

1985

Possibilities of agricultural development on the West Bank by winter tomatoes

Odeh Shehadeh Alzaghmory
Iowa State University

Follow this and additional works at: <https://lib.dr.iastate.edu/rtd>

 Part of the [Agricultural and Resource Economics Commons](#), [Agricultural Economics Commons](#),
and the [Economics Commons](#)

Recommended Citation

Alzaghmory, Odeh Shehadeh, "Possibilities of agricultural development on the West Bank by winter tomatoes" (1985). *Retrospective Theses and Dissertations*. 16531.
<https://lib.dr.iastate.edu/rtd/16531>

This Thesis is brought to you for free and open access by the Iowa State University Capstones, Theses and Dissertations at Iowa State University Digital Repository. It has been accepted for inclusion in Retrospective Theses and Dissertations by an authorized administrator of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.

Possibilities of agricultural development on the West Bank by winter

tomatoes

by

Odeh Shehadeh Alzaghmory

A Thesis Submitted to the
Graduate Faculty in Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE

Department: Economics
Major: Agricultural Economics

Signatures have been redacted for privacy

Iowa State University
Ames, Iowa

1985

1523020

TABLE OF CONTENTS

	PAGE
DEDICATION	ix
ABBREVIATIONS AND DEFINITIONS	x
INTRODUCTION	1
Objectives and Hypothesis	1
Sources of Data	3
THE WEST BANK	7
A Brief History of the West Bank	7
Property rights	11
The Jordan Valley	12
THE STUDY AREA	15
TOMATO PRODUCTION ANALYSIS	23
Land Tenure System	23
Tomato Production	30
Supply of Production Inputs	34
Recent Technological Developments in the West Bank Jordan Valley	47
Landlord-Merchant Role	52
Tomato Production Problems	57
TOMATO MARKETING ANALYSIS	64
The Marketing System	64
Marketing Agents	66
Tomato Marketing Services and Margins	67
Marketing Problems	77

THE JERICHO COOPERATIVE FOR MARKETING AGRICULTURAL CROPS	86
Services Provided to the Members	86
Survey Data about Roles Which the Agricultural Cooperatives Should Play	88
CONCLUSIONS	91
Intensive Opportunity	93
Local Substitutes for Imports	94
Production Input Costs	94
Marketing Costs	95
Tenure Systems	95
ACKNOWLEDGEMENTS	97
APPENDIX A: WEST BANK AGRICULTURE AND WATER RESOURCES	98
Geographical Background	98
Agriculture in the West Bank Economy	101
Population and Labor Force	102
Distribution of Agricultural Land Holdings	104
Land Use	105
Water Resources	108
The Aquifer System	114
Agricultural Production	129
Marketing	132
APPENDIX B: JORDAN VALLEY AGRICULTURE	139
Soil	139
Land Use	140
Population and Work Force	141
Land Holdings Distribution	144

Water Resources in the Jordan Valley	145
The Israeli Settlements in El-Ghor	156
Agricultural Production	159
APPENDIX C: AGRICULTURAL COOPERATIVES ON THE WEST BANK	164
The Goals of the Cooperative Movement	165
APPENDIX D: THE QUESTIONNAIRES	177
Farmer Questionnaire	177
Agricultural Cooperative Questionnaire	184
Leader Village Questionnaire	188
BIBLIOGRAPHY	192

LIST OF TABLES

	PAGE
TABLE 1. Artesian wells in Zbydat/Marj Na'ja area in 1980	20
TABLE 2. Landlords in Zbydat	24
TABLE 3. Share cropped and cash rented land in relation to owned land	29
TABLE 4. Tomato crop yield in Zbydat and selected neighboring 'regions by method of irrigation (1979/1980) yield : tons/dunum'	30
TABLE 5. Fertilizers used in the East Jordan Valley	37
TABLE 6. Prices of Plastic According to the Tenure System kersh/kg	39
TABLE 7. Average yield	48
TABLE 8. Decision making for landlords and farmers by percentage . .	54
TABLE 9. Cost of tomato production per dunum	59
TABLE 10. Tomato inputs by tenure	60
TABLE 11. Tomato input prices by tenure	60
TABLE 12. Total inputs cost per dunum by tenure	61
TABLE 13. Tomato production problems	62
TABLE 14. Constraints of expanding tomato production	63
TABLE 15. Marketing margins for tomato per kilogram in 1980	76
TABLE 16. Tomato sold in West Bank and Jordan by tenure	82
TABLE 17. Tomato marketing costs	83
TABLE 18. Marketing cost per dunum by tenure	84
TABLE 19. Gross and net revenue for tomatoes by tenure groups	84

TABLE 20. Agriculture in the West Bank economy at its prices	102
TABLE 21. Population aged 14 and over	103
TABLE 22. Distribution of agricultural land holdings	105
TABLE 23. Distribution of irrigated and cultivated land in Palestine in 1978-79	107
TABLE 24. Distribution of farm land in the West Bank	108
TABLE 25. Underground water resources in the West Bank (1978)	117
TABLE 26. Distribution of the Arab Farmers Wells and Their Productivity in the West Bank	119
TABLE 27. Distribution and productivity of the Israeli Farmers wells in the West Bank 1979	121
TABLE 28. Distribution of water consumption in the West Bank and Israel	122
TABLE 29. Irrigated land (1977/78) in the West Bank	123
TABLE 30. Distribution of Agricultural Production in the West Bank	132
TABLE 31. Distribution of West Bank Export	135
TABLE 32. West Bank Export to Jordan By Main Items	136
TABLE 33. West Bank Imports Origin	138
TABLE 34. Age by village (1983)	143
TABLE 35. Work sector by village	144
TABLE 36. Form of land holdings and total dunumage by agrarian class	147
TABLE 37. The amount of water that could be available in El-Ghor .	148
TABLE 38. Used water in the West Bank Jordan Valley in 1980	149
TABLE 39. The major springs in the West Bank Ghor	153
TABLE 40. The use of springs in West Bank Ghor	153
TABLE 41. Wells in the West Bank Ghor area	156

TABLE 42. The Israeli settlements in El-Ghor up to 1982	158
TABLE 43. Total cultivated land, production in the West Bank and the Jordan valley Percentage sharings	159
TABLE 44. Agricultural production in the West Bank Jordan Valley .	160

LIST OF FIGURES

	PAGE
FIGURE 1. Map of Palestine	8
FIGURE 2. Map of West Bank Administrative Districts (Istanbouly et al. 13, p. 19)	9
FIGURE 3. Different areas in the Jordan Valley (Abu Arafah, 1, p. 17)	13
FIGURE 4. The Study Area	16
FIGURE 5. Division of labor and related work in Zbydat (Tamari and Giacaman 23, p. 46)	44
FIGURE 6. Annual Cycle of Tomato Production (Tamari et al. 23, p.49)	53
FIGURE 7. Agricultural Areas of the West Bank (Istanbouly et al. 13, p. 32)	99
FIGURE 8. West Bank Administrative Districts with the Agricultural areas (Istanbouly et al. 13, p. 22)	106
FIGURE 9. Climate Areas Of the West Bank (Istanbouly et al. 13, p.23)	110
FIGURE 10. Rainfall in the West Bank (Istanbouly et al. 13, p. 17)	113
FIGURE 11. Hydrology of the West Bank (Schwarz, 19, p. 86)	115
FIGURE 12. The Arab Villages and Israeli Settlements (Abu Arafah, 1, p. 56)	142
FIGURE 13. Agricultural land in the West Bank Ghor (Abu Arafah, 1, p. 39)	146

DEDICATION

To the memory of my father
Shehadeh Alzaghmory who
did not live long enough to
see the completion of this
work and whose love, wisdom,
and sacrifices were my guide
in all the way. To him I
dedicate this.

ABBREVIATIONS and DEFINITIONS

NA	: Not available
mm	: Millimeter
m	: Meter
km	: Kilometer
kg	: Kilogram
mcm	: Million cubic meter
Ghor	: The West Bank Jordan Valley
JD	: Jordanian Dinare
Kersh	: 1/100 JD
Fils	: 1/1000 JD
LDC	: Less Developed Countries.
IS	: Israeli Shikel
IL	: Israeli Lira

INTRODUCTION

This study attempts to determine the unrealized economic potential, to produce and market winter tomatoes, with existing agricultural resources of three Arab villages ZBYDAT, MARJ NA'JA, and JEFTLIK on the occupied West Bank. The potential economic contribution and limitations of cooperatives in collective purchasing and group marketing is also assessed. There is little opportunity to increase the total value of agricultural production but considerable potential for increasing sharecroppers levels of living by lowering input costs and reducing tomato marketing margins. Market potential is limited on the West Bank. There is little prospect that the villagers will gain more access to markets in Israel. Access to the Jordan market is residual and re-export opportunity from Jordan is seasonal and extra handling costs are a barrier. Water available for irrigation is small now than in the past and will be smaller in the future. However given the low water requirements of winter production feasibility of expanding winter tomatoes is not limited by water.

Objectives and Hypothesis

This study is undertaken in order to fill the knowledge of the Jordan Valley agricultural development potential and our knowledge of potential of cooperatives to contribute to development. The general objective of the study is to determine the production and market capacity of Jordan Valley agriculture and analyze and compare the

alternatives for Arab agricultural production in the West Bank Jordan Valley. More specific objectives are:

1. To show the possibilities and obstacles faced by the agricultural cooperatives as an alternate source of the services now provided by the landlord-merchants.
2. To describe and analyze the flow, destination and cost of winter vegetable marketing, including export of vegetables and to identify possible solutions to their marketing problems.
3. To explain the value and limitation of the ground water resources for irrigation by different periods in three villages.
4. To show the competition for water and markets between the Arab residents and the Israeli settlements on the West Bank.

We expect the study to confirm the following hypothesis related to the objectives:

1. H0: Merchant-landlords are providing several services to sharecropping farmers.
2. H0: To contribute to development, cooperatives must provide each service more cheaply and effectively than the existing merchant-landlord system.
3. H0: Some cooperatives will be unable or unwilling to compete successfully with the merchant-landlord. Especially difficult for cooperatives to provide is Permission to

export, and land to the landless. Some cooperatives will not compete because the board of directors are beholden to the landlords.

4. H0: The access to Jordan and Israeli markets is unpredictable and limited. These factors constraining development, reducing the return to resources, and increase the variability of the return to production resources.
5. H0: Water resources are a limiting factor, especially during key seasonal periods. Over time the trend in water supply is negative and can be projected to imply less total production as available water is reduced in critical months.

Sources of Data

1. Literature.
2. 1985 survey of the three villages.
3. Israeli statistical data about the West Bank for different years.

Survey

The sample The study is based on a sample of 30 farmers from the Jordan valley area (Ghor area). These farmers were randomly selected from a list of the household names in three villages: Jeftlik, Zbydat, and Marj Na'ja. The list of households was obtained from the Research Center at Birzeit University in the West Bank. The sample constructed by selecting every fourth name in the list. The first name

was selected randomly. The number of farmers chosen in each village is according to the number of households in each village as the following:

1. Jeftlik has 180 households, 10% of them were chosen which is equal 18 households.
2. Zbydat has 22 households, 27% of them were chosen, which equal 6 households.
3. Marj Na'ja has 22 households, 27% of them were chosen, which equal 6 households.

Weighted tabulation was done in order to adjust for the different percentage sampling rates taken from each village. The weight tabulation is used to weight cases differently for which some substractum has been over or undersampled. Weights can be applied to obtain population estimates, weight the sample upto population size for reporting purposes, or to replicate an example from a table or other aggregated data. In this study weight tabulation is used to weight the sample up to population size. By weighting each observation inverse of the sample rate, the estimated equalled the total households changed for each village and became as Jeftlik 180 household, Zbydat 22 and Marj Na'ja 22, which equal the total household number of each of them.

The questionnaires Three questionnaires were used, one for the farmers one for the leader of the village ("Mokhtar" in Arabic) and one for the agricultural cooperative. Each was conducted in Arabic, translated to English, and is included in the Appendix D. The questionnaires were sent to West Bank. A friend with B.A. degree in

Sociology with previous experience in survey conducted the interviews and completed the questionnaires.

The major questionnaire to the farmers, asked general questions, also about land use, tomato production, inputs used, input cost, marketing costs, decision making and the lease relationship between the farmers and the merchant-landlord, services provided by the cooperative, and production methods used for tomatoes.

The questionnaire for the village leader was conducted in one of the three villages. This questionnaire includes questions about total agricultural production, cultivated area, available water sources, and agricultural, and marketing practices.

The questionnaire for the Jericho cooperative for marketing agricultural crops asked about cooperative's objectives, the services it provided, the board of directors, its management, and the limitations and problems that face it.

Statistical data

Another important source of data is Israeli Statistical Abstracts relating to the West Bank and Gaza Strip for the period between 1967-1982, and the Israeli quarterly statistical publication about the occupied territories. Some other statistical data were obtained from the Arab Thought Forum Survey of 1983, which I shared in collecting for the Northern and Central sides of the Jordan Valley.

Studies and reports

The remaining sources of information are studies, books, and reports about the West Bank in general and about the Jordan Valley specifically. These resources were either found at Iowa State University or brought from the West Bank and Jordan.

THE WEST BANK

A Brief History of the West Bank

The area referred to in this report as West Bank, is the part of the Palestinian land seen in Figure 1. This land has been occupied and controlled by the Israeli military since May 1967. The West Bank is about 5.7 million dunums or 1.4 million acres (or about the size of four Iowa counties) divided into eight major administrative districts: Jeneen, Tolkarem, Rammallah, Jericho, Jerusalem, and Hebron (see Figure 2). About 747.5 thousand Palestinians live in the West Bank.

During the 18 years of military occupation, the West Bank economy has been separated and experienced economic isolation. West Bank products have only limited access to Israeli and Jordanian markets and direct international trade with other nations is precluded. The area has experienced relatively limited development compared to neighboring Arab countries. The West Bank has changed towards many more subsistence farmers, and fewer manufacturers and services. Development investment has been near zero. Many West Bank residents emigrated to other countries to escape the military occupation and obtain more economic and political freedom. Commercial Arab farms and West Bank factories after 1967 suffered severe economic losses due to lack of market access for products and shortage of foreign exchange to buy inputs. The small aggregate market size and the low average income of the West Bank residents prevents the West Bank economy from effectively and fully

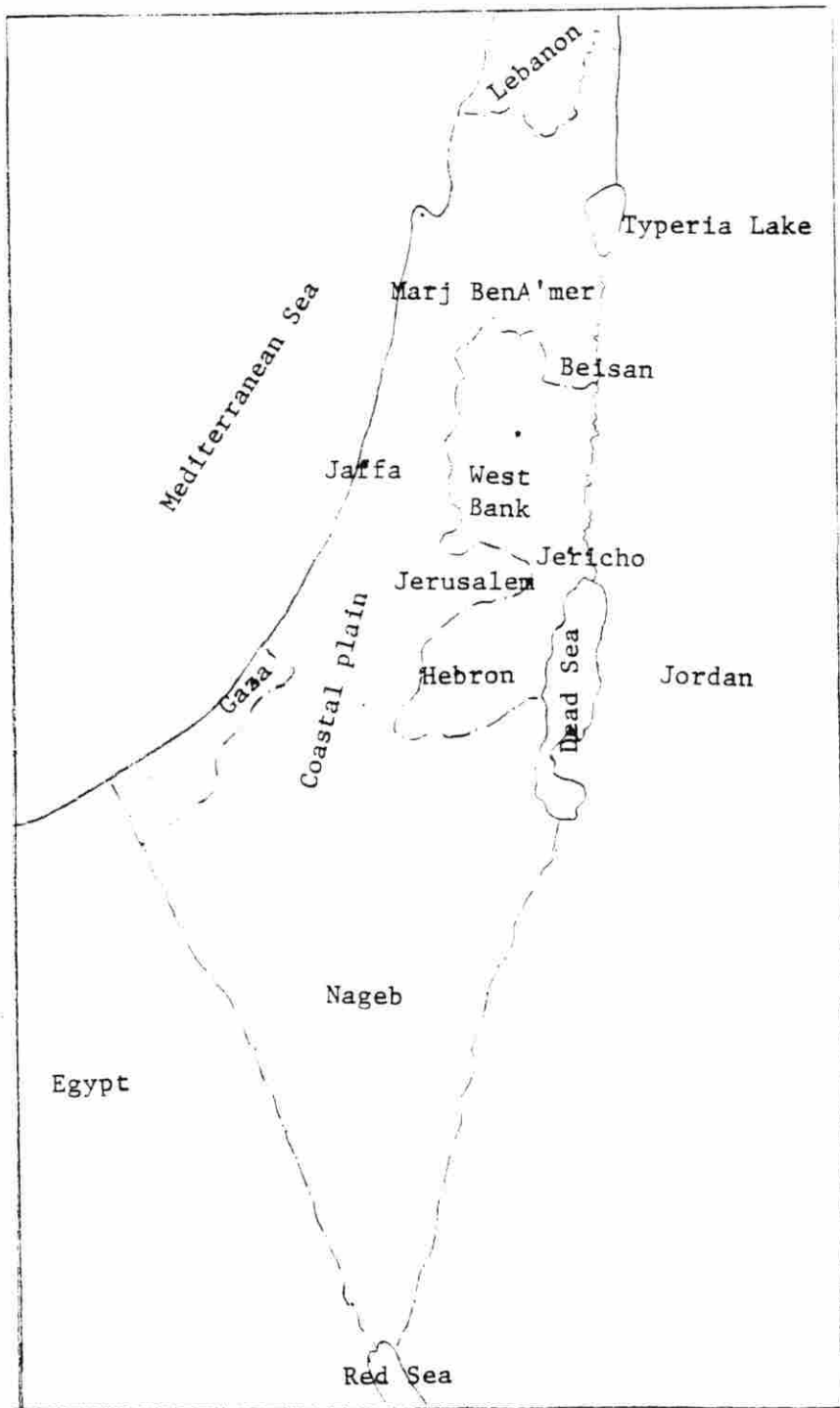


FIGURE 1. Map of Palestine

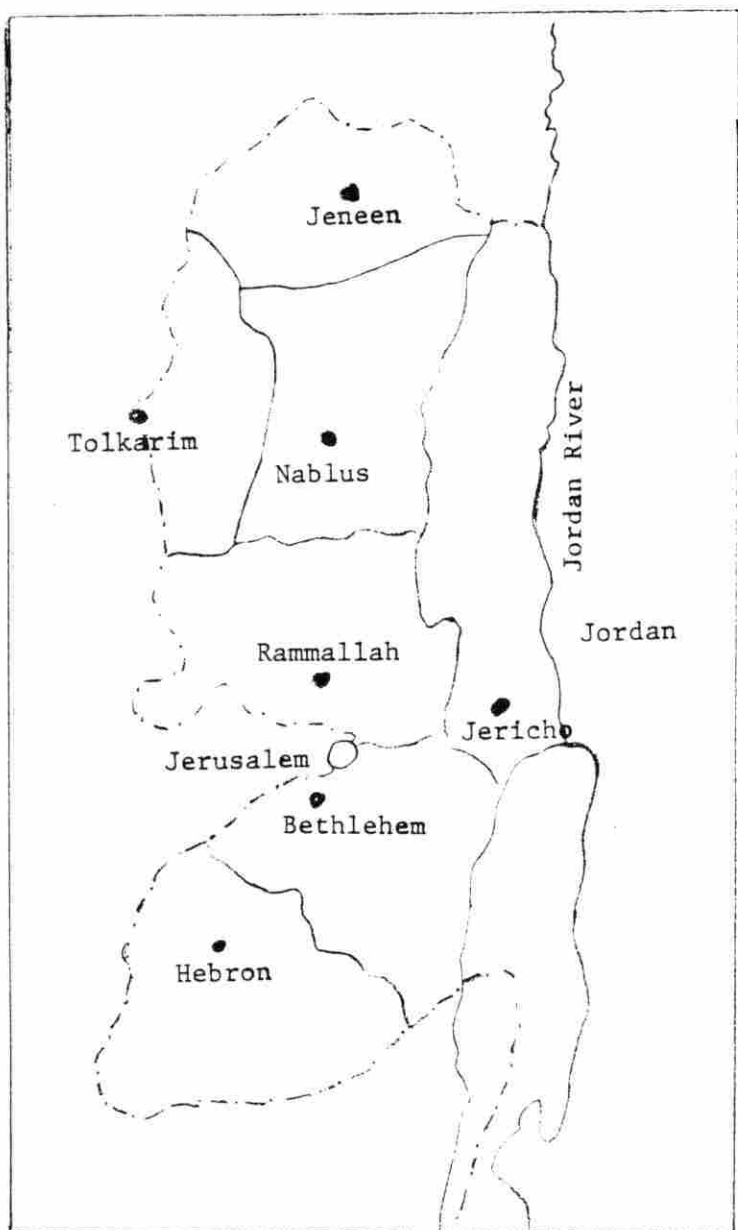


FIGURE 2. Map of West Bank Administrative Districts (Istanbouly et al. 13, p. 19)

employing its people, land, and water resources. Better employment and entrepreneur opportunity outside the West Bank has encouraged many Palestinians to emigrate or work temporarily in other countries. Many of those who remain on the West Bank resist the attraction of emigration by hoping for economic and political freedom in the future.

During the Israeli military occupation, large tracts of Arab farm lands have been confiscated for use by the military occupation. The Israeli occupation has also built settlements and new towns in the West Bank. As a result, part of the water and land has been reallocated from Arab commercial farming to Israeli agriculture, housing, industrial, and military uses. Construction materials and industrial raw materials for new Israeli industrial settlements on the West Bank usually come from Israel, and the products are shipped to Israel. About 200-250 Israeli "settlements" are spread over the West Bank's six administration districts.

The Israeli settlements have full, access to both input and product markets of Israel and preferred interest rates and receive subsidies as a result Arab West Bank economic activity is less well capitalized and grows at a lower rate. The occupation has created a dual economy which distorts natural development and creates inefficient use of resources. On the other hand, the occupation seems to have strengthened nationalism of some people and made them more willing to stay, to struggle and survive on the West Bank, and to gain their freedom and their self-determination.

Prior to the war, the economy of the West Bank had been integrated into the economy of the hashemite kingdom of Jordan. The inhabitants were engaged primarily in agriculture, services and trade with other arab countries. The 1967 war caused a sharp decline in the level of economic activity. After the war, economic isolation limited opportunity to work and invest. The uncertainty and unstability after the war resulted in very few new Arab investments. There is a stagnation, decline and slowdown in economic activity on the West Bank.

The emigration of about ten percent during and following the war and the reduced income per capita resulted in further reduction in the West Bank and the size of the economy and of the labor force (for more details see Appendix A).

Property rights

In general individual property rights derive from the state or government in power. If conquest takes place the new government may not continue all former property rights. "The British colonolization issued a law in 1920 that allowed the Jewish to buy the land that was registered under the Turkey state name"². After the 1948 war between Israel and the Arabs in Palestine, the Israeli occupation terminated the property rights of the Palestinians who were not resident on their property (after forced to leave their land and houses) and Israel terminated the property rights of the British mandate.

Most Palestinians, who owned the property in what is called now Israel, still have property right certificates from the British or Palestinian which prove their ownership of property (land, houses, and water resources) now located in Israel. In 1952, the West Bank came under the rule of Jordan, the Palestinian property rights in the West Bank were registered in the Jordanian Land Department.

Most of the West Bank land owned by individuals, and the state properties, are that land which registered under the name of the state such as government departments, prisons, military areas etc. "After the Israeli military occupation to the West Bank in 1967, the Israeli occupation considered all of the state property and the unused land for the last ten years as state property"².

International laws established by a Geneva convention in 1949 says the occupying army should give the people of any occupied country the rights to continue ownership and protect their property rights under the occupation.

The Jordan Valley

The Jordan Valley is the low lying area extending from just South of Tyberia lake down to the Dead Sea. It is narrow from East to West covers part of two nations Jordan and Palestine (see Figure 3). The area in which we are interested (2 & 3 on the map) is the West portion of the Jordan Valley.

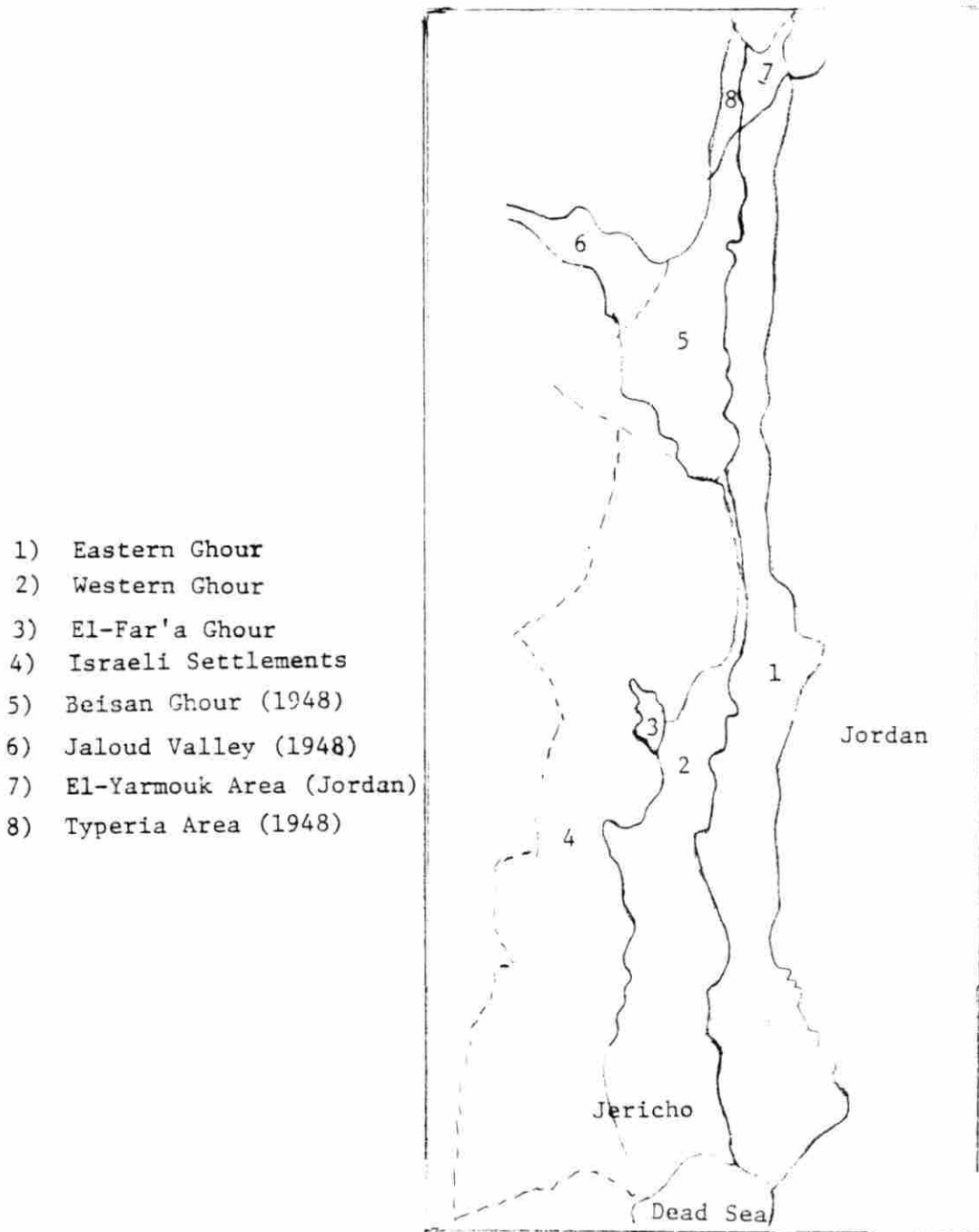


FIGURE 3. Different areas in the Jordan Valley (Abu Arafa, 1, p. 17)

- (1,7) are in the Jordan Ghour
 (2,3,4) are in the West Bank Jordan Valley
 (5,6,8) are occupied since 1948

In this area (West Bank Jordan Valley), our study is at three typical villages which are called Zbydat, Marj Na'ja, and El-Jeftlik. The Jordan Valley is a flat land. The walls of the valley are like mountains to the east and in the west. The Jordan Valley lies below Amman and below Nablus, and considered the lowest agricultural area on the earth, and about 392 m below sea level, at the surface of the Dead Sea. The valley slopes gradually lower from north to south, and gently upward away from the Jordan River towards the highlands east and west.

