (figure 1).

Figure1: Agriculture Holdings management Methods in Jericho and Al-'Auja



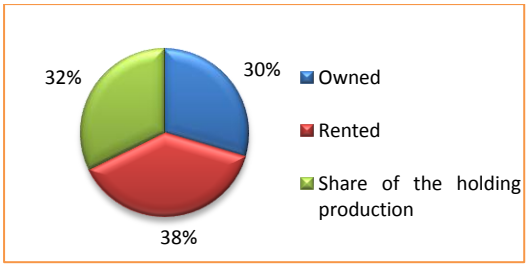
The main purpose of production of most of the sample agriculture holdings in Jericho and Al-'Auja (98.7%) was for sale (figure 2).

Figure2: Main purpose of production in the sample agriculture holdings in Jericho and Al 'Auja



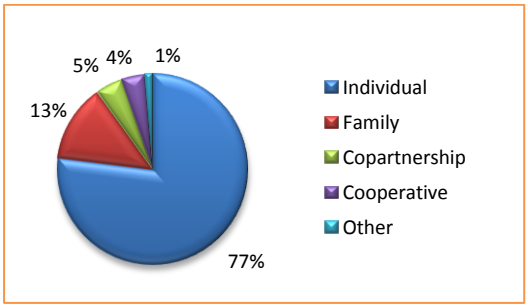
The results indicated that 38.2% of the sample agriculture holdings in Jericho and Al-'Auja are rented, 32.2% of them are cultivated in return for a share of the holding production, and 29.6% of the agriculture holdings are owned by the agriculture holders(figure 3).

Figure 3: Land tenure in the sample agriculture holdings in Jericho and Al-Auja



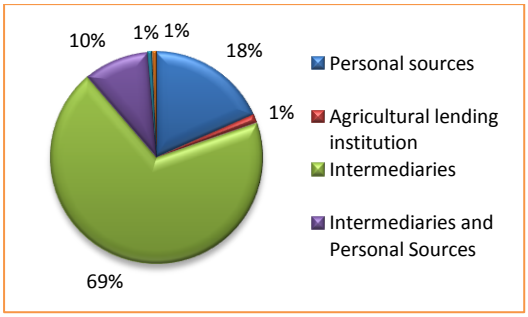
Males hold 95.4% of the sample agriculture holdings, while females hold only 4.6%. Most of the sample agriculture holdings in Jericho and Al-'Auja (77%) were held legally by an individual holder, 13.2% were held by a household member (figure 4).

Figure 4: Legal Status of Agriculture Holdings in Jericho and Al-'Auja



Also, the results indicated that 69.1% of the sample agriculture holdings were funded by the intermediates, 18.4% by holders' personal sources, and 9.9% by intermediates and holder personal sources (figure 5).

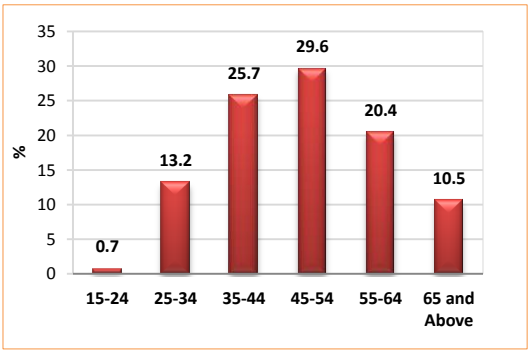
Figure5: Agricultural holdings main source of funding in Jericho and Al-'Auja



AGRICULTURE HOLDERS

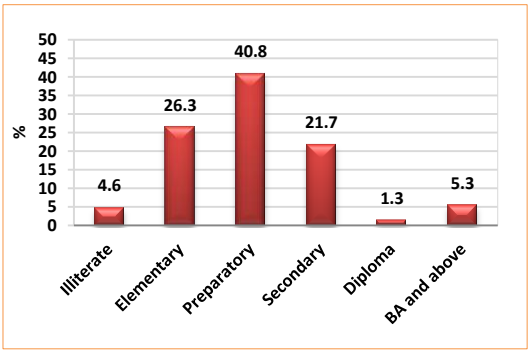
The survey targeted 152 agriculture holders, 29.6% aged 45-54 years, 25.7% aged 35-44 years, 20.4% aged 55-64 years and 13.2% aged 25-34(figure 6). Also all the holders were Palestinians from Jericho and Al Aghwar Governorate.