The Jordan River meanders the whole length of the Valley, and is about 18-45 meters wide depending on the rainfall. The water is very salty. The area immediately around the river from the two sides is called El-Zour, which is between 360 - 1300 m in width. The next area further from the river than El-Zour is called El-Ghor which is between 6-20 km wide. Between these El Zour and El Ghor, there is a small sandy mountain, about 9 meter high and wide which is not useful for planting. El Ghor is the important agricultural land and is bounded to the East and the West by the highlands which rise steeply from the valley floor.

The West Bank Jordan valley is an important area contributing to the economic activity. The availability of water resources, climate, and nature of the area helped the Jordan Valley to be an important region. On the other hand, the location of the Jordan valley (borders of West Bank and Jordan) considered another major political importance (for more details see Appendix B).

THE STUDY AREA

The three villages of this study area are located in Ghor Al-Far'a, part of the West Bank Jordan Valley (see Figure 8). Ghor Al-Far'a is considered the central Ghor of the West Bank Jordan valley. Few Arabs are living in this area (about 1,700), and it is very close to the border area with Jordan.

The three villages which were chosen for this study are Jeftlik, Zbydat, and Marj Na'ja (see Figure 4). Each village will be discussed separately in this section:

Jeftlik

This village is the biggest one in terms of population, area and number of sharecropper farmers. The total population in this village varies from one year to another and from one season to another in the same year. Sharecropper farmers come to this village from the other surrounding areas, especially the Nablus area, to work for one or two seasons and then return to their villages. The landlords are few in number and the big landlords are from Nablus. The big landlords control most of the land. In addition, the big landlords control the local markets and sometimes effect the Jordan markets. They also provide the farmers with inputs and services at high prices.

The total land area for Jeftlik was limited by the military occupation in 1984 to 15,000 dunums. It receives about 200 mm of annual rainfall, which is not enough for agriculture so it depends on

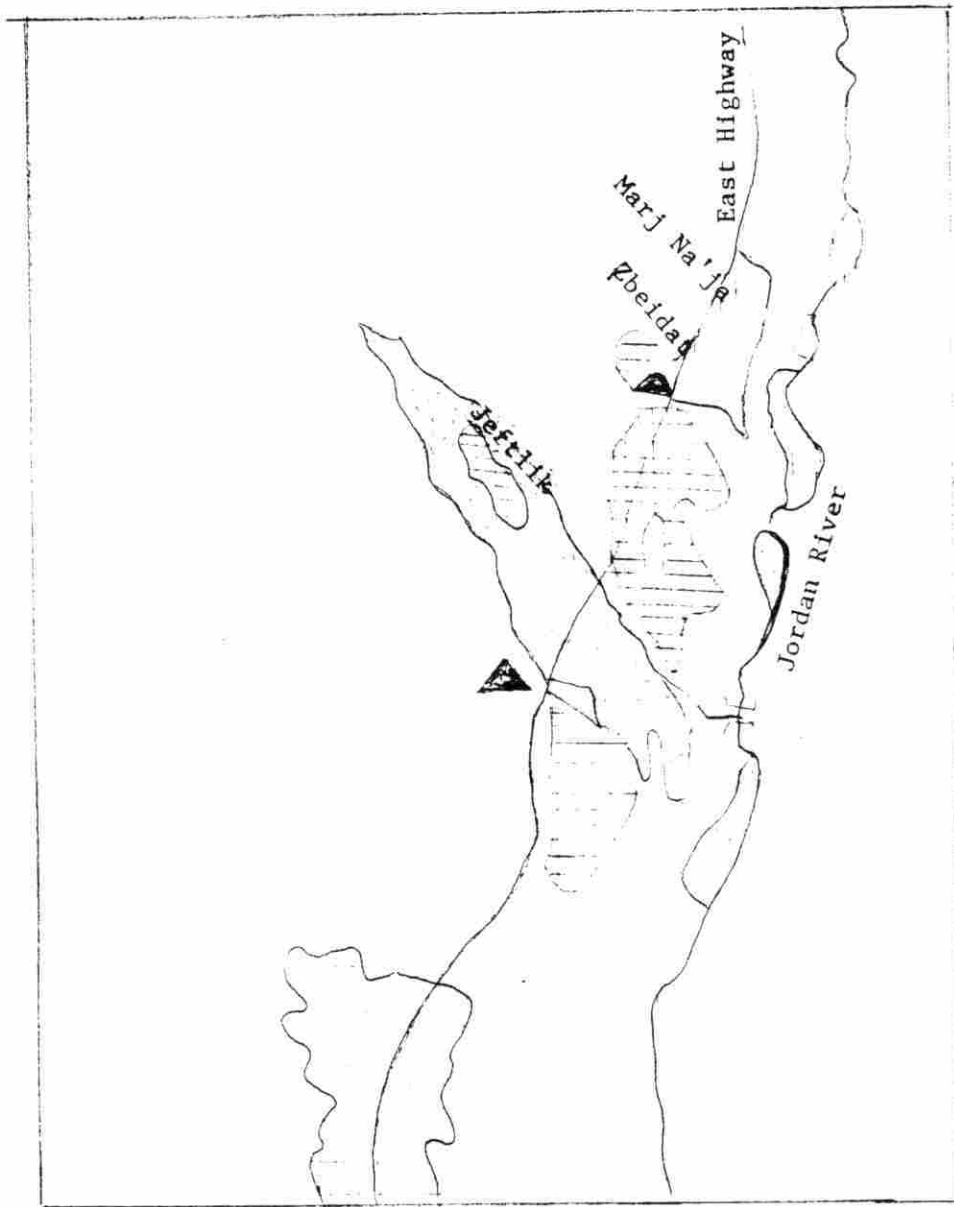
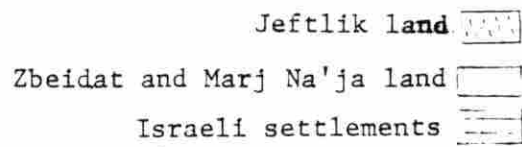


FIGURE 4. The Study Area



ground water resources. Most of the land is irrigated. Jeftlik has 15 wells which are owned by the big landlords and also uses two springs (Ein Shibli and Ein Meska) for irrigation water. Production from the 15 wells is limited by the military occupation authorities like the other Arab farmers wells in the West Bank. Military permission is necessary for the farmers to use the water. Annual water production from the springs depends on the annual rainfall over the eastern heights of the West Bank. The rate of spring water loss is very high because the water flows over the ground and part of it is absorbed by the ground. The channels used for distributing the water are also very old and in bad condition, and the rate of evaporation is very high due to the hot temperature in the summer. The water is distributed to the farmers for both agriculture and household use by these old channels. Each Arab farmer receives water one day a week. The total amount of water distributed to the landlords is according to the size of their landholdings and their willingness to share in the cost. Some big landlords have built small lakes where they collect their own water and save it for other periods. Few of the big landlords in this village are native residents.

Three Israeli settlements were built over this village's land up to 1980, Meshor'a Shlomo Seion, and Yafet. A large part of the cultivated land was confiscated by the military occupation authorities for the use of the Israeli settlements.

The Arab farmers are living in mudhouses, under very bad conditions and with the poorest available facilities. Landlords are supposed to provide the share cropper farmers who come to Jeftlik in the agricultural seasons with better facilities.

According to this study, 36% of the share cropper farmers were provided with houses by the landlords, and none of the farmers were provided with other facilities like a kitchen, electricity and water. Small electric generators are used to supply the houses with electricity. There is a preparatory school in the village, but for high school (secondary) the students have to go to Nablus. There is also a one room clinic in the village open once a week to provide the whole village with medical services. Transportation is very limited and very expensive, one bus visits the village twice a day from Nablus (morning and afternoon).

Finally, the most common type of farming in Jeftlik is sharecropping and according to the farmers and the village leaders this village faces many problems relating to agriculture, housing, education, health, transportation and shopping. The farmers cannot plant more tomatoes because of land confiscation, limited water resources, military permission, marketing and cost of inputs.

Zbydat

Zbydat is the name of both the village and the tribe of people living there. This tribe was forced to leave its land in the 1948 war and to leave the land in Beir-al Sab'a region (see Figure 1). Zbydat is

about 20 miles north of Jericho and is located on the west side of the highway from Jericho to Beisan. The Jordan government gave Zbydat farmers 500 dunums in 1961 with promise that ownership titles would be given to them after 5 years if they can prove continued cultivation. This land was divided between the families according to the number of able males within each family. After the 1967 war, the military occupation did not recognize the previous Jordanian agreement and considered them as renters. "The Israeli government refused to recognize the agreement concluded between the Zbydat community and the Jordan government where by the 500 dunums were to be registered in the names of Zbydat farmers in the summer of 1967. However, their defacto possession of the land was granted by the military government against the continued payment of rent for the use of the artesian wells, the houses, and the remaining dunums under their control"²⁴.

At the same time some of the Zbydat farmers are sharecroppers too for the land close to their villages. After the 1967 military occupation confiscated 260 dunums of their land for Argaman settlers, the closed the remaining area for security purposes (see Figure 3). Two Israeli settlements were built over Zbydat land, Argaman and Mahoula.

Water resources in Zbydat are very limited as annual rainfall is very low, about 150 mm, and there are no springs and only one artesian well. Table 1 shows the artesian wells in the Zbydat/ Marj Na'ja area.

The water production in the village well is limited to 23,000 mcm per year. The water is distributed to the farmers through tubes every

four days according to the size of their land holdings. The cost of water is charged according to the number of hours pumped. Tomatoes are the most produced crop in Zbydat, especially in the winter season.

TABLE 1. Artesian wells in Zbydat/Marj Na'ja area in 1980²³

Owner	no. of wells	dunums irrigated	of which under drip	% under drip
Suleiman Saleh	1	784	184	65
Zbydat farmers	1	311	295	94
Jamil Abdul Fattah	1.5	67	50	74
Badic Yunis	1	60	40	67
Abu Jarrar	1.5	100	60	60
Marj Na'ja farmers	2	400	125	31
Total	8	1222	754	62

Until early in the 1980s, the village houses were built from mud bricks and straw. The Mennonite Central Committee, however, helped farmers to get loans from different resources to build new cement houses. There are two local schools in Marj Na'ja, about 1 mile north of Zbydat, which are used by students from both villages. Farmers go to Nablus for shopping and medical treatment by a daily bus. The total population of the village is about 350 with 22 families.

Merchants provide Zbydat farmers with agricultural inputs and marketing services. The local markets are controlled by these

merchants, part of whom are landlords at the same time. Lack of capital forces these farmers to have this dual relationship with the merchants even though the merchants charge the farmers high costs and commissions.

Marj Na'ja

The name Marj Na'ja is used for both the village and the area, included the Zbydat village. The population of the Marj Na'ja village was forced to leave their land and homes in the 1948 war in Al Muthalth (West of Jeneen administrative district) (see Figure 1). The families of Marj Na'ja were given about 1,000 dunums by the Jordanian government during the early 1950s. After the 1967 military occupation, 300 dunums of the land was confiscated and part of it was closed for security purposes. Most of the farmers in Marj Na'ja are considered small owners, some are sharecroppers. Tomatoes were the first produced crop in Marj Na'ja. The total population of the village is about 275. Their houses were built in the 1950s by UNRWA.

Water resources in Marj Na'ja are as limited as they are in other villages in the Jordan valley. Annual rainfall is about 150 mm, which is not enough for irrigating and there is no spring water. There are two artesian wells in the village (see Table 1). Water is distributed to the farmer's land by tubes, each dunum gets 10 minutes of water. Each farmer shares in the cost of fuel, maintenance and labor for the two wells according to his use of water. The amount of water production from each well is limited by the military occupation and the farmers cannot use more than the limited amount of water, which is 40,000 cm per year.

There are two schools in Marj Na'ja used by both Marj Na'ja and Zbydat students. Farmers of Marj Na'ja, like Zbydat farmers, go to Nablus for shopping and medical treatment by a daily bus.

Merchants in Nablus, who control the markets, provide Marj Na'ja farmers with agricultural inputs and marketing services at high prices.

Finally, the three villages of the study area have many similarities, especially in both agricultural production and marketing problems. Different types of tenure systems in each village and yet, most of the farmers in the three villages sharecrop big landlord's land. Big landlords are from outside the village, usually from Nablus and Tobas, except in Jeftlik where there are a few native residents who own several hundred dunums. The social life of the residents of these three villages is the same. They have a very low standard of living with low education levels especially among the older people. Social services, especially health, are very limited and water resources are also very limited.

The characteristics of these three villages are not limited to this area, but extend to all of the West Bank and Gaza Strip villages, cities, and camps.

TOMATO PRODUCTION ANALYSIS

Land Tenure System

Ownership

The information about landownership in terms of either the distribution of landholdings or the size of the holdings, were obtained from the study. There were 38 farmers (about 17%) who owned land in the study area. While part of them were big landlords, some of them were considered small farmers who owned less than 20 dunums of land a piece. These small farmers were especially prominent in the Marj Najah village. Most of the Jordan Valley land owned by big landlords who usually live in the big cities, like Nablus, Jerusalem, and Tobas. Many of these big landlords have inherited their land from their fathers and grandfathers before. Some of these big landlords were considered native residents in the Jordan Valley villages. For example in Jeftlik there are few landlords who own hundreds of dunums and who at the same time rent land from other people.

While the study found that only 17% of the farmers own land, there were differences in regard to the size of their landholdings. Fifty-three percent of these owners owned less than 20 dunums, while 16% owned more than 100 dunums. The small owners were from Marj Najah and the big landlords were from Jeftlik. There were a few big landlords in Jeftlik who owned more than 100 dunums and at the same time they rent land to other people. They use small farmers to sharecrop the land. The small

owner farmers sharecrop and rent other land. Table 2 shows the situation of land ownership in one of the study areas, Zbydat.

TABLE 2. Landlords in Zbydat:1980²⁴

name of landlord	Total area owned in Zbydat	number of share cropper	of origin	current status
Suleiman Saleh	284	20	Tubas	Absentee landlord
Jamail Abdul fattah family	67	4	Beit Natif	Resident landlord
Adel Mfadi	34	1	Tubas	Absentee landlord
Hasan al-fahd	19	1	Tammoun	"
Abu Shammat	15	1	Tammoun	"
Badie Yunis	70	1	Nablus	"
Moshav Argaman	400	seasonal wage workers	Marj Najah Zbydat Nablus Makhroaq	Israeli Cooperative settlement

Most of the land in the Zbydat area is owned by absentee landlords (living outside the village).

Cash Rent

Cash rent or the so called leasing system, is not very common in the Jordan Valley, and except in the case of Zbydat village farmers (discussed in Appendix B), there are few cash renting farmers. Cash

rent agreements usually result in better conditions for the farmers than do sharecropping agreements. There is no sharing of crop involved, and farmers make the decisions by themselves unless a contract is issued. On the other hand, renting is more risky, especially when loss occurs. Also, the cash renter is in a situation similar to the sharecropper when he is under contract to commission agents.

The case of the Zbydat village is different since the farmers who are considered cash renters from the military occupation pay not only for the land, but also the house, and water resources (1 well). However, the cost of the rent is lower.

This study found that there were 56 cash renters in the study area. Twenty of them were big landlords who leased more than 100 dunums (100-350 dunums) and used sharecroppers for cultivation. Twenty-two of them were from Zbydat and rented land from the military occupation, while the remaining 14 farmers rented other peoples land for the annual cost of the cultivation. Cash rent farmers could be sharecroppers and owners at the same time.

The cost of the annual rent is different depending on the ownership of the rented land, time, and the area it is located in. According to this study, the cost of rent varies from 5 JD/dunum to 50 JD/dunum. The 22 farmers in Zbydat pay 5 JD/dunum and the other 34 farmers pay 40-50 JD/dunum.

Share cropping

The sharecropping system is a very old one in Palestine. The word "Muhasasa" which means sharecropping in Arabic is a familiar word for the Palestinian farmers. The conditions of sharecropping agreements were different from one period to another and from one crop to another, but in general there were some conditions which were common in most of the agreements. These include the sharing of the costs, the provision of land by the landlord and the provision of labor by the farmers, and the sharing of the harvested crop. The percentage share of the cost and revenue depends on the conditions of the agreement.

An annual contract is negotiated between the landlord and the farmer. Some of the conditions could be changed from one year to another, like rate of sharing both cost and return and services provided by the landlord. The following description of a sharecropping contract between the landlord and a farmer is found in the southern part of the West Bank Valley.

"A typical share-cropping family enters into an annual contract with the landowner. The contract stipulates that the land-owner or his agent will provide the farmer with a subsistence loan of advance of between JD 200-500, which will be repaid with interest, at the end of the cropping season. The interest is usually in the order of 10% for a six to nine month period. The whole operation is either financed by the owner or by a separate investor. The farmer provides all the labor necessary, while the owner or his agent provides plowing machinery, seeds, fertilizers, insecticides, crates, transportation and marketing. For these services, the owner or his agent sets the price, and the farmer cannot seek alternative services in the open market. All revenues and costs are split between the farmer and the owner in a 1:2 basis, i.e., the farmer gets one-third of the net revenues of the farm, after all expenses, as calculated by the owner or his agent. In case where the owner is different from the

financier-investor, the net revenues are split equally among the owner, financier and farmer. The contract is typically signed with two witnesses and a guarantor. It stipulates that if the subsistence advance is not repaid by the end of the season, the owner will confiscate any other property which the farmer has, unless the farmer renews the contract for another year. Should the farmer default on the provision of labor, the owner will farm the land at the farmer's expense. The farmer will also have to pay for any labor which he may have to hire at the harvesting time"⁸.

In this study, the division of the total cost and net return of marketed yield is 50:50 between the farmer and the landlord.

The problems of the sharecropping system in Palestine were discussed by Dr. Tamari as follows: "The dissolution of Arab landed classes during the 1948 war led to the dispersal of hundreds of thousands of peasants, who flocked to the West Bank, Gaza and Transjordan, and to the shattering of the system of patronage that existed until then. Nevertheless, the system of sharetenancy persisted. This phenomenon may be attributed to two main features of the new (dislocated) agrarian regime. One was the acquisition of vast tracts of irrigated land in the Jordan Valley (on both sides of the river basin) during the early sixties by resident and absentee landlords. In this endeavor, the landlords utilized the presence of refugee camps in the vicinity as recruiting ground for agricultural workers.

"A second factor was the migration of young members of peasant households to the gulf, and (during the seventies) to Israeli construction sites. The two population trends thinned out the surplus rural population and induced new sharecropping arrangements devoid of the traditional relation of patronage".

"On the other hand, the considerable migration of peasant-workers from the hilly regions seeking work opportunities in Israel or abroad did not result in any significant degree of land transfers or consolidations, aside from the areas referred to in the Jordan Valley. Here we

observe the migrant peasants, or rather the remaining members of their households, maintaining legal control over their lands, and farming them out to sharecroppers under favorable terms to the latter"²⁴.

According to this study, 164 farmers were sharecropping either totally or partially. Some of these farmers were either small owners, like in Marj Najah or non-owners, like in Jeftlik. The size of each sharecroppers land holdings varied from 10-50 dunums. This study also found that 71% of the sharecroppers farmed below 20 dunums of land a piece, while only 5% were sharecropping 50 dunums of land. The small number of dunums included in most of the sharecropped land is mainly for use by both small farmers and small owner farmers.

The conditions in the sharecropping contracts are as follows:

1. Annual contract between both the farmer and the landlord in the presence of two witnesses.
2. Landlord provides land and water.
3. Farmers provides labor, which could include the labor of his family members or land wage laborers he may hire.
4. Inputs and marketing costs are divided 50:50.
5. Net return from market crop is divided equally.
6. Decisions regarding producing and cultivating could be made by the landlord, the farmer or both of them together.
7. Landlord also provides some other services, like getting export permission from the military occupation authorities in the West Bank.

The sharecropping system has fewer advantages when the landlord is himself the merchant who provides the inputs and services.

As noted earlier in this study, the tenure system in the West Bank Jordan Valley is divided into three major system: ownership, cash rent, and sharecropping. Some of the sharecroppers participate in more than one system each year depending upon the availability of land, their contract conditions, and their ability to provide labor (family or wage). Table 3 describes these three systems in the study area along with the different sizes of the land farmed under each system.

TABLE 3. Share cropped and cash rented land in relation to owned land

Owned		cash rented		sharecropped	
# of farmers	land size dunum	# of farmers	land size dunum	# of farmers	land size dunum
10	3	4	7	24	10
4	7	7	8	20	12
7	20	4	10	10	14
4	30	4	30	44	20
10	150	4	40	10	21
-	-	10	50	14	25
-	-	10	250	4	30
-	-	10	310	10	40
-	-	-	-	10	50
Total	39	57	-	166	-

Tomato Production

Production and productivity

Productivity or crop yield is one of the most important outcomes of using these systems. Productivity per dunum could be divided into two major products: gross and net crop yield. Discussion of each one shows the differences.

Gross tomato productivity Gross productivity is the total yield per dunum (for example) before marketing. This yield is determined by the quantity and quality of the inputs used, like chemicals, fertilizers and water. This yield is not necessary the total amount which would be sold. This gross yield is different from one farm operating system to another. For example there are differences by the use of drip, furrow, sprinkler, or plastic houses.

TABLE 4. Tomato crop yield in Zbydat and selected neighboring 'regions by method of irrigation (1979/1980) yield : tons/dunum'²³

Cultivated area	furrow	drip	houses
Zbydat 1977	1.5	8.1	-
Zbydat 1980	0.5	6.0	-
Central east Ghor 1978	1.52	4.5	10
'Ateel (Tolkarem) 1980	-	1.5-8	10-11
Dair al-Ghusun 1980	0.75	7-8.5	10-12

Tomato net productivity Net productivity is the amount of marketed yield per dunum. This amount depends upon factors such as

marketing, prices, and ability to export the crop. Chapter 5 will analyze marketing and its problems, some of which result in a high rate of unsold tomatoes. The major problems include difficulty in getting export permissions, low prices, a high degree of competition with the Israeli settlers in the local markets, and the high cost of marketing. To further describe the differences between net and gross productivity, the case example of Mahmoud Smeirat, who is considered a big landlord, will be given. Mahmoud Smeirat planted 110 dunums with tomatoes. His gross productivity was about 800-880 tons in 1984, but he sold only 600 tons of his net productivity. This means that 200-280 tons were not sold (about 23% of his gross productivity). As a result, his gross productivity per dunum decreases by about 2.5 tons. This situation is much worse for small farmers who do not have the ability to market their crops as easily as the big landlords. In some cases, the net productivity of tomatoes per dunum decreased by 50-75% for the small farmers. This study found that the major three production problems are marketing, prices and export permissions.

This study also found that the minimum and maximum yield of the tomato crop depends upon such factors as soil, water, weather, and diseases. The minimum yield ranges from 2 - 8 tons per dunum with 75% of these farmers receiving less than 5 tons per dunum. The maximum yield ranged from 3-8 tons per dunum with 85% of these farmers receiving more than 5 tons per dunum. Drip irrigation and tunnels covered with plastic are the methods used to produce tomatoes.

The tomato planted land can be divided between two fields since some of the farmers own two pieces of land or they own and sharecrop at the same time. This study found that only 8% of the farmers get their tomatoes from two fields, while the remainder get it from only one field.

The possibility of planting more land with tomatoes is limited, according to this study, due to the following reasons:

Water resources Only 13% of the farmers said that water resources are a constraint on planting more tomato. This is not due to the availability of water resources, rather it is because most of the farmers in the study area are sharecroppers (especially those in Jeftlik) and according to the sharecropper agreement, as we saw before, the landlord is to provide the water. As a result, the farmer does not care as much about its cost nor its availability as he would if he were the owner of the land.

Lack of cash Eighty-one percent of the farmers said that they cannot increase the area planted to tomatoes due to a lack of cash. More cash is needed for both production and marketing operations. The lack of cash gives the merchants the opportunity to monopolize the small farmers, and this results in an increased cost of production and marketing. This study will show later in this chapter and in Chapter 5 that monopoly leads to increased costs.

Workers The family workers are the major source of the labor used in the production operation because the farmers in each cases

(sharecropper, owner, renter) cannot easily afford to labor wages. It is therefore no surprise, that only 6% of the farmers said that lack of workers was a major problem for producing more tomato.

Lack of land Land confiscation by the military Israeli occupation is the major constraint on availability of land, especially the cultivated land. As Chapter 3 showed, there are about 35 Israeli settlements in the West Bank Jordan Valley, which were built on cultivated land and were used by the Arab farmers. For example, 50% of the Zbydat village land was confiscated by the military occupation which then built the Aragman settlement.

Also, the natural geography of the Jordan Valley area, limits the amount of cultivated land. Annual rainfall is very low, about 150 mm, which is not enough for planting. Dry weather causes the need for more water resources, and due to the high degree of competition for water resources with the Israeli settlements, water resources are limited.

According to the study, 98% of the farmers said that lack of land is the reason for not producing more tomato.

Low prices All the farmers contacted said that low prices for the tomatoes was another reason for not producing more tomatoes. The low prices are a result of marketing problems. The tomato prices are determined in the market according to the demand and supply, however, competition from the Israeli settlements tomato crop, limitations on, exports to Jordan, and the closing of the Israeli markets all cause the tomato prices to remain quite low.

Military permissions The study also shows that 98% of the farmers said that receiving permission to plant from the military occupation is one of the most important constraint on their tomato production. This constraint will be discussed more fully later in this chapter.

Supply of Production Inputs

There are different kinds, quantities and costs of inputs supplies used in tomato production. These differences depend on the following.

1. Type of soil cultivated determines quantity and kind of fertilizer, machinery, seedlings, labor, and water used, and resulted in different kinds of production.
2. Different kinds of tenure systems.
3. Relations between landlord and sharecropper farmers especially when the first is a merchant, and
4. Variation of weather for the different seasons.

Seedlings

Farmers in the Jordan Valley use seedlings in growing tomatoes. Although, they are more expensive than the seeds and require more labor, they involve a lower risk of failure in tending the seedling after planting. The seedlings are grown by specialized growers in different areas of the West Bank. The sources for farms in the Jordan Valley are Jericho, Nablus, Tolkarem, and some Israeli farms. This study shows that Jericho is the major source of seedlings. Seventy-eight percent of

the farmers bought the required the seedlings for their 1984 winter tomato season from Jericho, 5% from Nablus, 15% from Tolkarem, and only 2% from Israeli farms.

The total number of seedlings used per dunum varies from one farmer to another and depends mainly on the type of soil and expected productivity. Most farmers use 10,000 to 20,000 seedlings per dunum. This study shows that in 1984 season, 37% of the farmers planted 10,000 seedlings. Thirty-one percent planted 11,000 seedlings, and 27% planted 12,000 seedlings, and 5% planted 20,000 seedlings per dunum.

The farmer has to select the most suitable date for purchasing the seedlings, because late contact with seedling growers leads to a delay in delivery of plants and/or inability to get the required number. Either outcome may result in late planting or in missing the growing season. Arrangements for delivery of plants to the farm can be made between the farmer and the seedling grower, and this may result in both a savings of time and of costs for the farmer. Decisions about the planting date effect the purchasing of seedlings, as a farmer may decide to plant at one time or at two (winter and spring).

The cost of seedlings depends on the purchasing source. Each farmer needs to find the lowest cost with good quality, so information about the seedling market needs to be provided. According to this study, the cost per seedling is 1-2 kersh (kersh = 0.01 JD) and 87% of the farmers pay 1.5-2 kersh/ seedling. The differences in the cost depend not only on the source, but also on the tenure system for the

farmers. Sharecroppers are paying 1.5-2 kersh per seedling, while some of the owners and cashrenters are paying 1 and 1.5 kersh per seedling. Generally the cost of seedling is not too much different from one farmer to another except for those who are provided with seedling from the merchant who is sometimes the landlord also, and also for those who purchase from sources which have high priced seedlings. As for the big landlords, according to this study there are 11,000 seedlings per dunum with a cost of 1-1.5 kersh per seedling.

Fertilizers and pest controls

The use of fertilizers and chemicals increases the chances for healthy plants with higher yields of tomatoes, but with a higher cost of production. Chemicals are used to control some diseases and insects. Information about the different kinds, and their effects needs to be provided by the extension personnel and or by visiting with different merchant agents in the market. Sharecropper farmers who have contracts with merchant landowners are provided with chemicals from the merchants store at higher prices than the market value. Due to a lack of extension education and training, the farmers could use more or less than the required quantities which will effect their tomato crop yield.

The farmers need extra labor time and machinery to apply the chemicals and the fertilizers. When a drip irrigation system is used, the farmer can use soluble NPK fertilizer added to the water and applied through the drip pipelines during irrigation. In this case, the farmer can get better efficiency in the application of fertilizers. The farmer

usually applies fertilizers one month after planting and repeats it one month later.

Different amounts of chemicals and fertilizers are used in irrigated agriculture, and the following kinds and rates are the most commonly used in the East Jordan Valley (see Table 5).

TABLE 5. Fertilizers used in the East Jordan Valley³

Kind of fertilizer	Rate of use kgs/dunum
Sheep manure	1000 every 3 years
Chicken manure	1000 every 3 years
Ammonium sulphate	60 at 2 frequencies
Compound NPK	60 at 2 frequencies
Triple phosphate	100 annually

Farmers in the West Bank Jordan Valley are mostly using the same kinds, but may be using different quantities, methods of application, and times for application.

The cost of fertilizer is different from one farmer to another depending on his source and whether he is an owner or a sharecropper with a landlord-merchant. The farmers could buy their fertilizers from Nablus, Jericho, or Tolkarem. The fertilizer merchants agents are acting as dealers for the Israeli product. The amount of fertilizer used varies from 1-5 sacks per dunum. Sixty percent of the farmers are using three or less sacks per dunum, while 40% are using between 3-5 sacks (sack = 40 kg) per dunum. Their cost per sack varied ranged from

5-8 JD, while the price per sack in the market was 4.5 - 5.0 per JD per sack. This study found that 89% of the farmers pay more than 6 JD per sack for the fertilizers.

The cost per sack for the fertilizers depends mainly on the source, i.e., whether it is from the landlord-merchant or from the market. If it is from the market and is purchased on a cash basis, it is between 5-6 JD per sack, including delivery.

Plastic

The farmers in the Jordan Valley are using a plastic covering system to improve their tomato production. They use a plastic covering for the seedlings first to protect them from the surrounding environment and later to cover the area around the roots of the seedlings. The first type of plastic is used for a limited time, especially in the first four weeks after the planting to protect the plants from the weather and diseases. A second type is used for the remainder of the season to protect the roots of the seedling from other weeds and grasses. Spreading of these plastic sheets is done by tractors in August. Farmers can buy plastic sheaths from the Jericho, Nablus, or Tolkarem markets. In this study, 87% of the farmers bought their plastic sheaths from Nablus, which is the nearest city to the farmers. Plastic sheets are sold by kilograms (kg) and per dunum need for the plastic is different from one farm to another. The need for plastic ranged, from 20-30 kg per dun with 22.5 as the average per dunum. The cost of the plastic varied from 0.50 - 0.65 JD/kg due to several

criteria such as source, method of payment, and the relationship to the merchant (for example Sharecroppers). This study found that 96% of the farmers paid more than 0.60 JD per kg while the market price at that time was 0.48-0.50 JD/kg. Also, 20% of all the farmers paid 0.65 JD per kg which is about 0.15 JD per kg over the market prices. The prices were not the same for all the farmers. Some paid only slightly higher prices, while others paid a much higher price as much as 0.65 JD/kg of plastic. According to this study, the different prices for plastic sheets was directly associated with the land tenure system for each farmer. These results can be clearly seen in Table 6.

TABLE 6. Prices of Plastic According to the Tenure System kersh/kg

Size of land Holdings	Owners		cash rented		sharecropper	
	50	60-65	50	60-65	50	60-65
0-50	-	29	4	33	-	165
51-100	-	-	-	-	-	-
101-150	10	-	-	-	-	-
151-200	-	-	-	-	-	-
201-250	-	-	10	-	-	-
251-300-	-	-	10	-	-	-
Total	10	29	14	43	-	165

Table 6 shows that only the big landlords, who owned or rented a large amount of land actually paid the market price for plastic sheets. These big landlords owned and/or rented more than 150 dunums which gave

them the opportunity to obtain good prices because they had enough capital to buy the plastic directly from the merchants agents. Small farm owners, small cash renters and sharecropper farmer all paid similar prices which varied from 0.6-0.65 JD/kg. For the sharecropper farmers, this study found that 67% of them paid 0.6 JD/kg, 27% paid 0.65 JD/kg for the plastic sheets. and the rest paid 0.62 JD/kg. The higher price for the plastic paid by the sharecropper and small farmer owner are due to their relation with the landlord-merchant. The merchant supplies these farmers with inputs and services at higher prices according to an agreement which is accepted by both the farmer and the merchant. Lack of capital and land for the sharecropper and small farmers leaves them in a position where they must accept the prices which the landlord merchant demand.

Drip lines

The goal of using drip irrigation is to give the plants the necessary quantity of water they need. Though the system supplies plants with water in a mechanical way, labor is required to put the system in operating condition and to check for clogged drippers. Laying the drip lines usually occurs in August, while checking the system, begins on the first day of planting and ends only after days before the last harvest.

Landlords usually build the drip systems and charge the farmers for annual depreciation costs. Drip system can last from 3 to 5 years. The cost per dunum for a drip system varies from 120-160 JD/dunum depending

on where the equipment is purchased, labor wages, and the basis for payment.

This study found that the big landlords paid 120-140 JD/dunum, while small owners and small cash renters paid 150-160 JD/dunum. The sharecropper farmers who owned a small amount of land in addition to their sharecropped land, paid the same costs as the small farm owners, 150-160 JD/dunum. Interestingly, 73% of the farmers interviewed did not know the cost of building a drip system.

Water

In Chapter 3 of this study, it was clear that water resources are limited in the Jordan Valley. Also, 96% of the farmers indicated that lack and/or limitation of water resources is one of the reasons for not planting more tomatoes. Even though, many of the sharecropper farmers did not say that there is a problem with water. This is due to the fact that they are provided with water by their landlord and do not share in the cost of water. They basically only provide the labor. There is no information about the standard level of water per dunum for tomatoes; however, the cost of water paid by the small farmers and the big landlords varies from 30-45 JD/year for each dunum. The total cost includes fuel, maintenance, and employees. The two major sources of water for irrigation are wells and springs. Most of the farmers in Jeftlik are using springs as their major source and in the case of the big landlords some of them have their own wells to provide their sharecropper farmers with water. The water is distributed to the farmers according to their landholdings or sharecropping.

Labor

Manual labor requirements for irrigated agricultural land are supplied by both the family and local labor force. These two sources are discussed separately below.

Family labor According to the social relations within an Arab family, each capable member of the family must share in working in the farm. Limitations of the extended family partially effected this type of relation, but it is still very popular in the West Bank Jordan Valley. This study shows that all of the interviewed farmers had 1-4 male members of the families working in agriculture, with an average of 1.9 workers per household. Also, 94% of the farmers said that 1-8 female members of their families worked in agriculture, with an average of 2 members per household. This means that the farmers depend basically on their own family members for farming, and that the future development of agriculture in the Jordan Valley is related to the number of family members who can contribute their labor. Family labor is used for planting, and harvesting. It is different from one season to another during the year and is related to the school vacations for the students.

Wage labor Farmers try to avoid the use of wage labor because he would have to pay all of the wages from his returns (this includes sharecropper farmers who are contracted to provide labor without sharing the costs with their landlord. Technical wage labor is required for some part of the production operation like lying the drip pipelines and

spreading the plastic sheaths. Also, wage labor is sometimes required for harvesting. According to this study, 42% of the farmer used wage labor in 1984. Wages ranged from 3-5 JD per day for a single worker. The differences in wages are due to the skill level, purpose for hiring, and sex. Female workers and children are most often hired for harvesting the tomato crop because of the lower wages paid to them, as a result the labor is not considered a constraint factor in tomato production. This low cost for wages is why the present study found 94% of its farmers saying that workers are not slowing down the expansion of tomato production in their area. In fact, the use of drip irrigation and the plastic covering systems had limited the availability of needed labor and had constrained these farmers ability to pay for technical workers.

Finally, the use of machinery (tractors), drip irrigation systems, fertilizers and plastic coverings led to a transformation in the use of labor in both the production and marketing processes since some of these processes had been done by labor and now were done by machine (harvesting, manuring, and irrigation for example). Also some part of these processes had been done by men and were now done by women and/or children (like packing, hauling and harvesting). Figure 5 shows the division of labor and related work tasks before and after drip irrigation in Zbydat.

Work task	Before drip irrigation			After drip irrigation				
	Mach ine	Men	Wo- men	Chil dren	Mach- ine	Men	Wo- men	Chil- dren
Ploughing	x	x			x			
Harrowing		x			x			
Farrowing		x			x			
Manuring		x			x	x		
Covering Manure			x		x		x	
Irrigation and cleaning furrows		x			x			
Plastic and Drip lines	NA	NA			x	x	x	
Sowing and transplanting		x	x			x	x	
Weeding			x	x		x	x	
Spraying	x	x	x		x	x	x	
Fertilization		x	x		x			
Harvesting		x	x	x		x	x	x
Packing		x	x			x	x	
Hauling		x	x			x	x	
Peddling by road		?		x			x	
Clearing Drip lines & plastic Sheaths	NA	NA	NA				x	x

Notes: X : indicates the factor(s) used in the activity.
 NA : not available

FIGURE 5. Division of labor and related work in Zbydat (Tamari and Giacaman 23, p. 46)

Credit

Credit services are offered to farmers through the Jericho Cooperative (JCMAC) and some other foreign organizations for marketing their agricultural crops. The seasonal loans provided by the JCMAC with a 4% interest rate are considered the major services provided by this cooperative to its member farmers. The total amount of these loans depends on the number of dunums planted or owned. This gives the big landlords the opportunity to receive the biggest share of the available loan money. The JCMAC loans 10 JD/dunum. Foreign organizations have two kinds of loans and subsidies available for the farmers: cash and non-cash (agricultural inputs), while landlord merchants supply the farmer with seasonal loans as inputs and services with higher prices than those in the market. This study found that 78% of the farmers were provided with cash loans from the JCMAC in 1984. The total amount of individual cash loans ranged from 80-2500 JD/farmer, with a 4% interest rate. Eighty three percent of the farmers received 800 JD each while 17% of them received 1000-4000 JD each. In addition, all of the farmers said that the JCMAC should provide more cash loans.

Agricultural machinery

The use of new technological methods in agriculture, like drip irrigation and plastic coverings, has required new machinery. The use of machinery in irrigated agriculture in the West Bank Jordan Valley has been confined to ploughing, application of chemicals, and water pumped from artesian wells. Farmers also use tractors, sprayers, and other

pumping machinery. Most farmers own these machinery items except tractors which can be rented from other farmers or other tractors owners.

Tractors are usually owned by big landlords who provide the farmers with this service. This study does not have any information about agricultural machinery, but all of the small owner farmers who use drip irrigation and plastic covering can be assumed to own the previously listed machinery except tractors. While some small farmers may own a tractor, sharecropper farmers do not own any of them.

Research

Agricultural research about the West Bank Jordan Valley is conducted basically by the faculty of social sciences (economics, sociology, agriculture and health) in the local universities, especially Birzeit and An-Najah, and the local research and study centers like Birzeit University Research Center, An-Najah rural development center, Arab Thought Forum, and Arab Studies Organizations. Limitations on research are due to the policies of the military occupation authorities, which require military permission before doing any field research. Also, lack of basic data about the West Bank is considered another limitation. Two studies were conducted very recently. A field work survey about all of the West Bank and Gaza Strip areas was done between 1980-1983 by the Birzeit Research Center. It included many different subjects like housing, education, population, work force, job, land, and agriculture. Another field study by Arab Thought Forum, which started

in 1983 and is not finished yet, is to cover the West Bank Jordan Valley and the closed regions. This survey is also covering many topics, especially in agriculture.

Recent Technological Developments in the West Bank Jordan Valley

Arab farmers have many reasons to search for more advanced technology in agriculture. Increasing their production, getting better quality crops, and reducing their cost of production over the long run were the major reasons. The cost of using advanced technological methods in agriculture is very high, so the first people who started using them were the big landlords. The use of drip irrigation, for example, started only at the end of 1976 in Zbydat village. The possibility of producing winter vegetables in the West Bank Jordan Valley gave the Arab farmers the opportunity to supply the market (local and foreign) with early agricultural production. The increasing demands for these crops led to the introduction of advanced technological methods. These methods are mainly used in two parts of the production process: plastic covering and drip irrigation.

Plastic covering

The purpose of plastic covering is to protect the crop from the harsh climate. This results in longer production and harvest periods for the crops, and consequently higher yields. This plastic covering is divided into two kinds, tunnels and houses. Tunnels are the most commonly used plastic covering system in the West Bank Jordan Valley. A

tunnel is 110-130 cms in width and 30-50 cm in height. The length varies from one form to another depending on the size of the farm, thus the number of tunnels per dunum varies too. The cost per dunum for the tunnel construction depends on the price of the inputs used (plastics, wires, poles, and labor). The cost of the tunnel is paid by both the farmer and the landlord equally. The estimated lifetime of a tunnel is usually three years. An approximate cost per tunnel is around 100 JD, and no studies about them have been done to this date.

The use of plastic houses in the West Bank Jordan Valley is limited due to the high cost of building them. There are a few dunums of plastic houses in the Jericho area built by the agricultural engineering cooperative. The size of the plastic house varies. It could be 330-750 square meters. Building a plastic house costs about 1500-2000 JD, according to an estimate from the extension people, depending upon its quality and specification.

The productivity per dunum of both plastic covering systems is very high when compared to the traditional open field system. Table 7 shows the average yield in tons per dunum for both tomatoes and cucumbers for the different types of production.

TABLE 7. Average yield (tons/dunum)²¹

	open field	tunnels	houses
Cucumbers	0.86	4	9
tomatoes	1.5	3	10

Drip irrigation system

The transfer of agricultural laborers to work in Israeli factories increased local labor wages. A new system of irrigation was needed to alleviate the agricultural labor shortage. Drip irrigation with black plastic covering is the most common method adopted in the Jordan Valley. This study found that all of the farmers in the three selected villages of the Jordan Valley area are using the drip system with mulch and plastic tunnels. This system was introduced to the area in 1976 by the Mennonite Central Committee in Jerusalem. "In October of 1976, Abdullah Muhamad Hasan who owned 9.5 dunums in Zbydat and share-cropped 20 dunums from the property of Jamil Abdul Fatah (Abu Anwar), installed drip pipelines on three dunums on the land he sharecropped with Abu Anwar on an experimental basis. The mennonite central committee, Abu Anwar, and Abdullah shared the cost of the pilot project which amounted to IL 18,000 at current prices. At that time it cost \$600 - \$1300. The result was dramatic: a five fold increase in the yield of tomatoes, from 1.5 tons in open furrow fields to 8 tons per dunum under drip irrigation"²⁴.

After this success of the drip system, the farmers in the Jordan Valley started to shift from the open-field system to drip irrigation. The high cost of building this system was the main constraint for the small farmers. The cost ranged from 120-180 JD according to this study.

The advantages of the drip irrigation system as discussed in a study by Salim Tamari, are the following:²³

1. Drip irrigation supplies crops with the optimum amount of water needed, eliminating the fluctuations in soil moisture content associated with open furrow and sprinkler irrigation. As a result an early crop can be obtained; ensuring the farmer with higher income because of the market demand.
2. Saving on water resources in areas of water shortage. Plants in the drip system utilize 80 - 95% of the water used, against 50% in furrow irrigation and 70-80% in sprinkler irrigation.
3. The drip system works effectively with saline water and in soil environment with relatively high salinity. The accumulated buildings of salt in the soil is effectively overcome by drip as a result of the "continuous leaching" since water emitted from the porous holes of the tubes is pushed away from the planted roots.
4. Increased crop yield, and a more uniform growth of plants. The latter process facilitates mechanical harvesting, where applicable.
5. Drip enhances the effective use of fertilizers since soluble chemicals are fed into the plant with the irrigation water. This eliminates the loss and danger (e.g. "burning") arising from excessive use of fertilizers. In addition because water use is restricted to the immediate plant area, the growth of weeds and fungi is restricted.
6. Finally, the use of drip irrigation cuts down significantly the cost of equipment and power (gasoline) needed under sprinkler and furrow; since less water pressure is needed to carry water to outlying fields.

Impact of drip irrigation and plastic covering

Using these advanced technological methods in agriculture has affected the life of farmers in the Jordan village area. This effect has come to reach both their local economy and their social organization. But at the same time, this effect has varied from one farmer to another depending on the size of land holdings, tenure system, and household size.

This impact was shown very clearly in a study done by Dr. Salim Tamari and Dr. Rita Giacaman about Zbydat (one of the present study area villages) in 1980. They summarized the impacts in the following: ²³

1. A substantial increase in crop yield over that obtained from open furrow irrigation from 5 times to 8 times tonnage per dunum.
2. An earlier harvest of vegetables allowing Zbydat farmers to start marketing such crops as eggplants and squash by December, and cauliflower and tomatoes (their main crop) by January. This means a higher price at a period of limited supply in the vegetables markets of the West Bank, Israel, and Jordan. This is perhaps the crucial factor in the increase of income for the Zbydat community.
3. The increased income allowed the Zbydat farmers for the first time throughout their residence in the Jordan Valley, to be freed from the exploitative relations they had been compelled to contract with the commission agents and merchants of the Nablus vegetable market. This new flexibility was caused by the creation of a disposable surplus which allowed the small farmers to finance a new agricultural cycle (i.e. double cropping) without resort to high-interest linked credit.
4. Increased productivity per labor unit also contributed to the increase in bargaining power of share-croppers. Especially when-- as the case in Zbydat-- the farmers contribute to the installation cost of the drip. This trend, however, is only hypothetical and tentative as it is too early to tell.
5. Drip irrigation has led to the reorganization of the labor process in Zbydat. Because the drip system is an intermediate technology, it is not labor displacing. Its net effect has been (a) to relieve household members from the heavy work associated with the maintenance and repair of furrow canals, and (b) to increase the work load during the planting season, and especially during the picking and harvesting season (January to April). During the peak harvest almost every household in Zbydat employs external wage labor to help with the picking. One recent alternative to this has been a form of crop-leasing to Israeli vegetable merchants.
6. On the negative side, drip irrigation has created conditions of further dependency on Israeli technology, and on a new complex set of marketing arrangements. While the maintenance and replacement of the drip lines is itself not a very complicated process and within the

mastery of Zbydat farmers, their integration into a competitive market compels them to adapt to new varieties of seeds, salinity resistant seedlings, and insecticides, whose prices and development are completely out of reach of the small farmer.

7. Finally, the accumulation of capital as a result of the increased crop yield from drip irrigation is an uneven process. It will affect medium sized farm differently from small farms --and sharecroppers from owner-cultivators. So far there has been almost no tangible difference in the conditions of share-croppers from owner-cultivators within the same tribe. Our observations leads us to speculate that in the coming years such issues as inheritance of property rights, plot consolidation, and differences in lifestyle and consumption patterns are likely to create new divisions in the Zbydat community, which-so-far have been dormant or non-existent.

The agricultural cycle of tomato production

The introduction of drip irrigation and plastic covering and weather are the major factors effected the agricultural sector. Figure 6 shows the annual cycle of tomato production.

Landlord-Merchant Role

The merchant landlord role is best seen through a description of the relationship between the farmers and the merchant or the landlord. Sometimes the landlord is a merchant. Two cases will be considered in this discussion. The first one is when the landlord is a merchant and the second case is when the landlord is not a merchant. The discussion will consider the decision making, the inputs and services supplied and the sharing of the cost of tomato production.

Nature of Activity	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Ploughing & Harrowing										x	x	
Farrowing & Manuring	x										x	
Laying of Drip lines	x										x	x
Spreading of Plastic sheath X												
Spraying Insecticides			x	x								
Spraying of Hormones					x							
Weeding	x			x								
Hiring Extra Labor				x		x	x	x				
School Vacation	x										x	x
No crop available for home Consumption	x	x	x									x
cash Available								x	x	x	x	x
Rain				x	x	x	x	x				

Note : X : Indicates the factor(s) used in the activity.

FIGURE 6. Annual Cycle of Tomato Production (Tamari et al. 23, p.49)

Landlord-merchant

The first case to be discussed is when the landlord is the merchant. This study shows that only 29% of the landlords are at the same time merchants. In decision making situations, this study shows that landlords, whether they are themselves the merchants or not, are the ones who make the decisions most of the time related to the agricultural operation. Table 8 clearly shows who is making the decisions.

TABLE 8. Decision making for landlords and farmers by percentage

	farmer	landlord	both	Total %
Purchase of agricultural inputs	31	54	15	100
Hire harvest labor	95	5	-	100
Transportation	27	63	10	100
Sales commission paid	27	63	10	100
Source of boxes	27	58	15	100
Where to sell	28	40	32	100
When to sell	28	42	30	100

From Table 8 we can conclude the following.

1. Decisions on hiring harvest labor are mostly made by the farmer: Because in all situations the farmer pays the wages.
2. Fifty four percent of the cases show that decisions on purchasing agricultural inputs were made by the landlord alone, 32% by the farmer alone (the case of the small farmer owners),

and only 15% where the farmers (sharecroppers) shared in the decision making.

3. For marketing services decisions, in an average of 61% of the cases the landlord made the decisions by himself alone.
4. Although in questions of where and when to sell the landlord took 40% of the decisions alone, this study also shows a higher rate of cases where the farmer shared these decisions with the landlord, because of the importance of these two marketing decisions.

The landlord merchants supply their sharecropper farmers with most of the inputs and services used in the tomato production and marketing operations. Agricultural inputs (land, seedling, plastic, water, fertilizer chemicals, drip irrigation systems and machinery), marketing services (selling the crop, transportation, information and boxes), and capital are the three major inputs and services provided to the farmer by the merchant. On the other hand, the farmer provides his labor and if he needs more usage labor from outside his family he pays for that alone. The share of cost is negotiable and according to this study the most common share is equal for all inputs and services, except for water and wage labor. Landlord-merchants provide water and the farmers provide wage labor if needed.

The landlord-merchant situation gives the landlord-merchant more opportunity to control the production because he is the owner of both the land and the inputs. He can decide whether he wants to renew a contract or

not; he can control the market; he can force the costs of inputs and services required; and he can even control the life of the farmer and his family.

Non-merchant landlord

The second case to be discussed is when the landlord is not a merchant. In this case the landlord provides the land and water to the farmers under the same conditions as if he were a merchant. The cost of production and marketing are also divided equally, except for water and harvest labor which are paid for as in the previous case.

Usually the landlord is not a merchant in the following cases: When he is a small farmer who owns a small amount of land; when he has cash rent farmers; or when he is a big landlord who never becomes a merchant. Some sharecropper farmers are sharecropping land from merchants and non-merchant landlords.

When the landlord is not a merchant, a new set of relationships exist between the farmer and the landlord as well as between the farmer and the merchants. Many farmers have non-merchant landlords. This study includes 28 farmers' surveys. These include small owner farmers, as well as renter farmers (especially the farmers in both Zbydat and Marj Najah) and several sharecropper farmers who are farming the land of non-merchant landlords. These farmers are supplied with agricultural inputs and marketing services except land from the non-landlord merchant. They receive their inputs and services on a credit basis which is to be repaid by selling the tomato crop. The crop must be sold by the non-landlord merchant in his market or

store. High prices for inputs and services are forced on the farmers. Decisions are made by the merchant, especially marketing decisions, to be sure that he will receive his capital (cost of inputs and services).

Tomato Production Problems

The current situation for tomato production generates many problems including high cost of production, limitation of some input resources (like water and land), and the need to obtain military permission to expand the tomato plantation area. This study will discuss each problem separately.

Military permission

The need for military permission to expand the area planted with irrigated vegetables has become a very important problem in relation to tomato production. Tomato production is considered the most important crop in the West Bank Jordan Valley, therefore any major effect on irrigated vegetables will also effect tomatoes. When the farm questionnaire for this study was prepared, military permission for expanding tomato irrigated land was not considered. However, when the interviewing was done, this study showed that all of the farmers, in spite of their tenure system, were complaining about this military law. This law was described by Abu Arafa as follows; "At the beginning of April 1984, the Israeli military occupation authorities started to limit the plantation of the irrigated vegetables in the West Bank Jordan Valley. Therefore, it asked the Arab farmers in the area to fill special forms for limited area of the vegetables which the farmers cannot increase"¹.

This step came to constrain and limit the possibility of any agricultural development in that area which is considered to be one of the most important areas in the West Bank. It also resulted in limiting the amount of all cultivated land in the West Bank Jordan Valley. Any plans in the future which try to increase the cultivated area might be rejected. Small farmers and sharecroppers would be the people most affected by this military law, although it would also affect all farmers and landlords.

Cost of Production

There are no studies about the cost of the tomato production in the West Bank Jordan Valley, but a study was done by researchers at the University of Jordan in 1978 which shows the different costs of tomato production inputs in the Jordan Valley.

Table 9 shows the cost of the tomato production per dunum found in their study. Cost of production reported on the survey takes away from 30 - 40% of the reported tomato revenues. Lack of capital forces the sharecroppers and the small farmers to pay more for inputs purchase on a credit basis from merchants. Cost of production varies from 80-104 JD per dunum depending upon the amount of inputs used per dunum and the price of inputs which vary by the tenure system of the farmers.

The amount of inputs used per dunum is the less important factor in determining the production cost per dunum. Farmers use nearly the same amounts of inputs per dunum regardless of their tenure system. Cost of inputs or the net price of tomatoes is the important factor. Table 10 shows that only the level of fertilizers input used by sharecroppers is significantly less than the level of inputs used by other tenure groups.

TABLE 9. Cost of tomato production per dunum²¹

	Item	Unit	freq	total	cost/du JD
			uency	amount	
1	Ploughing	mach. hrs	2	0.6	0.8
2	furrowing	Mach. hrs	1	0.2	0.25
3	Zigzag furr	man hrs.	1	4.0	1.6
4	Planting	man hrs.	1	3.0	1.2
	seedlings	no	1	1500	2.5
5	Hoeing	man hrs.	3	15.0	6.0
6	Fertel app	man hrs	4	4	1.6
	Ammon. sulph.	man hrs	2	80	4.16
	Super ph.	kgs	1	75	1.87
	compound	kgs	1	50	4.16
	manure	m ³	1	1.3	10.4
7	Irrigation	man hrs.	9	13	5.2
	Water	m ³	9	595	1.78
8	Dusting	man hrs	1	0.5	0.2
	sulpher	kgs	1	3	0.36
9	Spraying	man hrs.	5	5	2.5
	Zenib	kgs	3	0.54	0.35
	Cosan	kgs	4	0.8	0.24
	lannate	kgs	1	0.04	0.48
	Pholidole	litres	4	0.2	0.69
10	harvesting	man hrs.	13	35	14.0
	total cost				60.34

Table 10 shows that for the fertilizer land owners use over 20% more than sharecroppers. Sharecroppers pay more per sack and try to minimize their production cost. Also sharecroppers do not use hired harvest labor, they depend only on their family labor, because by the lease agreement all hired labor is the sharecroppers responsibility.