Figure 6: Agriculture Holders in Jericho and Al-'Auja by age group



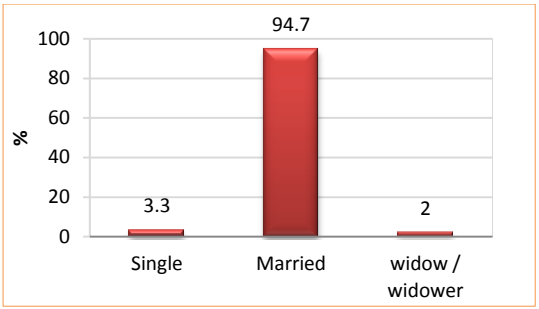
In term of educational attainment, 88.8% of agriculture holders in Jericho were dominated by education below high school (elementary, preparatory and secondary levels) (figure 7).

Figure 7: Educational Attainment of Agriculture Holders in Jericho and Al-'Auja



The Household average size of the targeted agriculture holders in Jericho and Al-'Auja was 6.9; the targeted sample included 557males and 489 females. As for the marital status, 94.7% of the sample agriculture holders were married (figure 8).

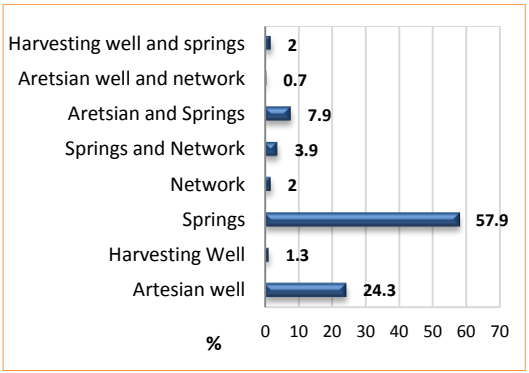
Figure 8: Marital Status of Agriculture Holders in Jericho and Al-'Auja



WATER RESOURCES

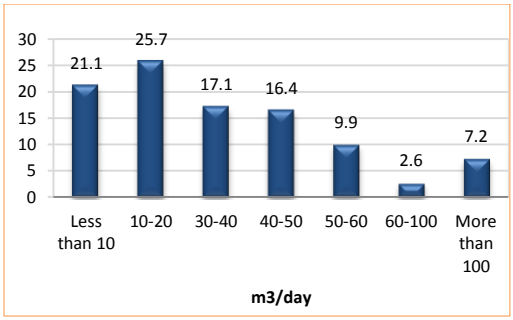
The results indicated clearly that the main source of irrigation water was springs (57.9%) in Jericho and Al-'Auja through Ein Al-Sultan and Al-'Auja springs, the second source of irrigation water was the Artesian wells (24.3%) (figure 9).

Figure 9: Main source of irrigation water in the Agriculture Holdings



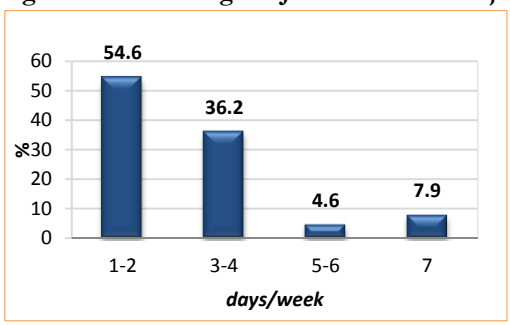
The sample indicated that (25.7%) of the targeted holdings in Jericho and Al-'Auja owned artesian wells while (2.6%) of them share percentages of artesian wells. Also, the sample indicated that for the 152 agriculture holdings the average available amount of irrigation water from the different water sources was 30.6 m^3 per hour (figure 10), the consumption rate was 28.06 m^3 per hour, and the average cubic meter price was 1.14 JD.