On the other hand, price per unit is different from one farmer to another and according to the tenure system. The price of the inputs used

TABLE 10. Tomato inputs by tenure

Inputs	Unit	Landlord and small	cash renters big	Share cropper
Seedlings	H/Du	11	11	11
Fertilizers	sack/Du	3.75	3.5	3
Plastic	Kg/Du	22.5	22	22.5
Cash loans	JD/du	10	10	10
Harvest labor	L/Du	3.5	3.5	-

Note : H : Hundred
 Sack : 40 kg
 KG : kilogram
 JD : Jordanian Dinar
 L : labor

were taken as an average for each case. Table 11 shows the distribution of the tomato input prices per tenure.

TABLE 11. Tomato input prices by tenure

Inputs	Unit	landlords small	and cashrenters big	Share cropper
Seedlings (11 hundred/DU)	JD/H	1.5	1.0	1.7
Fertilizers (3 sacks/DU)	JD/Sack	8.0	5.0	8.0
Plastic (23 KG/DU)	JD/KG	0.63	0.50	0.63
Cash loans (10 JD/DU)	%/3 month	4.0	4.0	4.0
Harvest Labor (3.5 days/DU)	JD/day	3.6	3.6	-
Investment in drip irrigation (5 years life)	JD/du	29.33	28.0	31.0

Table 11 shows that small farmers and sharecroppers are paying 25% more for plastic, 60% more for fertilizers, and 60 to 75% more for seedlings than the big landlords. The merchant selling seedlings, fertilizers, and plastic obtains a bigger margin in input sold to sharecroppers and small farmers than from the sales to the big landlords.

The variation in the production costs per dunum varies widely by tenure system. The total inputs cost is 103.5 JD/dunum for the small owners and 88.6 for the sharecroppers and 80.5 JD for the big landlords and big cash renters (see Table 12). Most of the difference is the result of different prices on fertilizer, seedlings and hired harvest labor.

TABLE 12. Total inputs cost per dunum by tenure

Inputs	Unit	Landlord and Cashrenters		Share cropper
		small	big	
Seedlings	JD/DU	17.0	11.0	19.0
Fertilizers	JD/DU	30.0	17.0	24.0
Plastic	JD/DU	14.2	11.0	14.2
Interest on cash loans	JD/DU	0.4	0.4	0.4
Harvest Labor	JD/DU	12.6	12.6	-
Drip irrigation	JD/DU	29.3	28.0	31.0
Total cost/ Dunum	JD/DU	103.5	80.5	88.6

Table 12 shows that small farmers and sharecroppers are paying higher cost per dunum than the big landlords and big cash renters. Sharecroppers do not hire wage labor so they do not have harvest labor cost, so they pay

less cost per dunum than the small farmers but still higher than the big landlords. Assuming the harvest wage labor is paid to the sharecroppers for their work, implies that both the sharecropper and the small farmers pay higher cost by about 22.5 JD/dunum than the big landlords and cashrenters. This means that they pay about 23% more than the big landlords.

The study shows other different problems relating to tomato production. Diseases, water resources, marketing, prices, and weather were shown to be production problems. On the other hand, lack of water, capital, land, and low prices were shown as limiting the ability to expand the tomato production in their study area. Table 13 shows the different tomato production problems according to their farmers.

TABLE 13. Tomato production problems

problems	number of farmers	% rate
Diseases	151	67
Water	50	22
Marketing	187	83
Price	191	85
permission	224	100
weather	224	100

In regard to planting more tomatoes, the study shows many different reasons which are explained in Table 14.

TABLE 14. Constraints of expanding tomato production

Problems	number of farmers	%
Lack of water	27	12
lack of capital	181	81
lack of workers	14	6
Lack of land	221	98
military permission	221	98
low prices	224	100

TOMATO MARKETING ANALYSIS

The Marketing System

Marketing channels

To understand the marketing system in the West Bank, one must have knowledge of the marketing channels, i.e., how the agricultural products flow from the producers to the consumers. "The sequence of intermediaries and markets through which the goods pass enroute from producer to consumer is known as a market channel"⁵. The sequence is from farmers as producers, to wholesalers, commission agents, exporters, retailers and finally to consumers.

Land owners or land renters working through sharecroppers are the major suppliers of tomato production. In the Jordan Valley most owners, renters, and sharecroppers are cooperative members but sell their product through a middleman or commission agent. Only a small percentage is sold directly by the producers to wholesalers or to the retailers. Tomato from the West Bank Israeli Settlements comes to the West Bank markets directly to wholesalers, and competes with the local product.

Local markets

Central wholesale markets In the major cities of the West Bank there are central wholesale markets. A retail market is in the same building. These facilities are owned and directed by each city. To use the market, a fee equal to 3% of the produce value must be paid by the producer who brings in the product. The middleman or commission agent who

arranges the sales inside the market earns between 5-7% of the value of the total sold.

The major central markets around the Jordan Valley area are, Nablus central market, Jericho central market, and Jeneen central market.

Retail markets The retail markets exist to all population areas and commercial districts in the West Bank. Most agricultural product retailers including tomatoes are gathered in the Hisbat (agricultural crops market). At the same time, there are some retailers, who are selling fruit and vegetables to the consumers outside these Hisbat.

Foreign markets

Israeli markets The Israeli markets are closed to the Arab farmers' products. Military permissions are required to export to the Israeli markets, and it is very difficult to get these permissions.

Jordanian markets Jordan is considered the biggest importer not only for the West Bank tomato crop but also for other agricultural products. Export to Jordan must pass through several steps.

Finally, the system of direct marketing is not very popular in the local markets. Most of the products must pass through one of the different local markets to be sold in order to get the best price. In some cases the buyers come to the field and try to buy the crop from the farmers to get lower prices. These cases are sometimes preferable to the farmer as he can save part of his marketing cost if he gets a good price.

Direct marketing is very difficult in the Jordan markets, as all of the exported products should be sold through the official markets.

Marketing Agents

Middlemen in Central Wholesale Markets

The middlemen in the central markets provide more than one service to the farmers. They can be exporters, wholesalers, and commission agents. In the Jordan Valley, the marketing cooperative is supposed to play a big role in the marketing system.

Commission agents The main job for the commission agents is to sell the products for the farmers and to negotiate with the wholesaler or retailer. The commission agents in the West Bank Jordan Valley play another big role, as they provide the farmers with loans. They charge the farmers about 5-10% of the total value of the sold product. In many cases the commission agent is a merchant and the wholesaler.

Wholesalers The wholesalers sell and buy their own products and products of farmers. They collect 5-10% from the total sold value as commission.

Exporters The wholesaler is generally the exporter.

Jericho marketing cooperative The main objective for this cooperative, which is located in Jericho and has branches in the study area, is to provide marketing services to the farmers. The major services of this cooperative include providing: cash loans (10 JD/dunum) for three months and obtaining export permissions from Jordan.

Middleman in retail markets

Retailers in the Hisbat The major function for these middlemen is to buy the goods from the wholesaler and control markets and sell them to the consumers in the Hisbat.

Retailers in the populated areas These retailers are selling mainly in the high income area, with high quality goods.

Moving retailers They sell their produce directly to the consumers on small trucks (pickups).

Retailers on the sidewalks The farmers who have their farms located near or on the main roads, usually sell part of their crops on the side roads.

Tomato Marketing Services and Margins

Marketing services and costs

Marketing services include all the actions from the collection of produce and its transfer to the areas where it is demanded. The major marketing activities are transportation, export, permission, grading and packing information and financing.

Transportation There are two kinds of transportation for the products according to the market area. Shipment of the products between the farm and the central, wholesale markets is done by small vehicles or trucks. Shipment to Jordan is done by big trucks with special characteristics and governmental permission from both Jordan and Occupation Authorities. Landlord-merchants are mainly the owners of these small and

big vehicles. The cost of transportation is about 10% of the total sold value. The cost of transportation is per box and is different according to several criteria:

1. Location.
2. Tenure system of the farmer.
3. Ownership of the transport means.

The study shows that the cost of the transport to Jordan varies from 0.10-0.18 JD/box. It also shows that 67% of the farmers are using the landlord-merchant trucks. This is why the farmers pay such a high cost of transport to Jordan; the average is 0.12 JD/box, while 76% of the farmers pay 0.12 JD/box. Specifically 50% of them pay 0.15-0.18 JD/box. The low cost of transportation to Jordan in some cases is due to the use of other means of transportation than the landlord merchant trucks (trucks used by other people or farmers).

Transportation to the local markets is not any better than transportation to Jordan. As the study shows, 67% of the farmers are using the landlord-merchant trucks. The farmers pay for the local transportation cost between 0.15-0.21 JD/box (the size of the box transported to the West Bank markets is bigger than that transported to Jordan by 6kgs). Also 72% of the farmers pay 0.2 JD/box to the local markets, while others pay 0.15 JD/box and this is also due to the use of other trucks than the landlord-merchants.

The study also shows different costs of transportation to Jordan in 1984 according to the tenure system. Different costs to the landowners,

sharecroppers, and cash renters. For the case of owners we have two different situations with different costs:

1. The big landlords who own large amounts of land, and they are about 64% of the owners. The cost for transportation for these people, both to Jordan and to local markets, is much lower than that for the farmers, especially the sharecropper farmers. These landlords pay 0.1-0.11 JD/box to Jordan and 0.15-0.18 JD/box to the local markets. This is because they can pay for the transportation cost by cash and not by credit like the smaller farmers.
2. The small owner farmers who own small amounts of land (the case of Marj Na'ja farmers). Because they are supplied with the inputs from the merchants, they have to use his means of transportation and they cannot pay on a cash basis. Thus they pay higher costs of transportation to Jordan. According to the study, it shows that 36% of the owners are considered as small owners and they pay 0.12-0.17 JD/box for cost of transportation to Jordan, most of them pay as much as the sharecropper farmers.

For the case of cash renter farmers, they pay different costs depending on whether they are supplied with inputs from the merchants or not and payment method. The study shows two cases for these farmers. First the big landlords who rent large size lands pay low cost, 0.1-0.11 jd/box. The second case is for the small renters (case of Zbydat farmers) who are supplied with inputs from the merchants and pay 0.11-0.15 JD/box for transportation to Jordan.

The last case is for the sharecropper farmers, who are supplied with inputs from the merchant. These farmers pay 0.10-0.18 JD/box and the difference in the cost is due to whether the landlord is a merchant or not. However, 63% of the sharecropper farmers pay more than 0.15 JD/box for the cost of transportation to Jordan.

Cost of transportation to the local West Bank market is greater than that for Jordan, and mainly depend on the same factors. Different cost of transportation depend basically on whether the farmer is the owner, cash renter, or sharecropper, payment basis and relation with merchants.

For the case of owners, as before, costs depend on the size of the landownership. The study shows that the big landlords pay 0.15 JD/box while the small owners pay 0.20 JD/box for cost of transportation to the West Bank markets.

In the case of cash renter farmers, it is similar to the owner case and depend on whether the farmer is a big or small owner or sharecropper. The study shows that the big landlords, who are also cash renters sometime, pay the same cost for transportation as the previous case which is 0.15 JD/box. While the other cash renter farmers who are considered small farmers as they might own small land, or sharecroppers pay higher costs than the big landlords. Their costs vary from 0.8-0.2 JD/box and they are about 80% of the cash renter farmers.

The last case is the sharecropper farmer who are independent and not supplied with inputs from the merchants pay higher cost than the big landlords and the farmers. The study shows that the sharecropper farmers

pay 0.18-0.21 JD/box and 94% of them pay more than 0.20 JD/box which is considered too high in comparison with the big landlords who pay 0.15 JD/box.

Finally, the cost of transportation to both West Bank and Jordan depend also on the sale price of tomato and the size of the load. Also it is clear that the sharecropper farmer and the farmers who are supplied with inputs by the merchants are those who pay the highest cost of transportation to both Jordan and the local markets.

Export permission Jordan is the major importer of the West Bank winter tomatoes. Export permission must be obtained from both Jordanian and the military occupation authorities. The farmer has to get two export permissions, one from each side with different costs.

Issue certificate The export permission from the Jordanian authorities is called issue certificate and costs 5 JD per certificate. The Jericho marketing cooperative brings these certificates from Jordan. The rate of issuing these certificates affects the price and amount of exported tomatoes. The certificate must be signed by the Jericho cooperative and a special Arab employee who is living in the West Bank. Specific amounts of tomatoes should be included in the certificate, which limits the quantity exported.

The military export permission The military occupation authorities in the West Bank issues this permission for a cost which varies from season to season, typically it is 25 JD. The farmers apply directly for it. The farmers need more than one visit to the so called permission

office, which is in Jericho (about 40 km from the study area) thus requiring more time and cost. Landlords apply for this permission in the case of sharecropping arrangement. Issuing this permission by the military occupation depends on the political situation in the West Bank; sometimes, farmers cannot get these permissions. Having good relationships with the employees who issue these permissions gives the landlord the ability to get the permissions quickly.

Grading and packing There is no station for grading or packing and both are done by the farmers and harvesting laborers. Containers are made locally by small manufacturers and carpenters. There are two sizes, big and small. The big containers (20 kg) are used for shipment in the West Bank and are made in the Israeli factories. The small containers (12 kg) are used for export to Jordan and are made by the small Arab manufacturers in the West Bank.

The prices of the boxes vary from 0.4-0.45 JD/box, and their source is either directly from the market or through the merchant. The reasons for the different prices of boxes depends on the sources of the boxes. For the big landlords they pay 0.4 JD/box but the small owners pay 0.45 JD per box. Finally the case of the sharecropper farmers is similar to the previous and according to the source of the boxes. About 75% of the sharecropper farmers pay more than 0.43 JD/box upto 0.45 JD/box, which is due to their being supplied by boxes from the landlord-merchants.

Boxes are produced in the West Bank by small manufacturers (carpenter stores). The merchants buy big quantities and give to the farmers on credit basis.

Sales commission in local markets The sales commission is one major part of the marketing cost. It can be divided into different types:

1. Sales commission for the municipality obtained from both the seller and the buyer as a fee for using the market for the farmer, it is 3% of the net sales value.
2. Sales commission in the local markets which is paid to the commission agent for his efforts to get the best price for the crop. The value of this commission is different from one farmer to another. It is very high for the farmers who have been provided with inputs from the landlord-merchant and ordinarily for the big landlords. Generally speaking, it is 7-12% of the total sales value. The ordinary sales commission is 7%, but the study shows 69% of the farmers pay 8-12% in the local markets. The different percentage of sales commission in the local market is due to the different types of relationship with the merchants who is the commission agent.

The study shows different situations for landowners:

1. The case of the big landlords who pay the minimum rate of sales commission in the local market which is 7%.
2. The case of the small owner farmers who pay sales commission between 8-12% depending on their relation with the merchant (whether the merchant supply the farmers with inputs on credit basis or not). About 65% of the owners pay 8-12% sales commission in the local markets.

For the case of the cash renter farmers, sales commission is very similar to the land owner farmers. Big renters who are most of the times the big landlords, pay the minimum sales commission, which is 7%. But for small cash renter farmers, the sales commission is between 8-12%, about 57% of the cash renter farmers pay 8-12% sales commission in the local markets.

The sharecropper farmers also pay higher sales commissions than the landlords. About 75% of the sharecroppers pay 8-12% sales commission in the local markets. This case is due to the relation between landlord-merchants and sharecroppers.

Sales commission in the Jordan markets This sales commission is paid to the commission agents in Jordan. Some of the West Bank landlord-merchants own stores and markets (Hisbat) in Jordan, where the sharecropper farmers have to sell their crops. The rate of the sales commission in the Jordan markets is between 5-8%. The ordinary rate is 5% and the higher rates are due to special arrangements between the farmers and the landlord-merchants. According to the study, 64% of the farmers pay 6-8% of the sales commission in the Jordan markets.

The different rates of sales commissions, in the Jordan markets are due to the kind of relation between the farmer and the merchant. Some of the West Bank merchants own markets or act as commission agents in the Jordan markets. Other cases where the West Bank farmers have some sort of an arrangement with the Jordanian commission agents or merchants to sell their crops.

For the case of land owners, the big landlords pay the ordinary sales commission (5%) in the Jordan markets and also few of the small owners pay the same sales commission (5%). About 55% of the owners who are considered small owners and have relations with the merchants pay 7% sales commission in the Jordan markets.

The case for the cash renter farmers is similar to the owners. As big cash renters are most of the time the big landlords so both pay the same rate 5%. In the case of the small cash renters, who could be at the same time sharecropper and/or small owners, pay 6-8% as sales commission in Jordan markets. About 56% of the cash renter farmers pay 6-8% sales commission in the Jordan markets. For the case of sharecropper farmers, 33% of them pay 5% and 67% pay 6-8% sales commission in the Jordan markets. Finally, although, the Jordanian markets are not fully controlled by the West Bank landlord-merchants, in many cases the West Bank farmers pay higher sales commission than the ordinary or than the big landlords.

Market information The market information is the knowledge of the amount of production, market demand and prices. The lack of any daily publications and news severely limits this information. Middlemen and exporters play a big role in supplying the farmers with market information. The marketing agricultural cooperatives provide some market information; However, it is still too limited and is not enough.

Financing In order for the marketing activities to be successful, financing is necessary to maintain their function. There are three major sources of funds: Agricultural cooperatives, landlord-merchants, and the

farmers savings from the previous seasons revenues. The cooperative and the landlord give cash loans to the farmers to maintain the marketing activities.

Tomato marketing margins

The marketing margins are the differences between the price paid by consumers and the price received by the farmers. It is important in showing the marketing efficiency for the produced commodity.

Tomato is an unsuitable product for storage for a long period. Therefore the percentage of waste and loss in tomatoes is about 20%. Constraints on exports worsens the problem. The tomato marketing margins for one kilogram, are shown in Table 15.

TABLE 15. Marketing margins for tomato per kilogram in 1980⁵

item	Value in fils	% of retail price
a) Farm price	68.93	41.35
-container cost	20.00	12.00
-transport cost	5.00	3.00
-Commission 5%	5.05	3.02
-municipality fees 2%	2.02	1.21
b) Wholesale price	101.00	60.58
-Municipality fees 2%	2.02	1.21
-Transport cost	10.00	6.00
-Storage cost	10.00	6.00
-waste value 20%	20.20	12.12
-Bags cost	4.00	2.40
-Profit margin	19.49	1.69
Retail price	166.71	100.00

Marketing Problems

The marketing problems related to the tomato crop for the West Bank Arab farmers are mainly export costs, local marketing and prices. Each of these problems will be discussed separately.

Export problem

The closing of the Israeli markets, and the limitations by the Jordanian authorities are the major two issues related to the export problem. Exports to the Israeli market is not allowed; this prevents the Arab farmers from the opportunity of using the big, nearby markets. Also, the limitations on export to Jordan which are imposed by the Israeli military occupation authorities, especially permissions, is considered another big constraint on export. On the other hand, the Arab farmers cannot export to other countries except to Jordan. From the Jordanian authorities, there are also some limitations, like the amount to be exported and permissions.

This study shows that all of the farmers could not sell all of their crops in 1984 due to the marketing problems. Specifically, none of the farmers could sell any of their tomato crop in the Israeli markets. Ninety-one percent of the farmers said that part of their crop was not sold, while others could not export all of the amount of tomato, which was planned for Jordan.

Local market problems

The competition for the Arab farmers' production in the Israeli markets is an important marketing problem. Since the Israeli settlers receive a government subsidy for production, they can sell at lower prices. At the same time they do not face competition from the Arab farmers in their own markets. Also, the spring tomato produced in the West Bank Heights competes with the West Bank Jordan Valley tomato which results in lower prices.

The study shows that about 11% of the farmers did not sell any of their tomato production in 1984 in the local West Bank markets and 100% of them did not sell any of their tomato production in the Gaza Strip.

Price problems

The problem of low tomato prices face the farmers in both the local and foreign markets. Competition in tomato production in areas of the West Bank (other than the Jordan Valley area), and specially the so called late tomato, has an important effect on the tomato prices. The late tomato production in the central heights causes a surplus in the supply of tomato which leads to a decrease in the prices. Many times, the farmers leave their crop in the field because the cost of marketing is higher than the prices. Also, the large supply of the Israeli settlers crop to the West Bank market lowers tomato price.

According to the prices in Jordan; Jordanian farmers definitely compete with the West Bank Jordan Valley tomato crop because it has the same characteristics, early and late tomato. Moreover, the Jordanian

farmers are supported by the government and receive loans and subsidies from many different sources like banks, cooperatives, and government organizations.

According to the study 91% of the farmers could not sell their tomato crop in 1984, and these farmers considered lower prices as a major factor in not selling their crop. Moreover, 100% of the farmers said that they did not plant more tomato due to low prices.

Cost of marketing

Marketing costs takes about 40 - 50% of the revenues from the sale of tomatoes. This cost is different from one tenure class to another. This variation in cost is due to several factors:

1. Not all the tomato produced are harvested. The portion of the tomato yield harvested is lower for the small owner and cash renter. Only 72-78% of the tomato yield per dunum was sold in 1984. This implies that in general there is overplanting and sales revenue for part of the crop must pay the production cost per dunum for all the crop. Also the rate of the sold tomato is different from farmer to another with respect to the tenure system. The big landlords and the big cashrenters sold a larger proportion of a larger yield of tomatoes than the small farmers and sharecroppers. Thus the large farmers planted more dunums of tomato, got a higher average yield per dunum and sold a larger proportion of what they produced. Table 16 shows the distribution of tomatoes sold in the West Bank and Jordan Valley

by tenure. Table 16 shows that the amount of tomato sold in the case of the big landlords and big cash renters is 6 to 20 times higher than that for the small farmers and sharecroppers.

2. Most of the farmers are sharecroppers and the landlord merchants provide them with the inputs according to an agreement between the two sides. This agreement specifies merchant from whom the sharecropper has the opportunity to buy. This monopolizes the farmer and the merchant is free to charge higher than market costs for such credit sale commissions, and transportation. Also for market commission is charged on all tomatoes harvested, even if the farmer sells the tomato crop along the road not in the merchant store he still has to pay the merchant sales commission. The marketing costs per unit of tomatoes for the different marketing services by tenure are shown in table 17.

Table 17 shows that small farmers and sharecroppers pay about 30% more marketing costs per unit for the major marketing services such as transport, containers, and sales commissions, than the big landlords and big cash renters. Although the marketing cost per unit for the big landlord and big cash renters is lower than the small farmers and sharecroppers they pay more cost per dunum, because they sell a larger percent of tomato and have more yield per dunum. Table 18 shows the distribution of marketing costs per dunum by tenure system. Table 18 shows that the big landlords and big cash renters pay

higher marketing cost per dunum than others. Also sharecroppers pay the lowest marketing cost and this is because they have the lowest yield and sell the lowest percent of their tomato crop among all of the farmers.

3. The Arab farmers pay for extra marketing services; such as export marketing permissions.
4. Lack of financing, subsidies, and cash loans with low interest rates force the farmers pay for their marketing services on a credit basis. This results in higher costs than the cash basis.

Tomato Revenue

The net tomatoes revenue per dunum is calculated by taking off the total costs of production and marketing from the gross sold tomatoes. The prices of tomato are different in each market. The average price of tomato per ton is 40 JD/ton in the local West Bank market and 70 JD/ton in Jordan markets. There is some seasonal variation of tomato prices around these averages. The price is determined by demand and supply in the markets. The time and location of market to which a farmer have access can have an effect on the market prices received. Table 19 shows the net tomatoes revenue by tenure as reported by the farmers.

Table 19 shows that:

1. Big landlords and cash renters received the largest gross tomato revenues per dunum in both, West Bank and Jordan markets. The volume is smaller market price less favorable for small farmers and sharecroppers.

TABLE 16. Tomato sold in West Bank and Jordan by tenure

	Unit	landlord small	and cash renters big	Share cropper
Average yield per dunum	Ton/Du	5	8	5
% not sold per dunum	%	28	25	22
Average tons sold in the West Bank	tons/farm	40	275	13
Average tons sold in Jordan	ton/farm	22	275	19
Average tons sold in the West Bank	tons/Du	1.3	2.5	2.6
Average tons sold in Jordan	Tons/Du	2.3	3.5	1.3
Average Boxes sold in West Bank	Box/Du	72	139	144
Average boxes sold in Jordan	Box/Du	192	292	108

TABLE 17. Tomato marketing costs

marketing services	Unit	landlords small	and cash renters big	share
Local transport	JD/box	0.2	0.15	0.2
Haul to Jordan	JD/box	0.13	0.1	0.15
Export permission from West Bank	JD/load	25	25	25
Export permission to Jordan	JD/load	5	5	5
Containers	JD/box	0.45	0.40	0.45
Local sales Commission	% sales	9	7	8
Jordan sales commission	% sales	7	5	7

2. Landowners and cash renters may have the best access to Jordan market because they both receive most of their gross revenue from selling in Jordan markets. Sharecroppers receive most from West Bank markets even though the price is lower.
3. Reported and calculated net tomato revenue per dunum is positive for the big landlords. It is near zero or negative as by sharecroppers and small farmers.

The smaller net revenue calculated for small farmers than for sharecroppers could be due to under reporting of sales. Sharecroppers would be expected to get less net revenue not more than small farmers. Eventhough, the survey shows negative results in net revenue for small

TABLE 18. Marketing cost per dunum by tenure

marketing services	Unit	Landlord and cash renters small	big	Share cropper
Transport to Jordan	JD/DU	24.96	20.80	28.86
Transport to West Bank	JD/DU	14.4	29.2	16.2
Export permission to Jordan	JD/DU	0.76	1.16	0.43
Export permission to West Bank	JD/DU	3.83	5.83	2.16
Containers	JD/DU	86.4	116.8	48.6
Local Sales commission	JD/DU	2.3	3.4	4.0
Jordan sales commission	JD/DU	6.7	7.3	3.8
Total cost	JD/DU	139.35	184.4	104.0

TABLE 19. Gross and net revenue for tomatoes by tenure groups

	Unit	Landlords and cash renters small	big	Share cropper
Total gross tomato revenue	JD/DU	213	345	195
Gross revenue in West Bank	JD/DU	52	100	104
Gross revenue in Jordan	JD/DU	161	245	91
Total cost	JD/DU	243	265	193
production cost	JD/DU	104	81	89
marketing cost	JD/DU	139	184	104
Tomato net revenue	JD/DU	-30	+80	+2

owners probably they break about even but underestimate the yield per dunum and underreport the amount actually sold per dunum. It is possible that small farmers were unclear who see the survey results and were afraid to give the full correct data. For yields many gave only a range of data. Because of taxes, they may have been afraid. Winter vegetables including tomatoes generally provide Jordan Valley rather large positive cash flow above cash production costs and marketing costs. Thus while the production costs are probably accurate, it is probable that volume of sales are underreported.

THE JERICHO COOPERATIVE FOR MARKETING AGRICULTURAL CROPS

This cooperative was established in 1959 for the purpose of providing marketing services. Its main functions are collecting the members crop and selling it, and giving seasonal cash loans to the farmers. The services of this cooperative are limited to its members. The members consist of small farmers, landlords and renters.

There are about 1400 individual members in this cooperative distributed over the Jordan Valley with about 503 individual members. The study area has two branches, including one at Jeftlik --one of the study villages.

Services Provided to the Members

The Jericho coop does not provide all of the expected marketing services. It provides the following:

1. It secures all the export permissions from Jordan for farm products.
2. It supplies seasonal cash loans to most members including landlords. Our study shows 78% of the farmers in our sample received cash loans from the cooperatives in 1984. The amount of each cash loan is directly proportional to the size of the farm, all loans are 10JD/dunum, at a 4% interest rate.
3. It should provide extension information services to the farmers about marketing and production. However only 4% of the farmers said they had received any extension service.

These services provided by the Jericho cooperatives are not enough to satisfy the farmers. In our sample some farmers said that the cooperative is functioning only as an export middleman between the farmers and Jordan government. They utilize the loans as a financing resource, but say the coop is too much like a small Bank. The farmers object to paying back loans and object to the 4% interest as too high a rate for them to pay.

Management

The administrative committee or board of directors for the cooperative is of seven members elected by the members.

The farmers are not represented effectively in the cooperatives. The committee members are distributed as follows:

Landlords	5
sharecropping farmer	1
other	1

Clearly the landlords control the Jericho cooperative. These landlords are themselves merchants and make a profit as they supply the farmers with inputs. The one sharecropper farmer on the board of directors cannot affect coop policy. The "other" member of the committee is a representative of the Agricultural Engineers Association. He is there because law says the Agricultural Engineers association must always have one member on the coop administrative committee. Most of the administrative committee members do not live in the Jordan Valley. They live in Jerusalem, and Rammallah. Five of the members have finished post-

high school education, while the other two had finished only upto the high school level. The director of the cooperative is an agricultural engineer. There are three agricultural engineers employed by the cooperative -- one each at three branch offices. Decision making is done in the presence of all of the committee members and the director of the cooperatives. The director plays the most effective role in the cooperative because of his daily appearance in the office.

Survey Data about Roles Which the Agricultural Cooperatives Should Play

For cooperatives to contribute to development and effective voluntary social institutions, they must be able to satisfy its members. Satisfaction should be a result of service received. Services supplied by this cooperative to its member farmers do not seem to satisfy the members. Sharecroppers say lowered cost of inputs and better quality services are required of the coop for it to be able to compete with the merchants and replace them.

This study shows that 98% of the farmers asked for more production services, 100% asked for more cash loans and marketing services, 95% asked for more production and marketing information and 95% asked for more extension services to be provided by the cooperative. It is clear why 92% of the farmers said that the cooperatives cannot replace the merchants at this time. They said however that the coop could replace the merchant if it were to provide all the necessary services. This study estimates the following reasons why the cooperatives has not been able to replace the merchants.

1. The coop does not function well because the management and the administrative board are controlled by the landlords and merchants.
2. The coop is weak because it is small in size. The coop has little ability compared to the merchants in securing and providing needed production inputs and marketing services.
3. The coop is ineffective in gaining access to the markets.
4. The coop lacks of capital and therefore they cannot use it.

In order for the cooperatives to be effective the respondents of the survey say it must:

1. Provide inputs at lower cost, and better quality than the merchant.
2. Find markets so tomato production can expand.

Finally, 92% of area farmers who are members of this cooperative are only partially satisfied with the cooperative and its services. They believe that landlords and merchants are the customers of the coop and control the cooperative, and definitely limit the development and improvement of the coop and its services to sharecroppers.

Although agricultural cooperatives here existed on the West Bank for 60 years they are decreasing in membership. Current agricultural coops are not considered by sharecroppers to be able to provide the necessary services as well they are currently provided by merchants. Non-ag. coops. seems to more successful because they provide a source of local collective public service to Arab residents in lieu of local government. Restrictions

on coop relationship to Jordan by the Israeli military government plus choices by landlord dominated boards of directors combine to restrict West Bank ag. coops. Potential contribution to economic development and sharecropper level of living.

CONCLUSIONS

From this study we have concluded there is further physical and resource potential to expand the West Bank economy by more extensive and intensive cultivation of winter tomatoes. However, production is already in excess of harvest and sales potential. The current market is over supplied. Protective trade policies of Israel and Jordan effectively limit the West Bank to a residual supplier.

There is significant opportunity within the existing market volume to increase the cash income and real income of sharecropper families. Overplanting should be avoided and reductions in input prices and in marketing margins.

Extension of winter tomato production is possible. More area could be planted. Suitable land is available. Family labor for pre-harvest and hired labor for harvest is also available.

More intensive production using the same or less water to produce the more tomatoes is also possible. Current output is not limited by either current use of resources or full realization of potential yields or high resource productivity.

From our survey the sharecropper farmers reported they could handle 25% to 35% more tomatoes with their current family labor. Landlords reported they could provide water to 20% more. Nearly all respondents reported ability to plant and care for more tomatoes than he had planting permissions and more ability to grow and harvest tomatoes than he could sell. The volume of planting permissions issued seems to exceed the volume

of marketings actually realized by 25% to 45%. Merchant landlords and sharecroppers report 22% to 28% of production not harvested. The limited permissions to plant avoids some resource waste by preventing even greater excess of planting over marketings. Further restricting plantings would increase West Bank GNP by reducing imported inputs.

West Bank is a residual supplier of winter tomatoes. Entrepreneurs maximize return in an uncertain and variable market by a deliberate strategy of overplanting. By overplanting, entrepreneurs have a chance to gain from large marketings and lose little from the larger than needed production costs. It appears the cost of excess plantings which is mostly pre-harvest labor, seed and fertilizer costs fall relatively heavily on the sharecropper. The entrepreneur makes a profit on each unit of input supply provided and upon each unit of output marketed. Better information upon which to plan the most appropriate volume of winter tomatoes is needed. The sharecroppers need to be guided in planting decisions. The current choice of planting land favors the entrepreneur at the expense of the sharecropper.

The means to achieve the changes required are not clear. Price and gross receipts for winter tomatoes at wholesale are probably about at a maximum given government policies in the region. The aggregate sharecropper cash and real income could be improved by 1) avoiding overplanting and managing to plant only enough area to provide with reasonable confidence the most likely saleable tonnage, 2) using more fertilizer and water per unit area relative to labor and thus raise the

yield per area until the input level and mix on each unit area produces output at minimum real cost per ton of tomatoes and by 3) reducing per unit input prices and market services prices per ton until these necessary elements are obtained at actual cost when delivered in an efficient manner.

Intensive Opportunity

Increasing the yield per dunum, or raising productivity, of resources in tomato production could result not only in more production but also reduce cost per ton and contribute more to the West Bank GNP.

Technology is a major factor in productivity in tomato production. Greenhouses or plastic houses are the most advanced technology. They give the highest yield per dunum, 10-12 tons compared to 3-6 by plastic tunnels. Other technology includes using the necessary qualities and quantities of fertilizers and pest control to improve tomato quality. Reduced cost per ton and increased value per ton are both possible with appropriate technology.

Supplying the necessary quantity of irrigation water to the land and most suitable intervals will result in more yield per dunum and per cubic meter of water. The drip irrigation system is now used in the West Bank Jordan Valley. However, sometimes the necessary quantities of water are not available when needed. Sometimes water can be had only at 8 or 10 day intervals. Inefficient water use also lowers the productivity of labor and fertilizer and raises the cost per ton of tomatoes.

Local Substitutes for Imports

Local production inputs, such as plastic mulch, plastic tubes, fertilizers, and chemicals might add to the West Bank GNP. Using more local materials could decrease the import bill and raise GNP. Natural fertilizers, sheep, cows, and chicken manures instead of chemicals is a good example.

Production Input Costs

Lower prices for purchased inputs such as fertilizers, plastic, seedling, and pest control seems possible and would result in more net cash return to the sharecropper family. The cost of production inputs takes a major share of the gross receipts from the tomato crop. For example, decreasing the price of fertilizer per sack by one JD would be equivalent to a 1% increase in tomato average per dunum sharecropper net cash income. Inputs bought by sharecroppers are not obtained near market price. Inputs at cost would provide a much higher return to the family. For example, a family farming 25 dunums uses about 100 sacks of fertilizer per season each JD less for fertilizer will result in 100 JD more per season to the farmer. 100 JDs more would raise a typical family income by 4%. The supplier of inputs currently has a monopoly. The landlord imposes a single source of inputs on his sharecroppers. He can do this effectively because of the credit he provides or as a condition sharecropping to obtain land and water.

Marketing Costs

Marketing the tomato crop generates net return to merchants, truckers, commission agents, and auction markets. The marketing costs should be no larger than necessary to have more sharecropper family net income.

Tenure Systems

Owners and cash renter farmers have more freedom to shop around and bargain for lower priced inputs. The monopoly relationship of the merchant with sharecroppers precludes this. Big owners and big cash renters obtain inputs at 25% lower costs than sharecropper farmers. Only if enough credit and collateral is available to owners and cash renters can they escape the monopoly relationship. 20% higher prices for production inputs and marketing services are paid by farmers according to their tenure system.

Inputs and marketing need to be provided at cost to all producers either by agricultural cooperatives or by more effective competition among landlord merchants. Limited employment and desire to maintain residence on the West Bank make sharecroppers vulnerable to high costs.

The Israeli military occupation to the West Bank is a major constraint for development. Development programs or projects must obtain approval from military occupation. The possibility of export, import, and development investment capital is very limited under the occupation.

However, the Palestinian people may be obsessed with struggling and resisting the occupation that they fail to realize full value of limited opportunities. During the occupation the Palestinian farmers face more

limited markets, of course. This is why they should find the most suitable ways and methods to take advantage of the limited possibilities they have to use the land, their labor and imported production inputs. One way of minimizing the pain of occupation is cooperation between landlord, merchant, sharecropper and agricultural cooperatives. The agricultural sector is very important for the Palestinians. They need to make the best collectively use possible of the limited market opportunity. Planning to avoid excess costs would be an effective overall development project and further rapid progress could then be made in the future under a Palestinian national independent state.

ACKNOWLEDGEMENTS

My first and abiding is to Prof. Arnold Paulsen, my advisor for his knowledge and understanding of economic science, and especially for his patience, accessible, and encouraging support. Without his untiring assistance and availability, this work would not have been completed.

Special thanks to committee members Dr. Paull Lasely, and Dr. Roger Gender, for their advice and commentary.

Special acknowledgement is due to my wife Basma Abu Sway (Department of Sociology), for her assistance in developing specialized programs for computing analysis. I am taking this opportunity to express special appreciation to her and to our lovely daughter Karmel, who have been a constant source of encouragement throughout this study.

Thanks also to my friends Seham, Osama, Saeed, and Sami, and sisters Khadijah, and Khitam for their help in interviewing the farmers and collecting the data. Special appreciation is extended to the farmers who were very cooperative and generous in providing the required information. Thanks also to my family, parents, and sisters for their unfailing encouragement and support. To my friends Gale West and Dr. Christine Brown for their help in editing my thesis.

To my typist, Mr. L. Viswanath for his ability to decipher my handwriting and turn it into a fine product. I am grateful to USIA for sponsoring my study at ISU.

APPENDIX A: WEST BANK AGRICULTURE AND WATER RESOURCES

The West Bank is similar to other less developed countries. About 50% of the population depend on agriculture directly or indirectly. Agriculture effects the standard of living for many people. To raise the standard of living of the farmers, one needs to find larger outside markets, provide all necessary inputs and develop advanced production methods like irrigation and green houses.

Geographical Background

The West Bank has four agricultural areas, Semi-coastal region, central uplands, eastern slopes, and the Jordan Valley (see Figure 7).

Semi-coastal region

This area lies in the northWest of West Bank, and includes two sectors, Jeneen and Tolkaram. It receives the highest average annual rain between 400-700 mm. This region extends for about 60 kms in length and 3-12 km in width and about 400 thousand dunums. We find relatively small area (mainly in the south) has irrigation producing citrus plantations and summer vegetables. A mixed type of farming is practiced with cereal crops covering most of the cultivated area in winter, followed by vegetables in summer.

The central upland region

This region, the largest in the West Bank, consists of about 3.5 million dunums and extends from Jeneen district in the north to Hebron in

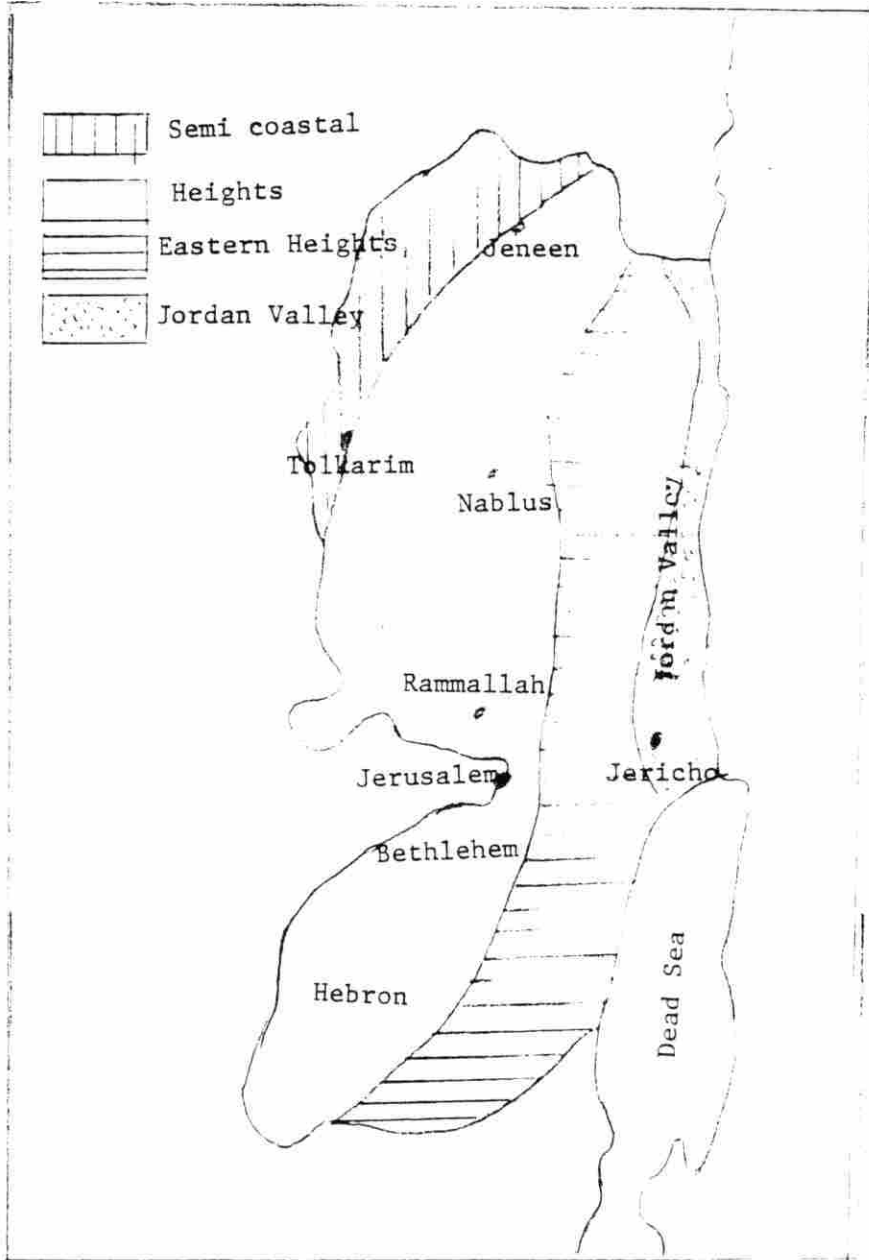


FIGURE 7. Agricultural Areas of the West Bank (Istanbouly et al. 13, p. 32)

the south. About 120 km in length, and 10-30 km in width, it includes Nablus, Rammallah, Jerusalem, Bethlehem, and Hebron districts. Most of this region is mountainous, depending on a total annual rainfall between 300-600 mm. The cultivated area consists of about 1 million dunums, about half of which is planted in cereals, while the other half consists of orchards and groves, 80% are olive groves, but in the south about 100,000 dunums are planted in vineyards and deciduous trees such as apples and plums.

The eastern slopes region

This semi-dry region receives not more than 250 mm of rainfall annually. It extends the length of the eastern side of the West Bank from east of Jeneen district very close to the West Bank up to the Dead Sea, and then includes all of the western area of the Dead Sea. About 5-10 km from the populous areas. This area includes the eastern part of Hebron, Bethlehem, Jeneen, Jerusalem, Nablus, and Rammallah. Its width varies between 10-20 km and it contains about 1.5 million dunums. A large part of this area has been confiscated by the Israeli military for the building of settlements overlooking the Jordan Valley. It is largely used for grazing of sheep and goats. Cereal crops are not considered because the land is steep and consists of discontinuous Strips, Valleys, and terraces.

The Jordan Valley region

This area extends on the Jordan riverside from the so called green line (1967 borders) in the north to the Dead Sea in the south by 70 km

length and 1-12 km width with 400,000 dunums total acreage. The whole area lies between 200-300 meters below Sea level. This area consists of the major agricultural region of the West Bank. In the past, approximately 200,000 dunums have been under intensive cultivation in the Valley, 40 thousand dunums used by Arab farmers and 50 thousand by Israeli settlements. However, only 60% of this area is presently utilized due to the lack of markets, limited access to the water and confiscation for different purposes. This area receives less than 150 mm annual rainfall and it enjoys warm winters and hot summers. Therefore, all of the cultivated area is irrigated by the limited water supply derived from the springs, wells, and water drawn from the eastern slopes. The main crops in this area are off-season crops: citrus, bananas, and winter vegetables.

Agriculture in the West Bank Economy

Agriculture holds an important part in the West Bank economy. The agricultural sector includes the largest percentage of the labor force in the West Bank, but this percentage has decreased from 42.5% in 1972 to 33.3% in 1980. This is due to several factors like confiscation of agricultural land, and other problems facing the agricultural sector to be discussed below. Also agriculture has provided an average of 39% of the West Bank GNP between 1968-1979, as shown in Table 20.

Yet despite the prominence of agriculture in the economy, the West Bank has been an importer of agricultural products. The value of the agricultural production has varied from one product to another and from one

year to another, due to supply and demand, marketing and total production. The production of olive oil has had the most influence in determining the value of the agricultural production.

TABLE 20. Agriculture in the West Bank economy at its prices¹²

(millions)

Year	Agriculture Production	West Bank GNP	Agriculture production %
1968	134.9	333	40.5
1969	175.1	384	45.5
1970	160.5	411	39.0
1971	204.3	467	43.7
1972	243.5	572	42.5
1973	240.3	516	46.5
1974	381.4	680	56.0
1975	266.6	650	41.0
1976	351.0	759	46.2
1977	1381.0	6285	21.9
1978	3222.0	11493	28.0
1979	4722.0	20194	23.3

Population and Labor Force

In 1967, about 200 thousand Palestinians immigrated to Jordan due to the war and the Israeli military occupation of the West Bank and the Gaza Strip. According to the Israeli Statistical Abstract for 1983, at the end of 1982 there were 747.5 thousand Palestinians living in the West Bank and 476.3 thousand living in the Gaza Strip. About 608.9 thousand were in the labor force, 374 thousand in the West Bank and 235.4 in the Gaza Strip, which are 49.9 and 49.5 percent respectively of the total populations.

Labor Force

The labor force of a population is usually considered those ranging in age from 14-64, except for those exempted for different reasons such as students, disabled etc., and the unemployed. In underdeveloped countries, people under 14 and over 64 are not considered to be in the labor force, and this is true for the West Bank also. Such factors as economic pressures and wages contribute to the participation of these groups in the labor force. Table 21, shows the population aged 14 and over.

TABLE 21. Population aged 14 and over¹²

% employed persons of labor force	% labor force of population aged 14 +	Labor Force unempLOYed thousands	emplOyed	total	not in labor force	Population aged 14+	Year
Total Population							
89.2	30.1	10.1	83	93	216	308.6	1968
96.7	36.7	3.8	115	118	205	323	1970
98.8	36.5	1.6	132	134	233	367	1975
99.0	33.7	1.3	133	13	265	399	1979
98.3	34.2	2.4	135	137	264	401	1980
98.6	33.6	1.9	133	135	268	403	1981
98.7	35.2	1.9	141	143	263	406	1982
Males							
88.1	56.0	9.3	70	79	62	141.5	1968
96.4	61.4	3.4	91	94	59	154	1970
98.9	62	1.8	108	109	68	177	1975
99.0	56.9	1.1	109	83	193	1979	
98.2	57.7	1.8	110	115	82	193	1980
98.7	57.8	1.4	110	112	82	194	1981
98.7	60.0	1.5	115	117	78	194	1982

From Table 21 we can see that only 30-36% of the population were in the labor force from 1968-82, which means that about 65-70% of the total population were depending totally on this percentage of the labor force. We can also see that 88.1% of the employed are males and only 11.9 percent females. Because of traditional values that frown on women working outside the home, most of the females in this age group are housewives.

Decrease in employment in the agricultural sector is normally associated with improved technology like the drip irrigation system, green houses, and machines. But this is not totally the case in the West Bank. The job opportunities in the Israeli labor market are the most important factor, because the opportunity cost of working in the agricultural sector in the West Bank is very high.

We should also mention the large number of farmers who work as seasonal laborers in the Israeli markets and maintain small farms as well. Others work a few months as laborers after they finish the agricultural season.

Distribution of Agricultural Land Holdings

In the West Bank, land is privately owned. Farming is done by the owner himself, and/or in combination with wage labor, or by sharecropper or rentees. The system of land ownership creates different problems. While 34% of the farmers own less than 20 dunums, 38% own more than 100 dunums. The small farmers can't use their land totally because of the smaller size of their holdings, which limit their use of machines and technological

methods, at the same time those who own big farms can't farm them by themselves, due to the lack of workers and financial resources.

Table 22 shows the distribution of the agricultural land holdings in the West Bank as it was in 1971.

TABLE 22. Distribution of agricultural land holdings¹²

Dunums	Total area dunums	% of total area	# of owners	% of total owners
1-5	24800	1	9167	16
6-20	195800	9	18775	32
21-50	499700	24	17215	30
51-100	579500	28	8025	14
100 +	791000	38	4902	8
Total	2091100	100	58084	100

Land Use

The land use in the West Bank is determined by climate and natural geography, rather than people's need for different kinds of agricultural production (see Figure 8). Table 23, which shows the distribution of the total land in Palestine by type of agricultural production, irrigated and cultivated land, confirms that about 70% of the total cultivated land in Palestine is located in the area that has been occupied since 1948 which is now called "Israel". About 27% of the total cultivated land is found in the West Bank area and 3% in the Gaza Strip.

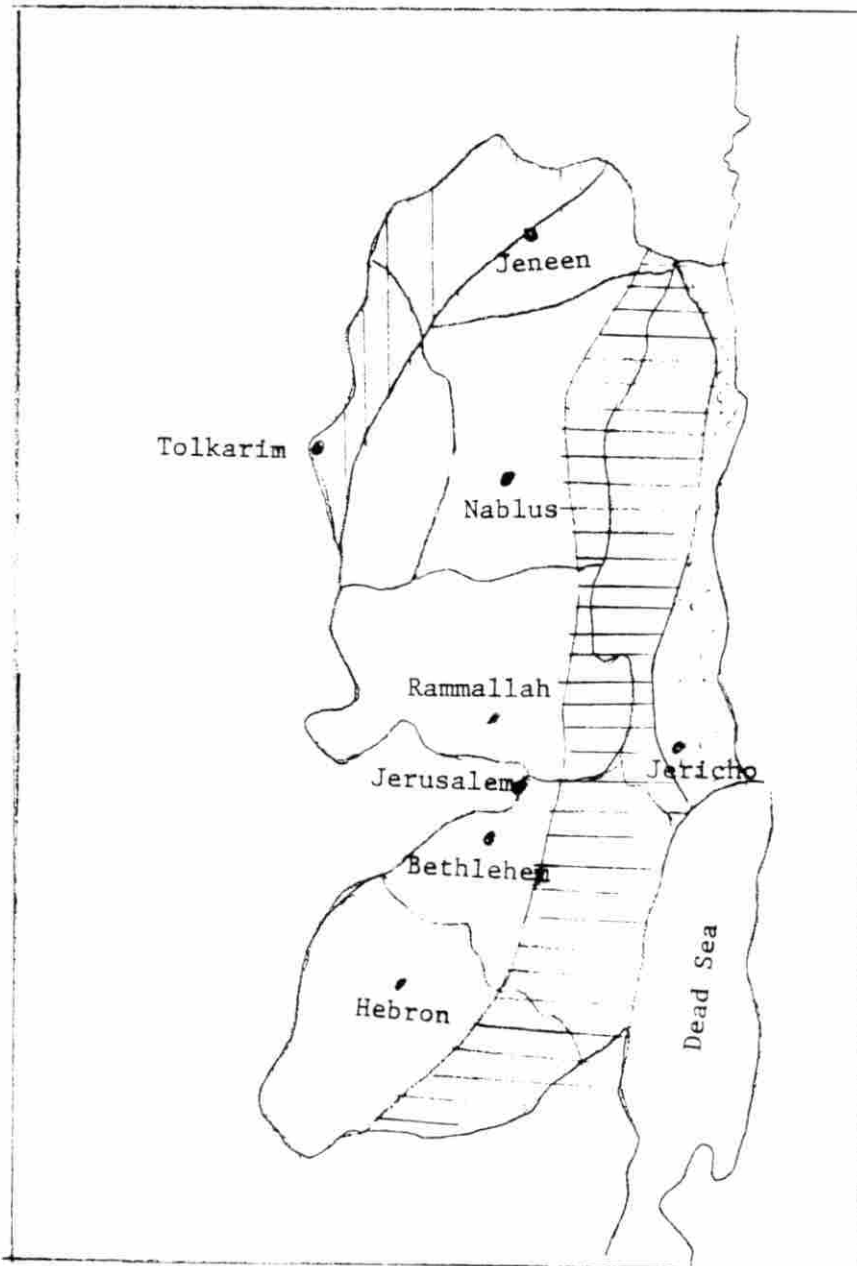


FIGURE 8. West Bank Administrative Districts with the Agricultural areas (Istanbouly et al. 13, p. 22)

The distribution of the farm land in the West Bank varies according to land confiscation, transfer of farmers to the Israeli labor markets and problems that face the agricultural sector. Table 24 shows that there is a decrease in the cultivated land between 1967-79, and a change in the total amount of the agricultural production from one year to another and from one crop to another. The most important shifts are the reduction (from 1967-1979) in the amount of field cropland of about 360 thousand dunums, the rise in the fruit category including olives and other orchard crops, and the rise in the amount of the irrigated land.

TABLE 23. Distribution of irrigated and cultivated land in Palestine in 1978-79 (in dunums)¹³

	West Bank	Gaza Strip	Israel	Palestine
Total area	5755000	350000	20122000	26227000
Cultivated land	1615800	170000	4270000	6056100
% cultivated land	28	48.7	21.2	23.1
Irrigated land	87400	102300	1890000	2079700
% irrigated land	5.4	60.1	44.3	34.3

The most important reason for the reduction in the land use is the decrease in the labor inputs since, as noted previously thousands of agricultural workers transferred to work in the Israeli labor markets.

The rise in irrigated land in the West Bank reflects an improvement in the technology. But the total amount of the irrigated land is still low, although about 85,000 dunums were irrigated before the Israeli military

TABLE 24. Distribution of farm land in the West Bank¹²

(thousands of dunums)

	67/68	68/69	69/70	70/71	75/76	76/77	77/78	78/79
Total area	5755	5755	5755	5755	5755	5755	5755	5755
Cultivated	1683	1858	1723	1719	1602	1547	1615	1609
% of total area	29	32	30	30	28	27	27	28
Irrigated	-	57	-	-	89	87	87	85
% of total cultivated	-	0.03	-	-	0.05	0.06	0.05	0.05
Types:								
Field crops	890	1072	902	915	539	499	530	530
Melons and pumpkins	113	101	111	94	107	107	112	98
Citrus	20	20	22	22	26	29	26	26
Fruits	660	665	689	687	931	912	949	954

occupation of West Bank in June 1967. The decrease in the amount of irrigated land in West Bank is due to several reasons¹⁴:

1. Loss of water resources, like wells, to the occupation authorities.
2. The confiscation and closure of land for security reasons, especially in the fertile Jordan Valley which depends on irrigation for planting.
3. The destruction of irrigation equipment and canals in the hostilities during and after the June 1967 war.
4. The metering irrigation water in the West Bank by the Israeli military government. Each well has an assigned amount of water which may be pumped from it in a year. If the amount of water is exceeded, the offending farmer may face a trial before a military judge and fine.