Figure 10: Available water quantities (m3/day)



As for the irrigation frequency, 54.6% of the holders irrigated one to two days per week, 36.2% irrigated three to four days per week (figure 11), and the average irrigation duration was 5.2 hours.

Figure 11: Irrigation frequency in the Sample Agriculture Holdings in Jericho and Al-'Auja



According to the sample,40.8% of the holders indicated that the available water for irrigation was not enough due to many reasons, such as: Spring's water is not available the whole year due to Israeli control over Al-'Auja spring, there was inconsistent amount of available water in the artesian wells.

WATER AND SOIL QUALITY

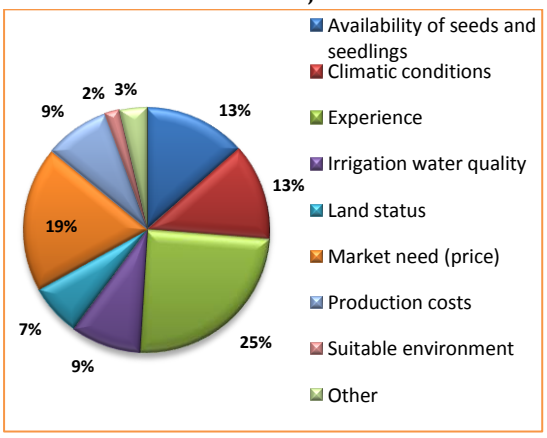
The sample results showed that in 96.1% of the agriculture holdings, the quality of water was suitable for irrigation, while in 3.9% the quality of water was not suitable due to artesian wells salinity. On the other hand 96.1% of the agriculture holders indicated that the soil quality is suitable for the different types of crops, while 3.9% indicated that the soil quality is not

suitable because of soil salinity. The results showed that (80.9%) of the sample holders never carried out a soil analysis test. Moreover, 82.2% of the holders never carried out water quality analysis.

PRODUCTION MANAGEMENT

The main decision maker in selecting the crop type to be planted in the agriculture holding was the holder himself (82.2%), 17.1%the owner of the agriculture holding, and only 0.7% indicated that they sought advice from agriculture engineers in selecting the main type of crops. 24.7% of the holders depend on their own expertise in deciding the crop type (figure 12).

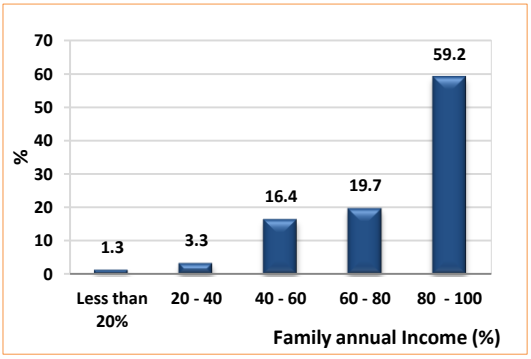
Figure 12: Reasons for selecting the main crops in the Agriculture Holdings in Jericho and Al-'Auja



The sample indicated that majority of agriculture holders faced problems in marketing their field crops (86.2%); the main problems are represented in the lack of external and internal marketing channels and in high mediator commissions. The results showed that most of the agriculture holders distribute their production to Jericho and Al Aghwar Local Markets (99.4%) and none of the holders export their production.

In general the sample indicated that the return from the agriculture holdings contribute with 84.3% to the agriculture holder's annual income (figure 13).

Figure 13: Contribution of farming sector to the agriculture holder annual income in Jericho and Al-'Auja



AGRICULTURE LABOR FORCE

1.1 Paid Workers:

Male permanent workers

The results indicated that 133 (87.5%) agriculture holdings in Jericho and Al-'Auja sample hired permanent waged male workers, of which 80.5% hired two to five, 12% hired one, and 7.5% hired six workers or more. The average daily working hours per one permanent male worker was 7.4 hours, the average number of working days through the year was 271.8 days, and the average income per one day was approximately 14.02 JD.

Female permanent workers

The results indicated that 13 (8.6%) agriculture holdings in Jericho and Al-'Auja sample hired permanent waged female workers, of which 61.5% hired one, and 38.5% hired two to five. The average daily working hours per one

permanent female worker was 6.5 hours, the average number of working days through the year was 266.7 days, and the average income per day was approximately 12.5JD.

Temporary Waged Male workers

There were 95 agriculture holdings in Jericho and Al-'Auja sample that hired temporary waged male workers, of which 74.7% hired two to five, 18.9% hired one, and 6.3% hired six or more. The average daily working hours per one worker were 6.4 hours, the average number of working days through the year was200.4 days, and the average income per one worker for each day was approximately 11.5 JD.

Random Waged Male Workers

In addition to Temporary and Permanent workers, there were 3 agriculture holdings in Jericho and Al-'Auja hired random waged male workers, of which 66.7% hired two to five and 33.3% hired one worker. The average daily working hours per one worker were 4hours, the average number of working days through the year was77 days, and the average income per one worker for each day was approximately 10.36 JD.

1.2 Unpaid workers:

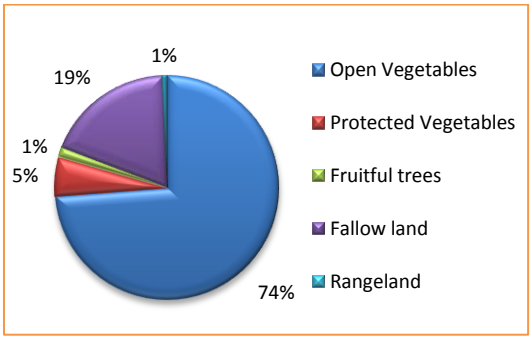
There were 43 agriculture holdings in Jericho and Al-'Auja sample that hired unpaid household member (male and female), of which 43 holdings hired male members and 38 hired both female and male members. The average daily working hours per one male were 15.77 hours, and 9.7 hours per one female. On the other hand, the average number of working days through the year was 265.6days for a male family member and 269.2 for female. For the male family members, 67.4% of the agriculture holdings hired two to five male workers, 30.2% hired one and 2.3% hired six or more. While for the female family members, 76.3% of the agriculture holdings hired one female and 23.7% hired two to five females.

LAND USE

The total area of agriculture holdings in Jericho and Al-'Auja sample was 7,172.5 dunums. Arable land made up 6,736.5 dunums (93.9%) of the total area while non-arable land made up 436 dunums (6.1%).

Cultivated land was distributed as follows: 73.8% cultivated land area of open vegetables crops, 5.5% of protected vegetables crops, 18.6% under temporarily fallow lands, 1.5% cultivated land area of fruitful trees, and only 0.6% is considered as rangelands(figure 14).

Figure 14: Cultivated Land Distribution in Jericho and Al-'Auja sample



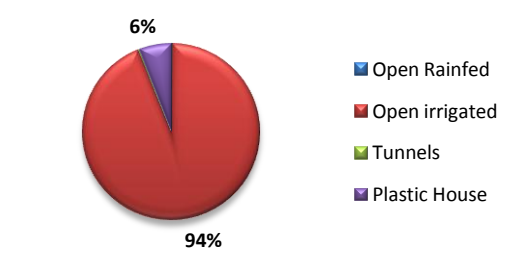
2. CROPS:

2.1 Vegetables Crops:

The area of land cultivated with vegetables crops in Jericho and Al-'Auja sample was 9,546 dunums; 6,237 dunums (69.9%) cultivated in winter season and 2,715.5 dunums (30.1%) cultivated in summer season. Uncovered rainfed crops were planted on 18 dunums (0.2%), uncovered irrigated