Water Resources

Water is considered one of the most important economic resources for any country, especially for under developed countries in the Middle East

which depend on water. Water is one of the main factors in the Arab - Zionist struggle in the Middle East. But water is doubly important for the Palestinian people because its access literally determines their ability to make a living from their land. In order for the Palestinians to survive, they must own the water resources. Thus access to water resources is important.

Geographic background

In order to understand the problems of water distribution on the West Bank, we must see them in the context of the geography of the hydrology of Palestine as a whole. Palestine is divided into three¹⁹ topographic units, running roughly north-south: the coastal plain along the Mediterranean Sea in the West, a hilly region in the center, and the Jordan rift Valley in the east (see Figures 9, 1).

Its width varies from 15 km in the central part of the country to 20 km farther south of the latitude of Jerusalem. It is about 50 meters above Sea level. The transition from the coastal plain to the central mountains is sharp in the north, and occurs through an interim area of low foothills. The West Bank is located in the central hill area between Marj Ebin Amer north of Jeneen in the north, and the Beer e Saba' Valley in the south, and also includes part of the Jordan Valley between Beisan Valley in the north and the Dead Sea in the south, and small areas in the coastal plain near Tolkaram and Qalkilia. "The West Bank lies astride the main watershed between the Mediterranean Sea and the Jordan River, chiefly on the Western side of the watershed, at elevations approaching 800 meters above Sea

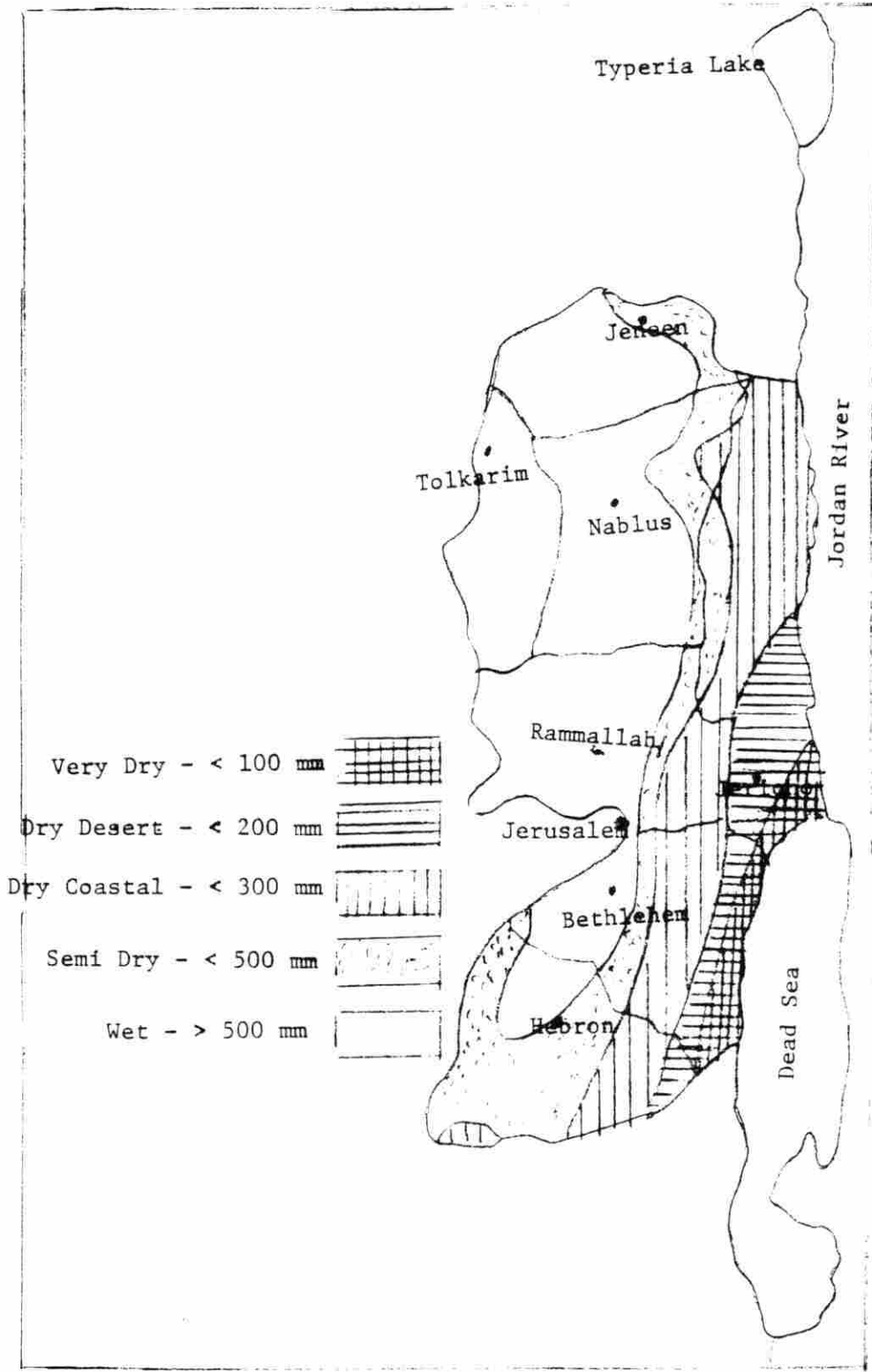


FIGURE 9. Climate Areas Of the West Bank (Istanbouly et al. 13, p.23)

level. A few small plains along the central ridge slope down to both West and east in terraces, but the slopes on the eastern side of the watershed are three times as steep as on the Western side"¹⁹. The Western slope south of Jerusalem is characterized by two terraces, followed by a hilly area composed of chalky edcene limestone. North of Jerusalem, the Western slope down to the central plain has one terrace. On the eastern slope, the southern section has five to six terraces down to the Jordan Valley, and the northern section two or three.

The Jordan Valley on the eastern border of Palestine forms the northern most part of the Syria-African rift Valley. The base of the Valley is composed of small layers and along the Western margin of it brought down during the flood accumulated. Widening from north to south, it has two terraces the flood plain of the Jordan river, or Zhor in Arabic, and the rest of the Valley, called Ghor.

Located between the low rainfall area of Egypt to the south and southwest and the high rainfall area of Lebanon to the north, Palestine receives different amounts of rainfall with respect to the different regions. The southern part of the country is arid, with less than 300 mm of rain per year, while the north receives as much as 700-1100 mm per year. The Western slope of the West Bank have an annual rainfall of 300-650 mm per year, decreasing gradually on the eastern slope, to an annual rainfall of 100-500 mm per year. The rainy seasons occur from November to May, with maximum rainfall in January, and there is a considerable deviation from the average rainfall from one year to another. So in the West Bank, rainfall

can provide enough water for agriculture, but not in other parts of the country like the Gaza Strip, Jordan Valley and the central plain. So irrigation should be the most common way of agriculture. "Irrigation requirements for typical modern agriculture amount to 1000-1500 mm per year in the Jordan Valley and 500-700 mm per year in the Gaza Strip"¹⁹.

As a result of the above geographic conditions, surface water is scarce. The Jordan river provides only a third of the country's water requirement, and since the Arab farmers are prohibited from using it, they must depend on ground water as their major water resource.

Water sources of the West Bank

Water sources location and character of the West Bank is determined by the physical structure of the area. The main water sources for the West Bank are rainfall, ground water basins and natural outlets and springs.

Rainfall, evaporation and runoff Rainfall is considered the origin of water sources in the West Bank (see Figure 10). It is distributed as follows: Part goes into the ground and replenishes the aquiferous formation, which finally becomes springs. Another part flows as surface runoff and drains to water courses as flash floods. A major part of the rainfall returns to the atmosphere as evaporation.

The surface runoff in the West Bank is composed of flash floods and springs. Of an average of 105-165 million cubic meters per year of surface runoff, about 25 million cubic meters flow Westward. "Owing to the Karstic nature the high stability of rock in the water creates underground features such as caverns, sinkholes, and "lost" rivers of most of the outcrop in

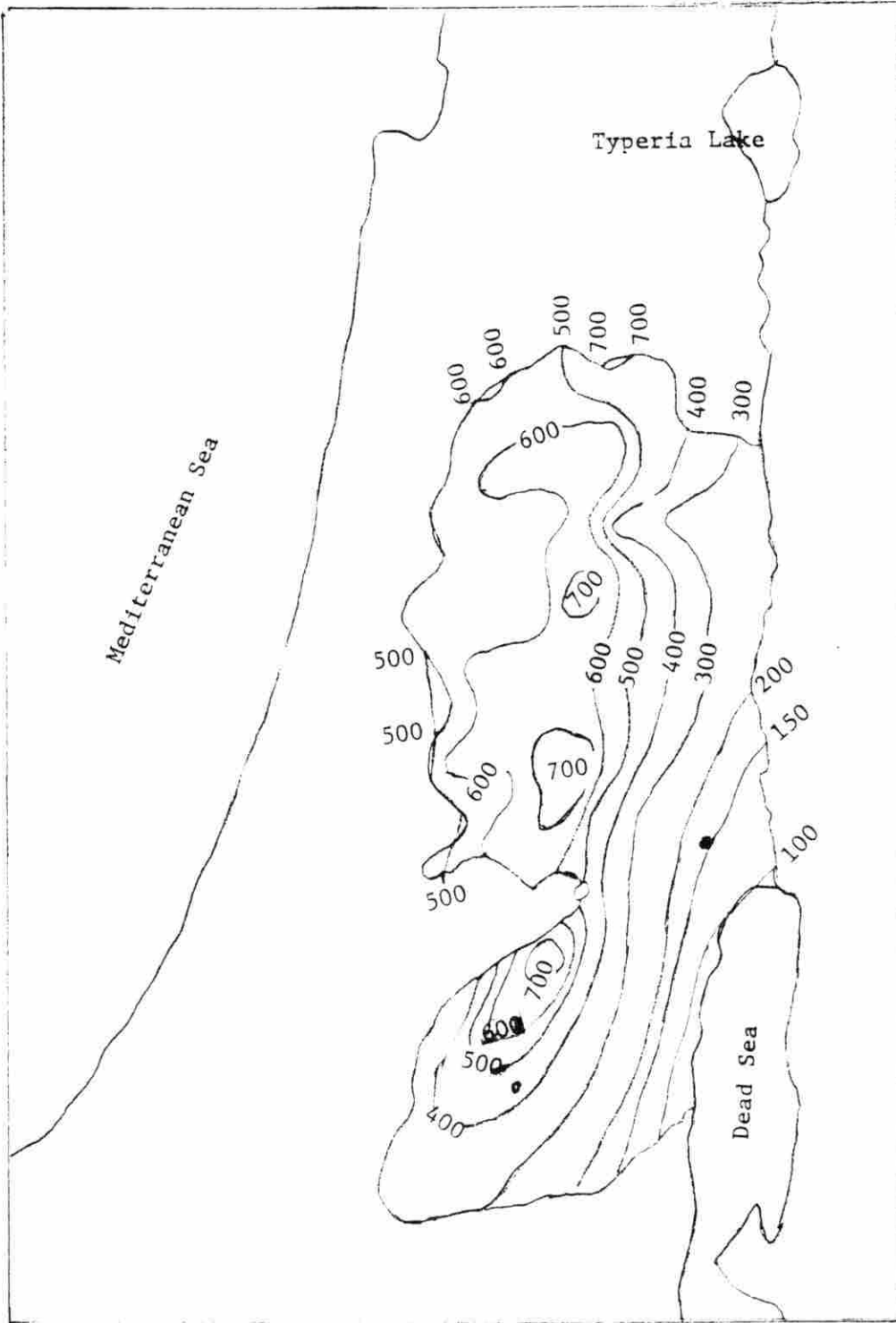


FIGURE 10. Rainfall in the West Bank (Istanbouly et al. 13, p. 17)

the upper part of the catchment basins, the flood waters runoff is minimal, usually not more than 1 or 2 percent of rainfall. According to various estimates, the flood water runoff in the area averages between 30 and 50 million cubic meters per year, of which 20 mcm flows West of the watershed and the rest flows eastward. Springs drain the groundwater basins, it is estimated that the total discharge of the springs which issue within the West Bank is 75-115 mcm per year, of which the bulk flows eastward and about 5 mcm flows westward"¹⁹. The result of the runoff water on the agricultural sector is very bad as it uncovers the slopes (most of the West Bank area) from the surface soil, and this water is useless as it does not go into the ground.

The evaporation rate varies according to climatic conditions. "The annual evaporation in the West Bank averages between 1900 mm per year in the Western slopes of the watershed to 2600 mm per year on the shores of the Dead Sea. The highest monthly average is in July, with 8 mm per day on the Western slopes and 11 mm per day in the Jordan Valley"¹⁹.

The Aquifer System

The aquifer system in the West Bank is composed of several rock formations from different ages, and includes limestone, dolomite, and marl formations. The type of rock varies from one area to another. In limited areas, it is comprised of clastic rocks like sandstones, conglomerates, and clays; and in the Jordan Valley, they are mainly continental deposits of Neogene to recent age. The various formations generally occur in a series of aquifers and aquicludes as follows:¹⁹ (see Figure 11)

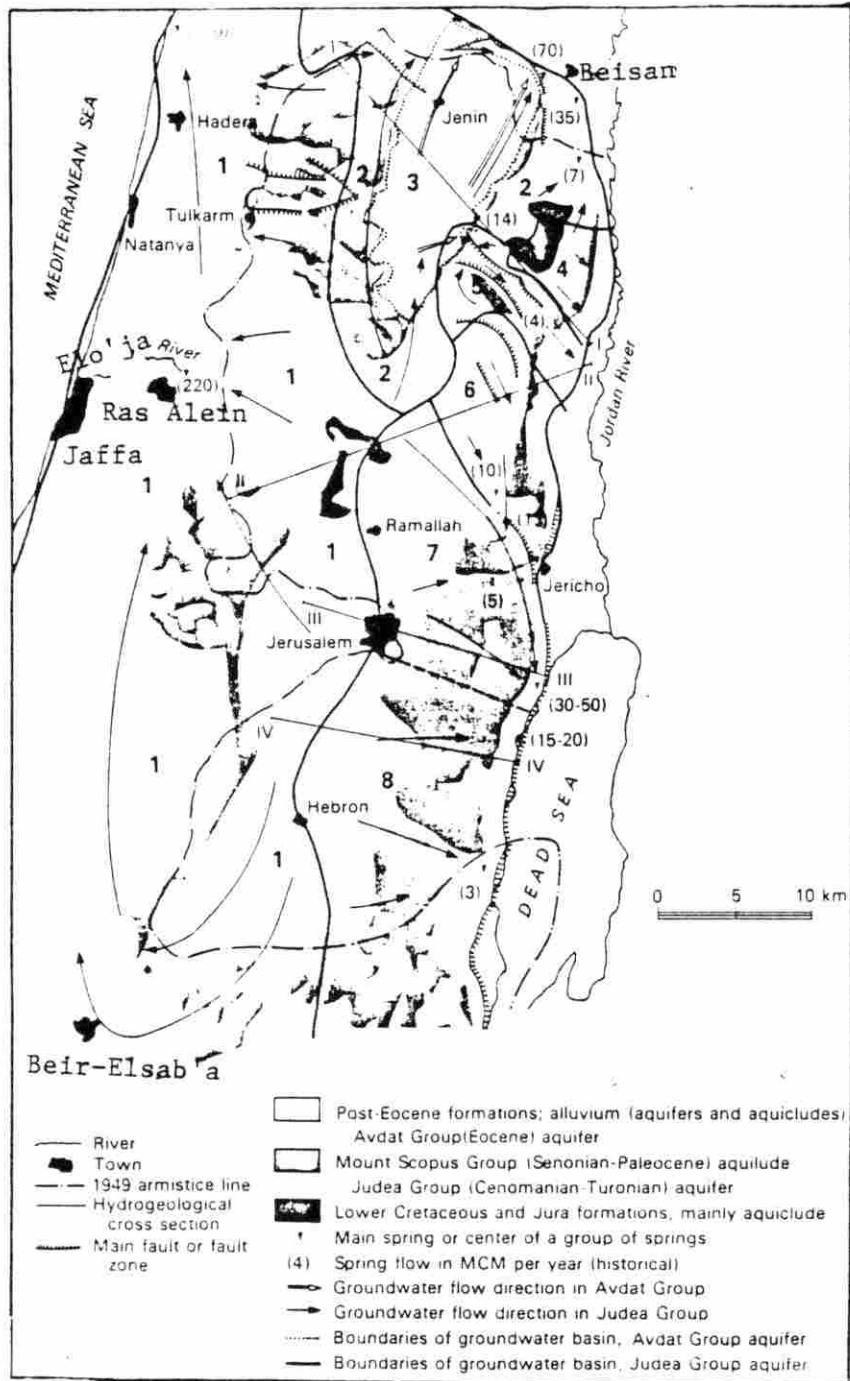


FIGURE 11. Hydrology of the West Bank (Schwarz, 19, p. 86)

1. Kurnub group aquiclude, of Albian age. The section is mainly marl with some limestone horizons, and the thickness is upto 300 m.
2. Ajlun series (in Figure 11 known as Judea group), aquifer of Turonian and Cenomanian age. The section is dolomite and limestone, with interim chalk and marl formations. The formation thickness is 400-900 m, but only part of it is below water table.
3. Belqa series aquiclude (in Figure 11 known as Mt. Scopus group), of Senomanian-paleocene age. The section is of chalk and marl, and the thickness 150-250 m.
4. Jeneen subseries of the Belqa series (in Figure 11 known as Avdat subgroup of Mt. Scopus Group) of Eocene age. The section consists of chalk and limestone, with a thickness of 200-250 m. This layer may form an aquifer according to the proportion of chalk in the rock. In the large Nablus-Jeneen syncline, however, this section forms the major aquifer.
5. Local aquifers and aquiclude of Neogene and Pleistocene age. Conglomerates, marls, clays, and sand of thickness from a few meters to hundreds of meters are found in the Jordan Valley.

Figure 11 shows the distribution of the aquifers all over the West Bank area, ground water flow direction in each area of the West Bank and hydrological cross section. The Ajlun series is the major one, having the largest outcrop area and the largest replenishment.

Ground water Ground water is considered a very important water source in the West Bank and especially in those areas that don't receive enough rainfall like the Jordan Valley. About 26% of the rainfall goes into the ground each year, about 724 mcm, which is considered a huge amount. If the farmers could use all of that amount, it would be of great help to agriculture on the West Bank. Table 25 shows the distribution of the ground water in the West Bank according to the area and amount given.

Rainfall goes into the rocks of the various aquiferous units and spreads as underground flow in all the directions of the West Bank (see Figure 11). The West Bank hilly backbone has tent or arch shaped rock

TABLE 25. Underground water resources in the West Bank (1978)⁷

	no.	amount	%	no.	amount	%	no.	amount	%
Springs	24	49	41	32	35	29	56	84	70
Wells	120	12	13	195	20	17	215	32	30
Total	-	61	54	-	55	46	-	116	100

upfolds, which helps the ground water to spread in various directions with different capacities. It could be distributed to three different areas: West towards the coastal plain, east towards the Jordan Valley, and northeast towards Marj Ebin Amer and Beisan (see Figure 11). Accordingly, into the system of aquifers related to West Bank can be divided into several basins¹⁸:

1. West: Although its natural discharge is via two separate spring systems and although some faults cut across it from West to east, the whole West drainage basin is considered as one unit (number 1 in Figure 11). It discharges into the coastal plain.
2. Northeast: This drainage basin is subdivided into two overlying aquifers, both discharging into the Jordan Valley at the end. One Basin (number 2 in Figure 11) drains the Ajlun series (Judea group in Figure 11), while and the Nablus-Jeneen basin (number 3 in Figure 7) drains the Jeneen subseries of the Belga series (Audut group in Figure 11) aquifer.
3. East: The eastern basin drain into the Jordan Valley They include five almost separate catchment areas: Buqueila-Wadi Malih (number 4 in Figure 11), Far'ah (number 5), Ou'ja Fasayel (number 6), Rammallah-Jerusalem (number 7) and the West Bank desert (number 8).

The use of the ground water in the West Bank is divided into two systems: springs, and wells. These sources are most important in the Jordan Valley area because of the low rainfall.

Natural outlets and springs The majority of the flow outlets of the West Bank aquifers are the springs, which are found at the foot of the hilly region starting from the eastern slopes all along the Jordan Valley and along the coastal plain of the West Bank in the West.

All of these springs flowing out from the eastern slopes are located in the Jordan Valley area. These springs are used for agriculture mainly, irrigating about 40 thousand dunums in the Jordan Valley.

Another 30% of the total water consumption in the West Bank flows out from the Western slopes, consisting of about 10.8 mcm.

Of about 300 springs in the West Bank, most of them are very small and seasonal and have no agricultural value. The springs mainly depend on the varying annual rainfall, so their productivity varies. Moreover, no interest has been shown in improving the situation of these springs (e.g. by collecting the water in lakes, widening their margin, building channels etc.). So their productivity is decreasing, and they will not become a major water source unless they are developed.

Wells The wells in the West Bank produce about 30% of the total water consumption 10% from the eastern slopes, and 20% from the Western slopes. Well water is used both for domestic consumption and for agriculture. There are two types of wells in the West Bank right now, the Palestinian farmers' wells and the Israeli settlers' wells.

Palestinian farmers wells Until the June 1967 war, there were about 730 wells in the West Bank. About 314 of them are working now, while the others are dry or closed by the military authorities of wells as in El

A'almay Agricultural Training Center in Jericho, the confiscation of the land where the wells are located, or for other technical reasons. The Arab farmers' wells are distributed in two major areas in the West Bank. The coastal basin area, which includes Jeneen, Tolkaram, and Qalkilia, contains 185 wells that provide 53.2% of the total production. The second major area is the Jordan Valley, which includes 96 wells with 26.2% of the total production. Another small area is the mountains in the center and south of the West Bank, which includes 10 wells with only 13.3% of the total production. Table 26 shows the distribution of the Arab wells.

TABLE 26. Distribution of the Arab Farmers Wells and Their Productivity in the West Bank⁸ (1977/78)

Area	# of working wells	Pumped water (1000m ³)	% of the total
1) Jordan Valley	96	9932.7	26.2
-Jericho	40	3464.5	9.1
-Fasayel, El Ou'ja	11	1077.8	2.8
-El-Jeftlik	29	2656.1	7
-Marj Na'ja	8	879.5	2.4
-Bardallah	8	1854.8	4.9
2) El Far'ah Valley	23	2767.3	7.3
3) Western Slopes	185	20204.8	53.2
-Jeneen, Araba			
Qabatia	56	3277.8	8.6
-Tolkaram	59	10128.8	26.7
-Qalkilia	70	6978.2	17.9
4) Southern heights	10	5033.6	13.3
-Rammallah	2	891.6	2.4
-Bethlehem	2	3653	9.6
-Hebron	6	489	1.3
Total	314	37938.4	100.0

The Israeli settlers wells In 1968 Mekorat, the Israeli water company started drilling wells for the Israeli settlements with the permission of the military authorities in the occupied territories. Dr. Quiringi's article on water and water rights in Middle East International (October 1978) is consistent with the information quoted in the Hebrew press. He reports that

"Since 1968 Mekorat has drilled at least seventeen new wells inside the West Bank to provide for the domestic consumption and irrigation requirements of the new Jewish settlements, in addition to using four pre 1967 wells owned by absentee owners, which are also used to provide irrigation exclusively for lands now cultivated by the new Israeli Settlements. On the other hand, Dr. Quiring confirms that "since the beginning of the Israeli occupation of the West Bank, no Palestinian Arab village or individual has received permission to drill a new irrigation well in the West Bank, and only seven permits have been issued since 1967 to drill wells to supply domestic water consumption"⁹.

The Israeli settlers wells produce about 14 mcm according to 1977/78 statistical report, which is equal to about 37% of the Arab farmers' 314 working wells in the West Bank (see Table 27).

These data from the Israeli Statistics have been proven inaccurate by Palestinian researchers in the West Bank. It has also been found that these data from Israeli statistics contain inaccuracies. One researcher on water policies in the West Bank found in his study about this table layout of the Israeli settlers wells, that, "The real number of the Israeli wells which are in the West Bank are more than what was given in Table 27". Two new wells in the Jordan Valley, one in El-Ou'ja area and the other in Bardallah, there are some Israeli wells in the mountainous areas. We believe that the total of Israeli wells is 27,

TABLE 27. Distribution and productivity of the Israeli Farmers wells in the West Bank 1979⁷

Name of the well	Amount of produced water (1000 cm)
Jeneen	273.1
Marj Na'ja (14)	246.7
Marj Na'ja (29)	310.0
Far'ah (5)	1.1
Ariaeh (1)	162.6
Messwah (1)	1179.8
Fasayel (2)	1146.4
Fasayel (3)	1154.9
Fasayel (4)	852.4
Jericho (1)	1226.8
El-Ou'ja (1)	277.3
El-Ou'ja (2)	830.7
Atarah (1)	1705.5
Beqa'ah (1)	734.5
Bardallah (1)	3901.0
Bardallah (2)	26.2
Jeteet (3)	117.6
Total	14144.8

the total amount of the water by the Israeli authorities from these wells, is more than 14 mcm and perhaps it equals 50% of the total amount of water pumped from the Arab farmers wells⁷.

Water consumption The water consumption distributed into three major purposes: agriculture, housing, and industry. Agriculture is the biggest consumer of water in the West Bank. The total water consumption in the West Bank varies annually according to the total production of the wells and springs, which is related to the yearly rainfall. While

the water consumption for the agricultural sector of the West Bank is about 100 mcm as an annual average, which means that each individual Arab consume 142 cm per year, it is about 537 cm per year per individual for the Israeli settlers in Palestine. Consumption per housing unit shows an even greater disparity while it is 13 cm per year per individual in the West Bank, it is 86 cm per year per individual for the Israeli settlers. The housing consumption in the West Bank includes the industrial sector consumption, but the Israeli industrial sector consumption alone is about 96 mcm, which is nearly equals the total housing consumption in the West Bank. Table 28 shows the estimation for the water consumption in the West Bank and Israel.

TABLE 28. Distribution of water consumption in the West Bank and Israel (1980 in million m³)⁷

	West Bank	Israel
Agriculture	90	1377
Industry (for West Bank with homes)	-	96
Home use	10	367
Total	100	1780
Consumption rate per individual	142	537
Consumption home per individual	13	86

Table 28 shows that Israel consumes 90% of the total consumption in the West Bank. The irrigated area is a very small. We can see that from the total area of the West Bank, which is about 5,755,000 dunums. Only 28% or 1,615,800 dunums is cultivated and of that 87,000 dunums or 5.4% of the total cultivated land are under irrigation. The total irrigated area is distributed over the different kinds of agricultural production like vegetables, fruits, citrus, and field crops. Table 29 shows the distribution of the irrigated area for different crops and different districts of the West Bank.

TABLE 29. Irrigated land (1977/78) in the West Bank¹³ (dunums)

Districts	Vegetable	citrus	fruits crops	field	total
Jeneen	6400	2500	-	-	8900
Tolkaram	13000	17100	600	900	31600
Nablus	1300	1600	-	-	2900
Jordan Valley	23500	4400	2100	8500	38500
Rammallah	463	120	600	-	583
Bethlehem	1037	80	600	-	1117
Hebron	700	100	1700	-	2500
Total	46400	25900	4900	9400	87400

Table 29 shows that the vegetable area holds more than 50% of the total irrigated land in the West Bank, and about 43% of this land is located in the Jordan Valley area. The coastal basin area which

includes, Jeneen, and Tolkaram, includes 40,500 dunums, which equals about 48% of the total irrigated area. The second major irrigated crop in the West Bank is the citrus which is about 25,900 dunums of the total irrigated land.