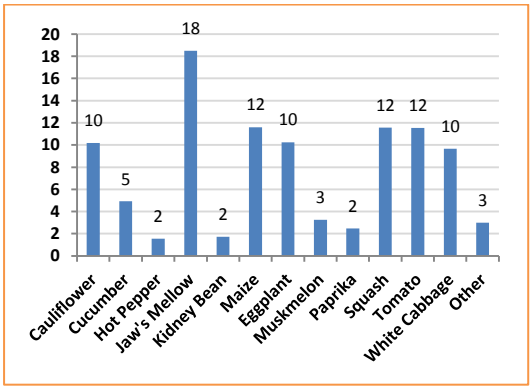
vegetables crops were planted on 8,952.5dunums (93.8%), covered irrigated tunnels were planted on 20.5 dunums (0.2%), and covered irrigated plastic houses were planted on 555 dunums (5.8%) (Figure15, annexes 1: Area of Vegetables Crops in Jericho and Al-'Auja Sample by Number of Agriculture Holdings and Season and annex 2: Area of Vegetables in Jericho and Al-'Auja Sample by Type of Irrigation, type of crop and type of protection).

Figure 15: Distribution (%) of Vegetables Crops in Jericho and Al-'Auja Sample by type of Irrigation



18% of the vegetables area surveyed was cultivated with Jaw's Melow (Figure 16).

Figure 16 main vegetables crops (by percent) in the sample agriculture holdings in Jericho and AL Auja.

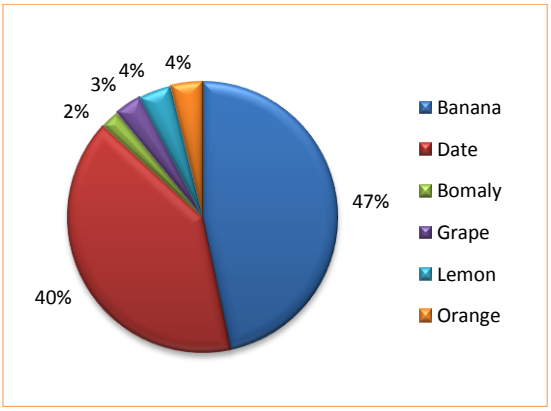


On the other hand, the results of the sample indicated that 99.3% of the vegetables production in Jericho and Al Aghwar local markets from the agriculture holdings is distributed directly or through intermediates. Also, the results showed that there were no export channel for the vegetables production (annex 3: Distribution of vegetables crops production in Jericho and Al-'Auja Sample).

2.2 Fruit Trees

The area of land cultivated with fruit trees was 300 dunums. Banana trees made up 46.7% of the total area of fruit trees, date made up 40.2%, and citrus trees made up 9.8% (figure 17). Irrigated fruit trees accounted for all the total area of fruit trees. In total, there were 206 fruit trees: 10 banana trees, 80 date trees, 6 bomaly trees, 80 grape trees, 10 lemon and 20 orange trees (annex 4: Number, area, production and distribution of Fruit trees in Jericho and Al-'Auja sample)

Figure 17: Main fruit trees in the sample agriculture holdings in Jericho and Al-'Auja



As for production, the results of the sample indicated that there was no export channel for fruit trees production, and about 96.5% of the agriculture holdings production distributed locally in Jericho and AL Aghwar Governorate (annex 4 Number, area, production and distribution of Fruit trees in Jericho and Al-'Auja sample).

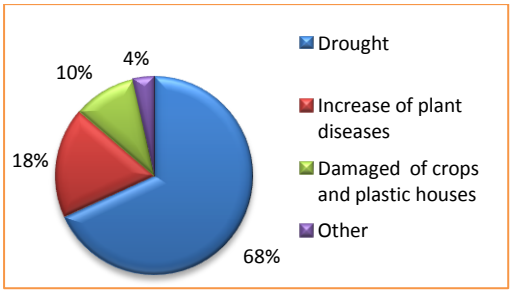
ANIMAL PRODUCTION

Concerning livestock in Jericho and Al-'Auja sample, 17 agriculture holdings raised livestock in addition to their main plant holdings (11.2%), of which 7 holdings (41.2%) owned sheep, 5 (29.4%) owned goats, and 5 (29.4%) owned both goats and sheep. In total there were 130 sheep in 12 agriculture holdings, 83 goats in 10 agriculture holdings. In addition to livestock, one holder raised one poultry farm and one raised 50beehives. The sample in Jericho and Al-'Auja showed that 23.5% of agriculture holders who owned livestock have that affecting their decision of types of crops cultivated. Also, 82.4% of livestock owners indicated that there were no positive or negative impacts of raising livestock on agricultural production.

CLIMATE CHANGE

The sample results showed that 96.7% of the agriculture holders have noticed significant changes in weather conditions in Jericho and Al-'Auja over the last 10 years. 96.1% of them indicated that there were negative impacts of weather conditions on the agricultural sector in Jericho and Al-'Auja (figure 18).

Figure 18: Main negative impacts of weather condition on Agriculture Sector in Jericho and Al-'Auja



The previous figure showed that the main negative impact of weather conditions in Jericho and Al-'Auja was drought; which according to the sample holders is a result of the decrease in the amount of rainfall on one hand, this in addition to Israeli occupation and control over the main water springs and sources, especially in Al Auja locality, which leads to the inability of farmers to cultivate their land, which increases agriculture lands vulnerability to drought as a result of rising temperature. In addition to drought, the agriculture holders noticed an increase in the amount of plant diseases during the last years.

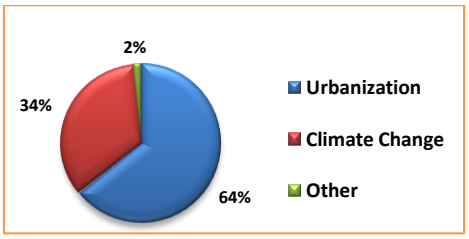
As for the changes in the agriculture seasons during the last 10 years, 90.8% of Jericho and Al-'Auja sample agriculture holders indicated that there was a change in the agriculture seasons, of which 50% indicated that the changes was a result of Israeli occupation restrictions over water sources in Jericho and Al Aghwar Governorate, which led to drought conditions in the area, while 31.5% of the holders indicated the changes was a results of climate change and high temperature.

As for the impact of increased temperature on the agricultural production, 97.4% of the sample agriculture holders stated that the increase of temperature had negative impacts. The main negative impacts can be summarized according to the holders in: drought and increasing the need for water for irrigation, crop damage and delay in agricultural seasons according to the availability of water.

In general, 92.8% of the Jericho and Al-'Auja sample holders indicated that the area cultivated with different crops

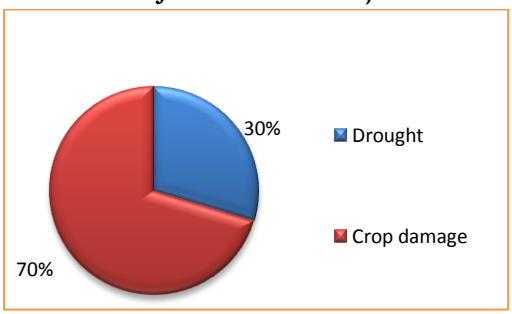
decreased along time. 94.7% of the them noticed change in land uses during the last 10 years, where 64.2% indicated that the change is a result of urbanization problem and population growth and 34.4% indicated that the reason is climate change (drought) (figure 19).

Figure 19: Reasons of changes in Land Use over the last 10 years in Jericho and Al-'Auja



For the main vegetables crops types, 92.1% of the sample agriculture holders indicated that there was a change in the type of vegetables cultivated over the last 10 years, of which 70.4% indicated that the change was due to crop damage by plant diseases, frost and wind, and 30% indicated that the change was a result of climate change (drought) and the increase of temperature (figure 20).

Figure 20: Main causes of changing vegetable crops types over the last 10 years in Jericho and Al-'Auja



Also, the sample holders gave an example of the changes in type of crops such as: planting maize instead of cucumber and tomatoes, and planting fruit trees such as banana instead to vegetable crops.