Irrigated cultivation is considered very important because it has a large capacity for improvement, and especially with the new technological methods used. But irrigation depends mainly on the water sources, which have a lot of problems, as we are going to see.

Problems that face water sources There are many problems and constraints that face the water sources sector in the West Bank, and according to many observations, the Israeli military authorities' policies are the most important factor. The Arabs believe that the main objective of the Zionist Movement, not only in Palestine but also in the Middle East, is to control the natural resources of the area. In order to survive in this underdeveloped region where agriculture is the main economic sector, they must control the land and water sources. During the British Colonial period, the Zionist Movement used its military power (supported by the imperialist power of Britain) to control these natural resources. At the end of the last century, into the middle of this century, the USA did the same thing which is continuing up to now. We can see that policy very clearly in Amon Magen article in the Hebrew press, "One Source of Water to the Sharon and Shamron":

"Water as a source of conflict among neighbors is not a rare phenomenon in history, either in our region or in the wider world. The middle east whose waters are in short supply

and whose climate is relatively hot, has known, and still knows numerous such conflicts. The "state of Israel" has also managed in its short life to engage in confrontation with two of its neighbors, Syria and Jordan, and even mobilize aircraft and raiding forces against them on the question of exploitation of the water of the Jordan and the Yarmuk rivers. Meanwhile there is developing another conflict between the Israeli and Arabs living at its borders. Coincidentally, all these conflicts center on more or less the same quantity of water, 500 mcm annually. This is approximately the flow of the Jordan river, which is approximately the flow in the Yarmuk river, and approximately the quantity of water pumped in Israel whose origin is the rainfall over the slopes of "Judea and Somaria" (West Bank)"⁹.

We can evaluate the water problem according to the different kinds of the water sources.

Rainfall problems

1. The rainfall in the West Bank is limited to a short period in the year, as West Bank receives rainfall in winter only.
2. The annual total amount of rainfall is different from one season to another and from one month to another in the same season which does not give the cultivation the needed water at the suitable time.
3. The West Bank rainfall is mostly very heavy and strong, and do not last for a long time, which leads to some problems of soil erosion and of crops being swept away. This rainfall also runs off quickly through the valleys without being used.

Spring problems

1. The production of the springs depends totally on the amount of rainfall per year, and as we saw before, the total rainfall in the West Bank is various from one season to another, thus affecting springs' productivity.

2. Drilling of the wells affects the water production of the springs. The fresh water in the upper strata of the aquifer is reduced as a result of unplanned drilling, such as in the case of the Israeli Settlers wells. So the spring waters become increasingly saline.

"On the West Bank, it is well-known that the Israeli military occupation in El Ou'ja, near Jericho, has drilled a number of Israeli wells in close proximity to local Arab springs, contrary to Jordanian laws regulating the drilling of new wells. These include the two wells drilled in the Jericho area above Ain Sultan spring, three wells drilled on the site of Al-Ou'ja spring, two wells drilled on the site of Fasayel spring, five wells drilled in the Wadi Farm basin, and two wells drilled in the Bardallah basin. The outflow of the Al-Ou'ja spring, which was on the average 11 mcm per year, dried up in the summer of 1979. Informed hydrologists link this water depletion of Al-Ou'ja to the three Israeli wells dug on the site of this spring"¹⁵.

As a result, the Palestinian farmers in that area of the Jordan Valley lost their agricultural production for that year, and had to cut many citrus trees and get rid of such cultivated land, which would be confiscated by the Israeli military occupation. On the other hand, it affected the living standard of the Arab people in that area.

"All the cultivation in the village was ruined by the lack of water, an estimated loss of \$3 million. Farmers of Al-Ou'ja have asked the military government to stop pumping from their wells, or to supply them with water from the Israeli wells on their land, or to allow them to drill a new village well to complement the water supply of the spring. The Israelis have categorically rejected these requests, and have done nothing to alleviate the critical water shortage in the village"¹⁵.

3. There is no continuous official interest in the West Bank springs in improving their productivity or in helping the farmers to receive the water as efficiently as possible.

Wells problems The major water related problems in the West Bank concern Arab farmers and village wells. As we saw before the total number of the West Bank wells decreased from about 730 to 314 between the period of 1967-1978, and the production of the official 17 Israeli settlers' wells in the West Bank equals about 40% of the total production of the 314 Arab farmers' wells. The major wells problems are as follows:

1. The Israeli military authorities have restricted the amount of the water that the Palestinian farmers can pump from their own pre 1967 existing wells. If the Palestinian farmers pump more than they are allowed, they would face a trial and fines. The closure of the cultivated area beside the Jordan river resulted in the closing of some of the Arab farmers wells.
2. Confiscation of the Arab farmers wells. The farmers lose their ownership of these wells, as what happened in Marj Na'ja and Zbydat (part of the study area), where the farmers lost their wells to Argaman settlement, or in Bardallah and Ain al-Baida. "More importantly, however, the villagers would have lost ownership and control of their water by the increase in settlements which heighten the competition between the Settlers and the Arab villages. Under the present agreement, the Israeli military governor of Jericho is responsible for settling such potential conflicts, but the villagers have little reason to assume that he will adjudicate such disputes in their favor"¹⁹.

3. Drilling the Israeli settlements' wells affects not only the springs, but also the Arab farmers' wells, as we saw before in the drilling area 12 wells owned by Palestinian farmers dried up as a result of drilling of Israeli settlement wells. "As of today, the Israelis have drilled at least 20 deep bore holes, (from 300-600 meters deep), which they call Jewish wells in the Jordan Valley, and are pumping 15-17 mcm of water per year for the exclusive irrigation of the land seized for the Israeli colonies"¹⁵.
4. The Arab farmers in the West Bank could supply their land by drilling new wells when they face all of the above problems, but getting the permission to drill a new well is very difficult and remains a major issue of contention between the Palestinian farmers and military government. Amon Magen writes: "After the 6 day war of 1967, the military occupation took care to apply on the West Bank the laws regulating water drilling that are in force in Israel. Permits to sink wells were given on very rare occasions, and especially only to provide for supplies of drinking water for domestic use. This is done in order to not affect the pumping in Israel"⁹ (one source of water for the Sharon and Shamron).
5. The low productivity of the Arab farmers' wells is also another important problem, which is a result of using old machines for pumping and the cost of producing the water by these machines,

which increases the total cost of agricultural production. Another more important reason for the low productivity is related to the depth in these wells and the aquifier system.

"The Arab farmers' wells pump from an aquifier that is at the maximum 100 meters deep, which is called Pleistocene. The problem here is that such wells that pump from these aquifiers is quickly affected when the water level decreases suddenly as a result of the drop in rainfall. But the Israeli settlers' wells are very deep (more than 400 meters), and which reach the Senomanian aquifier, and because the aquifiers on the different depths are connected together through the faults, which characterized the geological formation of the area, the Israeli settlers' wells will not dry up until after all the Arab farmers' wells are completely dry"⁷.

Thus the water related problems in the West Bank and Gaza Strip and all of the country are directly related to the existing of the military occupation of Palestine. The inability to control the natural resources become a life or death matter for the Palestinians in their daily lives. The Palestinians are always threatened by confiscation of their land, houses, and water sources.

Agricultural Production

As we saw before (under the geographical background, water sources and land use sections) the different climates are associated with different kinds and quantities of crops. Irrigation plays a major role in determining the productivity and the kind, of crops which can be grown. Using the different types of new technologies also affects agricultural production.

Production Fruits, vegetables, field crops, and citrus are the main agricultural crops in the West Bank. These major crops are distributed all over the eight districts of the West Bank according to the different agricultural regions and districts (see Figure 7).

Fruits Fruits are planted mainly in the mountainous area of the West Bank, the heights regions. The total area cultivated by fruits in the West Bank area is about 940 thousand dunums which is about 65% of the total cultivated area. About 73% of the total fruit area in the West Bank is olive trees, then grapes, mainly in the south of the West Bank (Hebron district mainly), 9% of the total fruit area is grapes. About 99.5% of the total land cultivated is non irrigated and depends on rainfall as the major source of water. The fruit production in the West Bank depend totally on rainfall and any decrease in the rainfall average will affect not only the fruit production but also the total agricultural production in the West Bank.

Vegetables Vegetables are a very important crop, because they are planted twice a year, and take up most of the irrigated land in the West Bank. Summer vegetables are planted in the coastal and high regions, and depend mostly on rainfall while winter vegetables are planted in the Jordan Valley and the semi-coastal regions and depend on irrigation. Tomato, water melon, and eggplant are the most important winter vegetables. Tomato and squash are the main summer vegetables. The total area planted by vegetables in the West Bank is about 100 thousand dunums 23% in the Jordan Valley and 36% in the coastal and semi coastal regions.

The possibility of increasing the irrigated area of vegetables is very low with the absence of ground water due to the aforementioned military occupation policies. The productivity of the vegetable crops is very high due to the use of the advanced technology in planting like drip irrigation plastic, green house, and others which we will see later.

Citrus The most important input for citrus plantation is water, and as a result of the lack in the water sources in the West Bank, the cultivated area of the crop is not very large. Citrus is planted over about 26 thousand dunums in the West Bank, 76% of this land is located in the coastal and semi coastal area which receives about 500-700mm rainfall and has ground water sources. The increase in this cultivated land depends on the availability of water sources in the area.

The productivity of the different citrus crops is good, averaging about 3 tons/dunum. Using more advanced technology and providing more water sources and other inputs, would increase the total production of citrus and the productivity/dunum. There is good possibility of increasing the total area planted by citrus in the West Bank, especially in the Jordan Valley and the semi coastal regions. But the problems are lack of water, confiscation of cultivated land, and lack of marketing and financial support (citrus trees needs several years before they start production, so they require long term investment).

Field crops The field crops cultivated area has been greatly affected during the military occupation period, as thousands of dunums were confiscated by the military occupation authorities. Prior to 1967, the

total cultivated land of field crops was about 1 million dunums, but then decreased to 530 thousand dunums in 1978, a 47% decrease. 98% of the field crops total area depend on rainfall.

The total production of the field crops is different from year to year, and depends specifically on the annual rainfall. But also on the total area planted and methods used in cultivation. Table 30 shows the amount of agricultural production for different periods.

TABLE 30. Distribution of Agricultural Production in the West Bank¹³

(tons)					
Type	67/68	69/70	76/77	77/78	78/79
Fruits	76000	60800	95900	184400	108100
Vegetables	96000	99700	157300	168100	148900
Tomato	NA	4600	43200	46900	35600
Citrus	30000	35200	85500	80800	79100
Field crops	23500	29400	38400	41100	35900
Total	225500	225100	377100	470400	372000

Marketing

The importance of agricultural marketing has increased during the last 5-10 years, as agricultural production, especially vegetables, in the Jordan Valley (Ghor) and the Semi-coastal area expanded. As a result of this expansion, it became important to export the surplus of this production to the foreign market (Jordan, Israel, and others). The increase in the agricultural production and the flow of large quantities of

this production from the farms to the markets put pressure on the limited marketing facilities in the West Bank, so the farmers started to look for other foreign markets.

Two types of markets in the West Bank are local and foreign.

Local markets

These include all of the markets, wholesale, central, secondary, etc., that exist in the West Bank and Gaza Strip areas. Sales to wholesalers via the commissioner is the most common market. Sometimes the commissioner is himself the landlord. The farmer sends his crop to the wholesale market which is closest to him, and the crop is sold by auction. The commissioner is important whether or not he is the landlord.

Foreign Markets

One of the most important problems which faces the West Bank and Gaza Strip economy is in the area of foreign trade. The economic progress of any country is determined mainly by the study of international trade. "Although the debate on the advantages and disadvantages of free trade between developed countries with equal status may continue through this decade, and we cannot yet say whether the proponents of free trade or protectionism will win the argument, it is nevertheless clear that the results of trade between unequal partners have not been promising. Accumulated evidence shows that the effect of foreign trade between unequal partners (as is the case between occupied territories and Israel) on the economic growth and development of the weaker partner is discouraging"²⁵.

In order to understand the dynamics of the foreign trade on the West Bank, we have to discuss exports, imports and the impact of the balance of foreign trade. In order to determine the impact of the Israeli military occupation on the economy of West Bank, particularly in the agricultural sector, I shall use the data obtained from the Israeli statistical abstracts which reflects the occupation point of view only.

Exports Jordan and Israel are the two major importers of the West Bank products. Agricultural and industrial products are considered the main exports to outside the West Bank. The net value of foreign trade for the West Bank varies from one year to another and also depends upon the different countries which import from the West Bank. Table 31 shows that the total exports of the West Bank by years and different countries.

The most important conclusions in this table are:

1. Agriculture exports are considered the second major product.
2. Israeli markets are the main outlet for the West Bank products, and that is due to the restrictions to other countries.
3. There is an increase in the percentage share of the agricultural products exports during the years 71-82 (1918-2616) and with different rates due to the agricultural production in each year and the export permissions issued by the occupation authorities.

The exports to Israel shows big increase, especially in the industrial part, the fact that building the Israeli settlements in the West Bank requires raw materials and mainly stores, which are available in the West Bank heights, another fact that the military occupation consider east

TABLE 31. Distribution of West Bank Export¹³

	(71-79) million IL, (80-82) Million IS								
Items	1971	1975	1976	1977	1978	1979	1980	1981	1982
	(3)	(2)	(1)	(1)	(4)	(4)	(5)	(5)	(5)
Total exports	148	691	986	1251	2436	3726	981	2394	5066
To Israel	78	442	617	777	1327	291	567	1497	2726
Agr. products	12	66	108	167	292	468	139	258	426
Industrial products	66	376	509	611	1035	1823	429	1239	2300
To Jordan	68	221	343	463	1085	1410	406	881	2320
Agr. products	17	71	98	224	443	524	443	524	108
Industrial Products	51	150	245	239	643	886	298	599	1543
Other countries	2	28	27	11	23	25	8	17	21
Agr. products	-	19	19	-	-	-	-	-	-
Industrial Products	2	9	8	11	23	25	8	17	21
Export total	137	922	984	1559	1970	5748	1114	2586	5478
% share of exports									
to Israel	53	64	63	62	54	61	-	-	-
Agr. products total	20	23	23	31	30	27	-	-	-

Jerusalem (Palestinian population area) part of the Israel which receives a lot of products from the West Bank.

Jordan is the second largest importer country of West Bank agricultural produce. Since Jordan is the closest Arab country to the West Bank, and ruled the West Bank up to 1967, it is no wonder that it is a major trading partner of the West Bank. However, to export to Jordan one must obtain permission for each load from the Israeli military authorities,

as well as paying a high tariff. Getting permission is not easy, and it depends upon several factors like the political situation prevailing at that time in each particular district of the West Bank area.

TABLE 32. West Bank Export to Jordan By Main Items²⁰ (by thousand I.SH)

Products	1978		1979		1980	
	I. SH	%	I. SH	%	I.SH	%
Gross total	166034	100	718511	100	508300	100
Ag. exports products	118941	71.5	140371	64.1	333464	65.6
Tomato	3199	1.9	4438	2	5577	1.1
Cucumbers	5854	3.5	3029	1.4	4060	0.8
Onion	797	0.5	426	0.2	-	-
Banana	1524	0.9	3689	1.6	6144	1.2
Citrus	77947	47	104220	47.6	190732	37.6
	882	0.5	1502	0.7	480	0.1
Grapes	4063	2.4	4613	2.1	8252	1.6
Olive oil	20981	12.6	14568	6.7	108471	21.4
Cheese	3692	2.2	3881	1.8	9745	1.9
Ind. exports products	30109	18	56328	25.7	110599	21.8
Samna	17187	10.4	37583	17.2	68841	13.5
Soap	6791	4.1	10841	5	22467	4.4
Stores	4506	2.5	6654	3	17649	3.5
plastics	1625	1	1249	.5	1640	.3
Others	16982	10.5	21810	10.2	60765	12.6

Table 32 shows the major export products to Jordan for the years 1978-1980, while Table 32 shows the value of these exports in both I.S and J.D.

Imports The West Bank as an occupied area with limited resources and differing problems is a net importer. Total imports have increased yearly during the occupation. Imports from Israel took the lion's share of all imports including those from other Arab countries.

The most important conclusions which can be drawn from Table 33 are:

1. Imports from Israel to the West Bank rank number one for both agricultural and industrial products.
2. Imports from Jordan are in second place after Israel, and from a much lower percentage than imports from Israel.
3. Industrial products are the major imported items from all sources.

On the West Bank imports exceed exports with the trade with all of Israel, Jordan and others. This excess varied from one year to another and according to the size of trade with each country. Table 33 shows the total imports for the West Bank and their distribution by origin from 1971-1982.

TABLE 33. West Bank Imports Origin¹³

Items	Million IL (71-79), Million IS (80-82)							
	1971	1974	1976	1978	1979	1980	1981	1982
Total imports	285	882	1971	4406	8975	2096	4981	10545
From Israel	327	790	1767	3813	7771	1819	4409	9254
Ag. products	40	126	291	638	1179	299	656	1117
Industrial	188	664	1476	3175	6592	1521	3753	8143
From Jordan	14	20	30	87	127	28	85	234
Ag. Products	5	2	2	6	10	3	2	11
Industrial	9	18	28	82	117	25	82	213
Other Countries	44	72	174	506	1076	248	459	1067
Ag. products	757	14	71	24	91	17	31	134
Industrial	36	57	103	481	986	232	455	933
% share of Israel/total	80	90	90	87	87	-	-	-

APPENDIX B: JORDAN VALLEY AGRICULTURE

Soil

The soil in the Jordan Valley area (West Bank) generally contain a lot of salt. The soil is classified to five major parts according to its depth degree of slope, salt, acidity (ph) and clay¹.

First degree (sandy lands)

It is the best land in El-Ghor with a depth of 36-42 inches or 91.5 - 107 cm. Percentage of salt is 2% and the rate of alkali in the land is about 9ph. This lands vector layer is at a depth of 152 cm. This soil is found in three major areas, Jericho (8000 dunums), El- Ouja (4000 dunums), and El-Jeftlik (9000 dunums).

Second degree (sandy loam)

It is the second best quality soil for agriculture. Its depth is up to 61 cm. The rocky layer is at 91.5 cm deep. The rate of alkali in this soil is various between 9.2 - 9.4 Ph, 5% salt. It is about 12,000 dunums distributed all over the El-Ghor area.

Third degree (loamy sand to permeable clay)

This soil is found in two areas Fasayel and El-Ouja with about 4000 dunums. The depth of the sand in this soil is about 45.7 cm, the rocky layer is located at 61 cm depth depending on the location and slope. The percentage of alkali varies between 9.4-9.6 ph.

Fourth degree (Fire sand to slowly permeable clay)

Most of El-Ghor land has this type of soil, about 160,000 dunums. The depth of sand is 46 cm and the depth of the rock is 61 cm. The percentage of alkali is between 9.4-9.6 ph, 5% salt and 12% slope.

The fifth degree

This land is the rest of El-Ghor land about 220,000 dunums. This land does not have the minimum characteristics needed for agricultural use. This is waste land and located as rocks, sand dunes, and marshes scattered about in the El-Ghor area.

Land Use

There are about 200 thousand dunums in this area considered as agricultural land. In 1976, the total of the land used by the Palestinian farmers was about 45 thousand dunums as irrigated land and 13 thousand dunums as dry land. There are about 42 thousand dunums of potential agricultural land that is not used, this area beside the Jordan River is closed to Arab and civilian and reserved for military purposes. According to Davar newspaper (11/21/83) several Israeli Settlements in El-Ghor area had finished the work to prepare about 7000 dunums in the Jordan Valley for agricultural uses. This new land joins the settlements area of 3000 dunums already used for planting wheat in the area near the River (El Zour) formerly clearly of Israeli settlers and reserved for military purposes.

Population and Work Force

El-Ghor area is below sea level with a dry and hot climate, which is considered an unpleasant area. The population density is low. The area has agricultural production potential and is of economic importance. Land and water resources combined with warm winter has made the area attractive for few people. The population density in El-Ghor is seasonal, high in the winter and low in summer. Very high temperature and very dry weather in summer force most people to leave. In winter the warm weather brings the people from the mountain areas to El-Ghor. Many Palestinians were forced to leave their land and houses in the highlands in 1948, and came to El-Ghor to work in the agricultural sector. During the 1967 war many of these highland refugee Palestinians again left their homes and moved across the river to Jordan. The Jericho camps, Ain Elsultan camp and Aqraba Eljaber camps are now nearly empty from 50,000 people in Aqraba Eljaber before 1967 only 2.5 thousand. From 12,000 in Ain Elsultan before 1967, now 500 people now remain. This migration reduced the population in El-Ghor, and reduced the work force available for seasonal work in vegetable fields.

Generally speaking, the population in El-Ghor had decreased since the 1967 war, about 60-70 thousand, from 90 thousand had left the area during and after the war. At the same time, Israeli built new settlements and brought new Jewish population to El-Ghor as the Palestinian population was decreased. The Jewish population increased from, 1180 in 1975 to 4000 in 1978 and is projected to be about 8000 by 1995. See Figure 12 for the distribution of the Arab village and Israeli settlements.

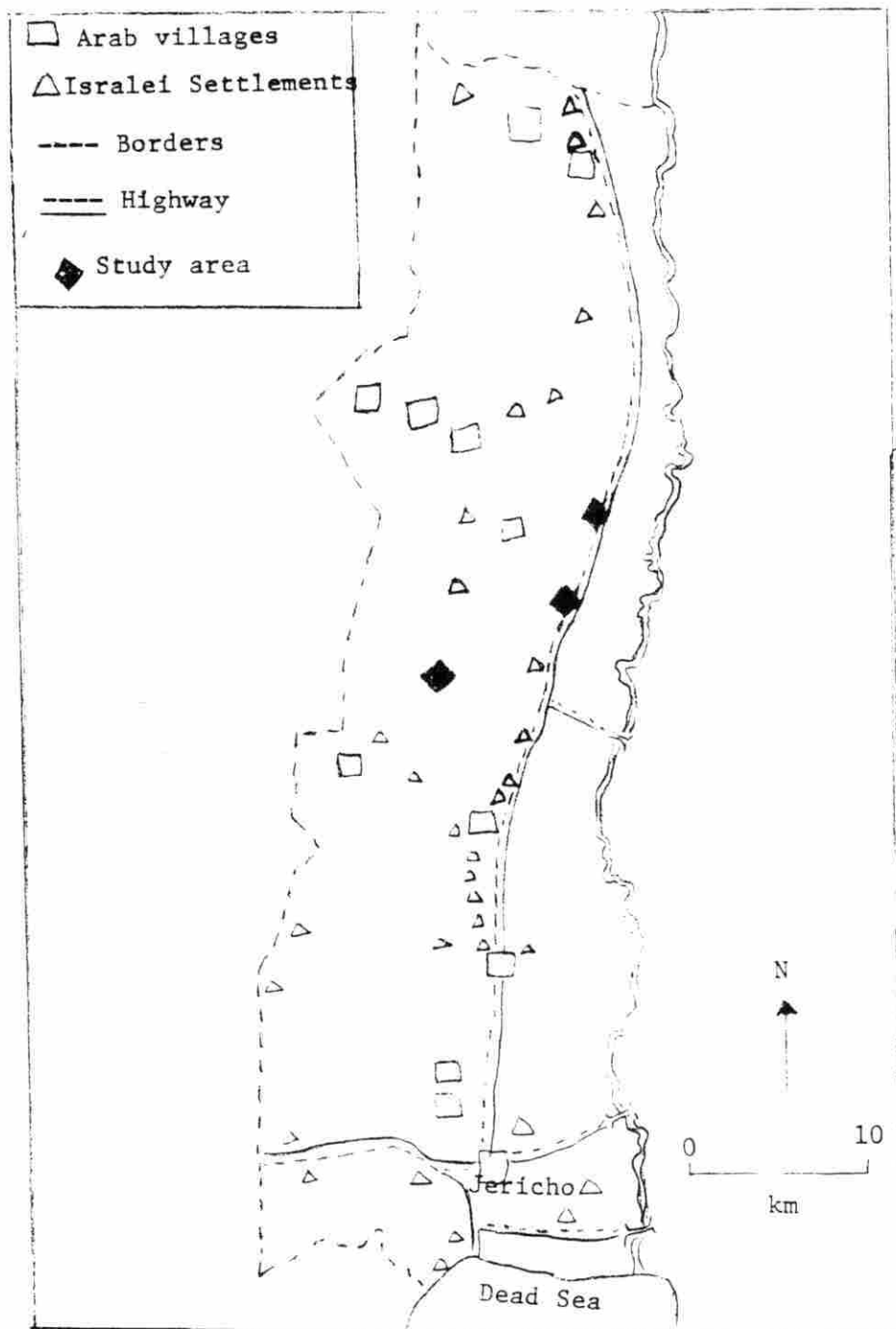


FIGURE 12. The Arab Villages and Israeli Settlements (Abu Arafa, 1, p. 56)

Work force

More than 60% of the total population is not included in the labor force. The rate of labor force participation in these villages is low. Furthermore, many people in the labor force do not have a job, there are unemployed people as well as underemployed.

TABLE 34. Age by village (1983)^a

Age	Bar dala	Ein al Bida	Marj Na'ja	Zeb dyat	Jef tlik	Frush bet Dajan	Ein shi bli	Row total
15-24	148	148	65	91	503	107	34	1097
25-34	46	88	28	47	233	59	9	510
35-44	52	58	16	33	168	39	9	380
45-54	51	35	12	22	142	34	10	308
55-64	23	27	10	16	78	26	7	188
65 +	27	31	7	17	76	17	6	184
Total	347	387	138	226	1200	282	75	2655

^a Arab Thought Forum.

The labor force is those individuals 14 and older. However, about 148 or 5.5% of the total population 14 years and older are seventy years old and over. The total labor force in seven villages is about 2519 or about 30% of the population. Each potential worker supports 3 and 1/3 others.

Seventy four percent of the total employed person work in agriculture. The rest commerce, industry, government and social services (See Table 35). About 71% of the employed workers are family workers, self employed, and

students. The annual wages for the workers is very low. Many are part time only in various seasons harvesting crops, unpaid family worker, self employed labor in a village or Israeli settlement. Students work as laborers on vacation and help on their family farm at seasonal jobs.

TABLE 35. Work sector by village^a

Work sector	Bar dala	Ein al Bida	Marj Na'ja	Zeb-dyat	Jif-tlik	Frush bet Dajan	Ein-Shibli
Agriculture	244	311	91	174	896	210	11
Commerce	3	5	1	2	14	5	1
Industry	1	0	0	0	5	2	0
Government	3	1	3	0	4	0	0
Social Services	4	2	5	2	8	1	0
Other	1	2	1	2	10	0	0
Not Ascertained	89	66	37	46	263	64	0
Column Total	347	387	138	226	1200	282	12

^aArab Thought Forum.

Land Holdings Distribution

The land holdings in the Jordan Valley are concentrated in a few hands similar to the West Bank (Chapter 2). The landlords generally inherited the land from their fathers. A major change in this distribution resulted from the occupation. The military occupation emptied some land of its

native owners, and resident Palestinians. During the first year of occupation (1967), the Israeli military confiscated Arab farm land and built settlements on this land. Both the big and small landlords lost land (see Figure 13).

Big landlords control most of the Jordan Valley agricultural land. About Sixty-two percent of the farmers are sharecroppers, and cultivate on land belonging to landlords who own large sizes of land.

The smallholders are farmers who own land, they are 16% of the total agrarian class in the seven villages, this rate represents the same distribution as for entire Jordan Valley. The landlords resident in these villages are not more than 4%. Most of the land is owned by people who live outside these villages, usually in cities such as Nablus, and Jericho.

Sixty-eight percent of the total dunums in these 7 villages are sharecropper land, and 17% is operated by owner resident in these 7 villages. The small holders operate less than 18% of the total land (about 3055 dunums) (see Table 36).