Annex 1: Area of Vegetables Crops in Jericho and Al-'Auja Sample 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
Broad bean	10	45	2	3	12	48
Cauliflower	154	786	49	185	203	971
Cucumber	98	340	34	129.5	132	469.5
Garlic	4	17	-	-	4	17
Hot Pepper	37	123	10	26	47	149
Jaw's Mellow	75	897	73	867	148	1764
Kidney Bean	44	115	19	51	63	165.5
Lettuce	7	40	-	-	7	40
Maize	76	783	30	323.5	106	1106.5
Eggplant	123	699	55	279	178	977.5
Muskmelon	23	208	12	103.5	35	311.5
Onion	9	67	-	-	9	66.5
Paprika	48	174	15	63	63	237
Parsley	2	3.5	-	-	2	3.5
Potato	1	1	-	-	1	1
Red Cabbage	1	15	1	15	2	30
Snake cucumber	4	14	1	3	5	17
Squash	105	805	45	299.5	150	1104.5
Tomato	140	798	55	303.5	195	1101.5
Watermelon	3	26	2	16	5	42
White Cabbage	135	721	47	202.5	182	923.5

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

Annex 2: Area of Vegetables in Jericho and Al-'Auja Sample by Type of Irrigation, type of crop and type of protection

Type of Crop	Open Rainfed	Open Irrigated	Type of protection		Production Total (tons)
			Tunnels	Plastic House	
Broad bean	-	48	-	-	93
Cauliflower	-	971	-	-	2413.25
Cucumber	-	256.5	-	213	2315.5
Garlic	-	17	-	-	32
Hot Pepper	-	124	3	22	491.2
Jaw's Mellow	-	1764	-	-	4246
Kidney Bean	-	72.5	2	91	420.5
Lettuce	-	40	-	-	63
Maize	18	1088.5	-	-	1611.95
Eggplant	-	904.5	5	68	5585.4
Muskmelon	-	311.5	-	-	1802
Onion	-	66.5	-	-	115
Paprika	-	189	4.5	43.5	452.38
Parsley	-	3.5	-	-	4
Potato	-	1	-	-	5
Red Cabbage	-	30	-	-	90
Snake cucumber	-	17	-	-	48
Squash	-	1104.5	-	-	3729.7
Tomato	-	978	6	117.5	5695.5
Watermelon	-	42	-	-	274
White Cabbage	-	923.5	-	-	2708
Total	**18**	**8952.5**	**20.5**	**555**	**32195.38**

Area in Dunum

Annex 3: Distribution of vegetables crops production in Jericho and Al-'Auja Sample

Vegetable	Local Market %	Export %	Damaged %	Household consumption and gifts %
Broad bean	100	0	0.0	0
Cauliflower	98.4	0	0.2	1.4
Cucumber	98.5	0	0.1	1.4
Garlic	100	0	0	0
Hot Pepper	100	0	0	0
Jaw's Mellow	97.6	0	0.8	1.6
Kidney Bean	99.7	0	0	0.3
Lettuce	100	0	0	0
Maize	99	0	0.3	0.8
Eggplant	99.3	0	0.1	0.6
Muskmelon	99.8	0	0.2	0
Onion	96.7	0	0	3.3
Paprika	99.7	0	0	0.3
Parsley	100	0	0	0
Potato	100	0	0	0
Red Cabbage	100	0	0	0
Snake cucumber	100	0	0	0
Squash	98.5	0	0.4	1.1
Tomato	99.1	0	0.2	0.7
Watermelon	100	0	0	0
White Cabbage	99.5	0	0	0.5
Total	**99.3**	**0**	**0.1**	**0.6**

Annex 4: Number, area, production and distribution of Fruit trees in Jericho and Al-'Auja sample

Type of crop	Number of Agriculture Holdings	Irrigated trees		Production (Tons)	Production Distribution (%)			
		Number	Area		Local Market	Export	Damaged	Household consumption
Banana	9	10	140	724	98.9	0	0	1.1
Date	6	80	120.5	602	100	0	0	0
Bomaly	1	6	6.5	14.5	100	0	0	0
Grape	1	80	10	80	100	0	0	0
Lemon	6	10	11.5	24	90	0	1.7	8.3
Orange	6	20	11.5	31.5	90	0	0.8	9.2
Total	**29**	**206**	**300**	**1476**	**96.5**	**0**	**0.4**	**3.1**

Area in Dunum