Water Resources in the Jordan Valley

The Jordan Valley, below sea level, is dry area, that receives, very little rainfall per year. However El-Ghor is very rich in ground water. Underground channels carry water from the surrounding heights, and good water flows out of the ground as springs, or can be pumped from wells. The hydrology of West Bank is such that the ground water flow is from the east slope towards the Jordan river. About 26% of the rainfall in the



FIGURE 13. Agricultural land in the West Bank Ghor (Abu Arafa, 1, p. 39)






Highway	—	Israeli Settlements	
Bridge	—	Closed Area	
Israeli Settlements	▲	Israeli settlements land	
		Arab farmers land	
		Uncultivated land	

TABLE 36. Form of land holdings and total dunumage by agrarian class¹

Form of Landholding (total no. of dunums)	Share-cropper	Shepherd	Cash-tenant	Small-holder	Row total
Owned	753	159	198	1912	3022
Cash rented	1226	260	1478	416	3380
Share rented	9899	198	284	727	11108
Column total	11878	617	1960	3055	17510

highlands goes into the ground. The West Bank receives (about 724 mcm) this is a huge amount of water. The production potential is large and good methods are important to use it. To take advantage of the water, people have built bridges, dams, and channels which save and store the water until they need it. The water resource is composed of rainfall plus ground water.

Rainfall

About 40% of the Jordan Valley area receives 100 - 200 mm, another 50% receives 200 - 300 mm. About 10% (50,000 dunums) receives less than 100 mm per year. Rainfall in season reduces irrigation water required. When good winter rainfall occurs there is no need for irrigation for several months. Rainfall also provides pasture for grazing of sheep and goats.

The available water amounts

The water resource in the West Bank Jordan Valley, is the total amount of water available without any of the current restrictions. Probably the total available water is about 250 mcm per year. If all water could be captured the Arab farmers could irrigate 200 thousand dunums (40% of the total Jordan Valley area). However, the real amount of water they use currently is about 45 mcm or 18% of the total available water resources. Some water is not captured and some is not available to Arab farmers. The major ground water resources currently used are springs and wells, even though, only about 50% of the total flow is used.

TABLE 37. The amount of water that could be available in El-Ghor¹

Water resource	Amount mcm	used mcm	% used
Sweet springs	70	33	47
Salty springs	50	-	0
wells	18	11	61
Jordan river	9	-	0
West Ghor Channel	100	-	0
Total	247	44	18

Table 37 shows the available and used water in the West Bank Jordan Valley.

Before going on to the reasons why Arab farmers cannot use all of the available water, let us see the distribution of water use in the West Bank Jordan Valley.

TABLE 38. Used water in the West Bank Jordan Valley in 1980¹

Area	Water resource		Total
	Springs	Wells	
Jericho	18	4	22
El-Oa'ja	10	1	11
El-Jeftlik	2	3.7	5.7
Marj Na'ja	-	1.0	1
Bardalla	3	1.8	4.8
Total	33	12.5	43.5

Table 38 shows the amount of water used in the El-Ghor area in 1980. From this table, we can see that the major resource of water is springs, which give 33 mcm or about 79% of the used water. As we know from Chapter 2, the outflow of the springs depends mainly on the annual rainfall, therefore the various amounts of rainfall each year, effects the total production and the life of the farmers.

Why are Arab farmers in the West Bank Jordan Valley unable to use all of the available water? In order to answer this question, let us look at each resource and see what problems face each one.

Salty springs The salty water springs are not good for agriculture. Using them may have bad effects on plants and would destroy agricultural production. There is no good possibility for purifying this water to make it available for agriculture because it costs too much, and would lead to a higher cost of production. However, this salty water could be used for raising fish and for industry.

The Jordan river The Arab farmers cannot use any water from the Jordan River. In 1965, the Israeli military occupation built a channel to pump Jordan River water from the Tyberia Lake to southern Palestine (Naqab). In 1979, they pumped 305 mcm from Tyberia which had received 296 mcm in that year from the Jordan River. On the other side of the river, the Jordanian government had built an Arab project to transfer about 230 mcm from the estimated 320 mcm from the Jordan River, which Israel was transferring through its project. The Arab farmers on the West Bank Jordan Valley originally used this water resource before 1967, but as a result of the 1967 war the Arab farmers could not use this water for the following reasons:

1. The Israeli military occupation had closed 80,000 dunums of the land located beside the Jordan River with a width of 1-8 km.
2. The Israeli military occupation had destroyed the water pumps from the Jordan River which were owned by the Arab farmers.
3. The military occupation destroyed a channel on the river which had been used to bring the water from the river to the farms.

West Ghor Channels Pre-1967, during the Jordanian Rule of the West Bank, there was a plan to build two channels, one on either side of the Jordan River. As a result of the 1967 occupation of the West Bank, that part of the plan which had been on the West side of the river was stopped. That channel had been estimated to provide the West Bank Jordan Valley by 100mcm water which was supposed to irrigate thousands of dunums.

Sweet springs This water resource supplies about 75% of the total water used in the Jordan Valley. This amount of used water equals about 47% of the total available amount of water in sweet springs in the West Bank Jordan Valley. The remainder of this water goes to Israeli settlements or is unused water due to evaporation (the average of evaporation is 11 mm per day in the Jordan Valley).

After this background about the total availability and use of water in the West Bank Jordan Valley, we shall look at the current situation of ground water by its major sources.

The running water As a result of its geographical location, the West Bank Jordan Valley is considered the receiver of all falling water from the surrounding heights. All of the running water goes into the Jordan River, which is considered the major source of running water in this area. This source water is called wadi in Arabic and the best way to use these wadies is by building big dams and lakes to save and store this water until the time it is needed. However, problems with getting permission to do this and with financing the building are the major restrictions for such projects.

Springs and underground water resources As a result of the location of this area (under the eastern heights), all of the large amount of unused rainfall water from the mountains goes deep into the ground and is stored in underground passages. It comes out of the ground as springs, and runs through the small valleys as wadies until it reaches the Ghor. These wadies are a major water resource for irrigation.

There are about ten major springs which vary in their size and productivity. These springs supply about 40-70 mcm of water which about 40mcm is salty water from the Elfashka spring which goes to the Dead Sea. The Israeli military policy about water does not allow this major water resource to be fully used by the Arab farmers. They have limited Arab use by diverting a large amount of this water to the Israeli settlements in the area, and especially by drilling wells around these springs for the settlements. This has led to the drying of these springs and resulting in a lower level of water.

Again, the major source of this problem is that the Israeli military occupation does not allow the Arab farmers (while it does allow the Israeli settlers) to dig wells. Israeli wells have affected the Arab farmers by giving Israeli settlers a very huge production power which is about eight times deeper in some cases. This shows the difference in productivity for both wells.

From Table 39, we can see that the major springs (according to the annual amount they supply) are El-Duok, El-No'ama, El-Daju, and El-Far'a.

Table 40 shows the distribution of the water supplied from these springs according to their production power and the amount which is used for irrigation.

Only 47% of these springs water production are used for irrigation and other purposes. The rest of this water is lost as evaporation, or runs to the Jordan river and goes under ground. The big farmers and landowners are now making water pools to save and collect this running water to use it

TABLE 39. The major springs in the West Bank Ghor¹

Name	Power mcm	Annual Amount mcm	Salty milly maze	Irrigated area/dunum
El-Qalt	200	4-6	0.32-0.40	3000-4000
El-Duok	400	5-17	0.56-0.49	3000-5000
El-No'ama	200	2-12	0.56-.049	3000-5500
El-Sho'a	-	0.5	-	400
El-Soltan	700	6-8	0.55	3500-7000
El-Oa'ja	1000-2000	7-12	-	3000-6000
Fasayel	40-60	2	-	-
El-Badan	-	-	-	-
El-Far'a	-	-	-	-
El-Shibli	650	16	-	-
Bardalla	-	-	-	-
Ein El Bida	-	-	-	-

TABLE 40. The use of springs in West Bank Ghor¹

Name	Production Power cmm	Used for Irrigation cmm	Percent
Bardallah and Ein El Bida	16	3	18
El-Jeftlik	2	2	100
Fasayel	2	-	0
El-Oa'ja	10	10	100
El-No'ama	12.5		
El-Duok	17		
El-Soltan	5.3		
El-Qalt	5.5	18	45
Total	70.3	33	47

when they need it, but this is still not the most effective way to stop losing a large amount of the springs water.

Wells Wells are considered one of the major water resources in El-Ghor area. After the Israeli occupation of the West Bank and Gaza Strip, it became very difficult to get permission to dig a new well or to maintain old wells in all of the occupied territories. At the same time the military occupation put limits (restrictions) on the amount of water that the farmers could take from their wells. On the other hand, they allowed the settlements to dig very deep wells which affected the rights of the Arab farmers to their resources, on one hand, and effected the level of the water in these wells and springs on the other hand. Three examples of these will be discussed here. The first is El-Alami association in Jericho, which had more than ten wells before 1967 but in the 1967 war the Israeli soldiers destroyed most of them. (This association is located on the West side of the Jordan River in Jericho exactly at the border between Jordan and West Bank). When the people of this association asked to rebuild these wells, they could not get permission for all of the wells, especially those which were near the Jordanian border. Permission was granted to rebuild only four of these wells, and they could only be partially rebuilt. In addition, the military occupation confiscated more than 50% of this associations' agricultural land for military purposes and they built military highways in its agricultural land. A second example happen in El-Oa'ja village (located about 10 km north of Jericho) few years ago when the settlers dug a deep well near the village well. This caused

the village well to become dry and as a result the Arab farmers had to cut their citrus trees and other fruit trees. Many of them left the area, and those who remained became laborers working in the settlements and other places. The third example happened in Bardallah when the Israeli water company drilled a well about 20 meters from the Arab village well which also caused the village well to become dry. This company began distributing the water from their well to the farmers in both this village and another one in that area called Ein-el-Bida. However, their policies for distributing the water are very unequal. They give priority to the Israeli farmers in the surrounding settlements and give the Arab farmers only a few hours per week. The Arab farmers have to arrange their need and use of the water to comply with the company, while the Israeli settlers enjoy it every day for irrigation and swimming.

According to the Israeli statistics, there were about 96 wells in the West Bank El-Ghor area up to 1978; six of these did not work due to certain circumstances. Seventy-seven of these wells gave about 10 million cubic meters of water which was about 19% of the total production from all wells in the West Bank (estimated to about 52 million cubic meters).

Table 41 shows the number of wells in El-Ghor and their production of water. These wells are used to irrigate between 6 to 10 thousand dunums of the agricultural land in the West Bank Ghor area depending on the different kinds of crops which are grown.

TABLE 41. Wells in the West Bank Ghor area 1977-1978¹

Area	No of Registered wells		Output m3/hour	Rate/ well m3/hour	Total annual mm3	annual pump per well mm ³
Jericho	40	31	1350	45	3465	1118
Fasayel						
El-Oa'ja	11	10	618	88	1078	1078
El-Jeftlik	29	22	1339	84	2656	120.7
Marj Na'ja	8	8	685	98	880	112.2
Bardalla	8	6	389	65	1855	309.1
Total	96	77	4381		9933	

The Israeli Settlements in El-Ghor

Since the Israeli occupation of the West Bank and the Gaza Strip, the military occupation have given the settlers in El-Ghor a lot of attention and benefits. They started building two kinds of settlements all over the El-Ghor area -- agricultural in El-Ghor and industrial in the eastern heights which are directly over looking El-Ghor. At the same time, their soldiers were spread all over the border, occupying thousands of dunums for military purposes.

The Dead Sea area

This area extends from Ein-Jedy in the south of the Dead Sea up to Jerusalem. This area includes about 8,000 dunums of the agricultural land in El-Ghor. The military occupation authorities built three settlements in

this area where they planted winter vegetables, dates, palms, and raised some livestock like turkeys. They also used the Dead Sea as a tourist area.

The Valley area

This area extends from Jericho city in the south up to the so-called "Green lines" in the north. It includes about 30 thousand dunums of El-Ghor agricultural land and has 25 settlements all of them agricultural. These settlements are growing many kinds of agricultural crops, due to the richness of water and good soil in this area.

The eastern slopes

This area includes a lot of the land that is on the West Bank side of the Jordan Valley yet is close to the Arab villages in the eastern heights. This area is poor in its agricultural land due to the shortage of water resources. It includes 12 settlements. Part of these settlements depend on agriculture and the others depend on both agriculture and industry. They are growing some vegetables and field crops, and raise turkeys.

Since the Ghor region is very important, the Israeli military occupation is planning to increase both the number of settlements and the density of Jewish population in these settlements.

Table 42 shows the distribution of the Israeli settlements in the Ghor area according to location, establishment date, total confiscated land, and ownership of the confiscated land. (Also see Figure 9, for the geographical distribution of these settlements.)

TABLE 42. The Israeli settlements in El-Ghor up to 1982^{2, 15}

Area	Name of settlements	Year estd.	confiscated land	Type of ownership
1) Dead sea	a) Mitsbea Shaleem	1971	200	Government
	b) Kalia	1968	2000	Government
	c) El-Mouj	1977		
2) Jericho	a) Bed-Harava	1980		
	b) Mol Nevo	1982		
	c) Ferd Yareho	1980		
	d) El-Yeashe	recent		
3) El-No'ama	a) Ne'ma	1982		
4) El-Oa'ja	a) Eitaf	1970	3000	El-Oa'ja
	b) Naren	1977	20000	El-Oa'ja
	c) Zorj'e	1979		El-Oa'ja
5) Fasayel	a) Fasayel	1975	3000	El-Oa'ja
	b) Tomer	1978		
	c) Jeljal	1970	3300	Jericho
	d) Netif Hajdod	1976		El-Oa'ja
6) El-Jeftlik	a) Mosh'a	1970	4600	El-Jeftlik
	b) Shlomo Souon	1977		El-Jeftlik
	c) Yafet	1980	500	Government
7) El-Zbydat	a) Argaman	1968	8600	Zbydat
	b) Mahoula	1968	3800	Bardallah
8) Bardalla	a) Hinadat	1980		Bardallah
	b) Mscaut	new		and
	c) Shedmot Mahoula	1978		Ein El Bida
	d) Rotm	recent		
	e) Melky Sho'a	1976		
9) El-Bequ'a	a) Ro'uy	1977		
	b) Beq'ot	1972	5000	Tamoon
10) Majdal Bany Fadel	a) Jetit	1973	3800	Aqraba
	b) Ma'ala Evrim	1970	3200	Majdal Beny Fadel
11) Bet Oajen	a) Makhora	1973	4800	Betforeek
	b) Hamra	1971	10000	El-Far'a
12) Wady El-Qalt	a) Mitsbea Yareho	1978	50	
	b) Kohaf Hashaher	1977	100	Kofer Malek

Agricultural Production

In spite of all of the restrictions and problems that face the farmers in the Jordan Valley area, it is considered the most important agricultural area in the Jordan Valley. The total agricultural area in the Jordan Valley is about 2.8% of the total West Bank agricultural area, but it produces a substantial amount of the total West Bank agricultural production. This is due to several reasons including that most of the irrigated land is located in this area, that many farmers there use new and developed methods in both irrigation and production, and that this land is able to accept advanced agricultural methods like using machines, due to its nature and due to the use of the protected planning.

TABLE 43. Total cultivated land, production in the West Bank and the Jordan valley Percentage sharings¹

Kinds	Area 1000 dunums		production (tons)			Jordan valley sharings		
	Dry	Irri- gated	Total	Dry	Irri- gated	Total	% of area	% of area
Vegetables	62	46	109	45	114	159	23	58
Citrus	-	25	25	74	74	3	9	
Field crops	554	16	569	91	4	96	13	4
Fruit trees	897	4	901	218	9	227	3	8

Table 43 shows the distribution of cultivated land in the West Bank, its total production, and the percentage rate of El-Ghor sharings.

The natural climate of the area effectes the type of agriculture in the Jordan Valley. As the warm weather in winter gave the possibility of producing winter crops and mainly vegetables, beside the water availability to this area. There are three major kinds of crops in the Jordan Valley. Vegetables (both winter and autumn), citrus, and bananas, and up to now the Arab farmers didn't plant new kinds of crops due to several restrictions, such as degree of risk, water resources, capital, ownership of the land, and the role of the occupation in giving the permissions to increase the total area or plant new kinds of vegetables. Table 44 shows the agricultural production in the West Bank Jordan Valley.

TABLE 44. Agricultural production in the West Bank Jordan Valley²⁰

	Area Dunum	Total production tons
Vegetables	23880	59649
Tomatoes	6677	26708
Field crops	13968	4356
Fruit trees	3464	8295
Citrus	3921	9641
Total	45233	80941

Vegetables

It is one of the most important crops that is planted in the Jordan Valley, because it is planted in two seasons, winter and autumn, and all of the planted area of vegetables, depend on irrigation totally. The winter

vegetables are a very important crop, because it is harvested in the time where the supply of this kind in the markets is very low so it gets, higher prices than the summer Vegetables, which are planted in the mountains.

The total vegetable area in the Jordan Valley is more than 50% of the cultivated area. It is about 22% of the total vegetable area in the West Bank and producing about 37% of the total West Bank vegetable production.

The most important vegetable crop is tomatoes which are planted in two seasons, winter and autumn and therefore receive higher prices in the market.

The agriculture season in the Jordan Valley extends from October until May when the summer vegetable production is being harvested in the mountains. The surplus in vegetable production in May at this time requires other markets than the local ones, so the importance of exporting the surplus production increases. The absence of other markets causes many problems for the Arab farmers as they can not sell their excess production when the West Bank markets are satisfied.

"The tomato production, which is considered the main product in the Jordan Valley, faced a big problem in the season of 1981/82. Farmers were expected to export half of their production to Jordan and the other half would be sold in the West Bank markets. However, in this season the farmers did not receive permission from Jordan to export more than 1.5 ton per dunum, which equaled 25% of their total production per dunum, due to the inability of the Jordan markets to receive more. At the same time the Israeli military occupation refused to give permission to export to the Israeli markets. All of that forced made large amounts of tomatoes to be supplied in the local markets and this decreased the price of tomatoes below the cost of harvesting and transporting. The end result was big losses which made the farmers decide to leave their production in the fields"¹.

On the other hand, vegetable production in the Israeli settlements faced problems also, but the government subsidies covered their losses. "The Israeli settlers in the Jordan Valley had to destroy thousands of tons of the tomato production in that season (1981/82), but the Israeli government subsidized them by twelve million shikel, which is about 120 JD/ton(the price per ton in the best season)"¹.

The high cost of production also takes a big part of the production value, due to the advanced methods used in agriculture and irrigation. All of the Arab farmers purchased their inputs from the Israeli markets indirectly through Arab agents and stores, while the Israeli markets did not receive any of their vegetable production in return.

Citrus

The total planted citrus area is not as much as the vegetables. About 15% of the total area planted citrus in the West Bank is located in the Jordan Valley, especially around Jericho. This area produces 13% of the total West Bank citrus production. All of the citrus planted area is irrigated, but the farmers use the traditional irrigation method which is called "opened channels". This method of irrigation wastes a lot of water which is absorbed into the ground or evaporates. Water is a very important production factor for citrus.

The low level of production per dunum for citrus in the Jordan Valley is due to several factors such as methods of irrigation used and the little interest that is given to this agricultural production by the farmers. Interest in citrus production is low because most of the farmers cannot invest their capital in such long term crops.

Fruit Trees

The Jordan Valley area is not a good producer of fruit trees when compared to its potential ability given its weather and available water. On the other hand, the Israeli settlements are planting a large area to fruit production like grapes, bananas and palm trees.

The most important kind of fruit that is planted in the Jordan Valley is the banana. Bananas are planted on about 93% of the total fruit area. The increase in the rate of salt in the water is considered the biggest constraint on planting more bananas, especially since bananas require about 200cmc per dunum (about three times what is need for vegetables).

Field crops

The total area of field crops in the Jordan Valley is very small and limited, about 2.5% of the total field crop area in the West Bank, but it produces about 4.5% of the total wheat production. This high production rate is a result of using irrigation. There is a very good possibility of using more land for field crops especially for those that are used as food for animals.

APPENDIX C: AGRICULTURAL COOPERATIVES ON THE WEST BANK

The agricultural cooperative movement in Palestine began in the 1920's, during the early years of British rule over Palestine. The British Occupation Authorities announced a law under which establishment of rural cooperatives in the villages and cities. These cooperatives were largely agricultural and were encouraged provided different services, such as production inputs, credit, output marketing and some consumer goods. During the war and Israeli Occupation of 1948-52, the West Bank cooperatives were not able to actively operate. In 1952 cooperatives law number 19 was passed by the Jordan government which applied also to West Bank and provided for establishment of agricultural credit and thrift cooperatives. Cooperatives were rapidly formed in Jordan and on the West Bank. Cooperatives such as consumer, housing, water supply, higher education, transportation, school savings, and womens' handicrafts were established. In 1956, the Jordanian cooperative law number 17 set guidelines for new cooperatives, and two years later a 1958 law formalized regulations for housing cooperatives. The Jordan Cooperative Central Union to give services to local coops was established and registered in 1959. The cooperative training institute was established in 1963, and the Jordan Cooperative financial Auditing agency was established later.

The Goals of the Cooperative Movement

A cooperative is a social association and a collectively owned business wholly a group of people choose to work together voluntarily and equally to improve their economic conditions. Cooperative businesses are owned by members of the association to make profit but also to improve the level of living of members who patronize the coop business.

In underdeveloped countries many cooperatives have been started with the help of Europeans and Americans since the beginning of this century. It was hoped the cooperative could provide a way to decrease the gap between the poor and the rich of underdeveloped countries. Many attempts at collective purchases of inputs and sale of products by sharecroppers via cooperatives in less developed countries have been unsuccessful.

The need for utilizing cooperatives in the West Bank and other parts of the Arab world is large. The most important reasons for establishing cooperatives and trying to make them successful are the following:

1. The sharecroppers and landless laborers are the poorest people. As a group they are in surplus that is are more numerous than opportunities. Most sharecroppers suffer under large loans which they cannot repay to big landowners or merchants. They do not control the scarce water, market and credit. Those who control these resources seek their own

best interests, and maximize their returns to the detriment of the sharecroppers.

2. The agricultural sector is the largest employer in underdeveloped countries including Jordan and West Bank. Most who work the land would leave if they could find other work but since there are not enough jobs they must survive on the land.
3. The percentage rate of the work force who were working in the agricultural sector was very high, about 50-60% of the total work force. Due to labor intensive agricultural methods, the sharecroppers themselves provide an important production factor.
4. Organizing farmers into one cooperative per village was natural. The coops used existing administration and local authorities. However, such cooperatives were also controlled by existing community power actors and served the economic interests of the powerful merchants and landlords, and not the interests of surplus sharecroppers.

The cooperatives most important goals are:

1. Helping the sharecropper to obtain loans for subsistence and production at lower interest rates than those that by landowners and merchants.
2. Increase agricultural production and resource productivity by supplying loans, productive inputs, and marketing services.

3. Improving yields and efficiency by improving methods and materials of agriculture and training farmers through Extension.
4. Providing lower cost and longer term credit to replace old debts to merchants at less favorable terms.
5. Teaching the sharecroppers to participate in a democratic self government system. Cooperative meetings emphasized the equal right of each member to speak. Each member should express an opinion, and have the right to vote. He could elect and be elected. Members were to respect majority decisions and upper class members were supposed to tolerate the opinion of fellow members even sharecroppers of unequal or lower social position.

Cooperative associations sometimes made mistakes and not all these objectives were fully achieved in each association. Many barriers limited cooperatives on the West Bank from reaching their objectives. The social system of the West Bank caused the share croppers to say they agreed with the suggestions of the merchants and vote as the landlord-merchant wanted them to vote. The educational level of the sharecroppers was of course less than the landlords. When sharecroppers did not understand, that made them feel inferior.

Financing the cooperatives Any Cooperative must have a financial budget to survive as an organization and provide services to members. This budget could be from membership fees, government subsidy,

grants or sale of products. The West Bank cooperatives, do not receive subsidies, loans, or gifts from the Israeli military government.

As a result the most important financial sources on the West Bank are the following:

Membership fees Any person who wants to be a member in the coop must pay annual dues and buy shares in the coop. This source varies from one year to another according to the number of members who pay the annual fees or buy shares in any projects of the coop. There are few members in West Bank agricultural coops, and there is a decrease in the number of members during the past years and in the willingness to buy shares in projects. This is a small source of funds.

Loans There are several sources of loans for West Bank agricultural coops. The amount of source is unknown but are very important.

- American Near East Refugee Aid (ANERA)
- Jordan Cooperative Central Union (JCCU)
- Jordan Cooperative Organization (JCO)
- Mennonite Central Committee (MCC)
- Foreign Governments
- PLO-Jordan Committee
- Lutheran World Federation (LWF)

A loan was given in 1974 to the Raboud agricultural credit and thrift cooperative society, by the LWF, to buy a tractor to prepare the land. The coop was able to repay the loan before the due date. The

quick repayment encouraged other International organizations to loan and assist West Bank coops. In 1975, the coop Bank in Jordan loaned 10,000 JD to the Tarquomia olive press cooperative for ten years, the cooperative was able to repay this loan on time. In 1978 the amount of coop loans on the West Bank from JCO increased from 10,000 JD to 62,000 JD. After the Baghdad summit meeting, in 1977, control of Arab loan funds for the West Bank was given to the PLO-Jordanian committee. From these funds of 62% were allocated for housing coops, 14% for other non-agricultural coops., and 2,335,000 JD for the agricultural coops which was about 2.4% of the total funds given to the ag. sector. "The availability of these funds would seem to give the future a bright look for cooperatives. But only one coop a rural electrification cooperative has been granted permission to receive a loan from this source"¹⁴.

The lack of credit and other services to the West Bank cooperatives was shown in the US coop representatives report as follows:

"While in the past, Palestinian cooperatives were able to obtain borrowed capital from Jordan, it has become increasingly difficult, and in some cases, impossible. Lack of credit appears to be a major constraint on the expansion of services by cooperatives in West Bank and Gaza. Cooperative activities depend on internally generated equity and debt capital and, on occasion and with permission of the occupation authorities, on matching funds from private voluntary organizations"²⁶.

Subsidies and gifts Subsidies and gifts to cooperatives are common in LDCs from the national government. But because the Arab coops of the West Bank and Gaza Strip are under Israeli Military Occupation after 1967, they receive no governmental subsidy. Foreign

institutions, like ANERA, LWF etc, are the most important source of grants and subsidies. Foreign agency involvement with the West Bank cooperatives started after the Israeli occupation. The LWF began in 1974, ANERA, in 1977, gave Rammallah poultry coop a grant.

"Agricultural cooperatives in particular have been denied permission to accept funds from outside sources. For example an agricultural marketing cooperative could not get permission to get a \$500,000 loan from Jordan to build a marketing facility. This cooperative was also turned down fro receiving a \$200,000 grant from a US private voluntary organization for agricultural machinery and land reclamation"²⁶.

Income earned from sales and service projects This source is important because if the cooperative can provide services to members, at suitable prices and with good quality it can also obtain budget for operation and expansion. In the West Bank the Rammallah Poultry Cooperative owns several productive enterprises (feed manufacturing, retail poultry stores and farms for raising sheep and chicken). This coop supplies its members with inputs and markets their product. Still it has problems with high input prices, low membership and inadequate financing.

For a coop to begin productive projects it needs permission from the occupation government, credit, equity capital, good management, government protection from productive competition and a large number of patronizing members.

"Cooperatives on the West Bank and Gaza are cut off from the normal support mechanisms which are usually provided by the government and other institutions, such as Banking

facilities, experimental stations and extension services. Thirty employees of the JCO work on the West Bank. They are principally advisors, but in the case of some larger cooperatives they are managers and employees. Yet there is neither a cooperative educational nor auditing facility as exists at the JCO in Jordan. Further, it is difficult to obtain cooperative credit and other Banking services from Jordan. It should be emphasized, however, that activities through membership equity is impressive: cost of cooperative membership is high (averaging about \$150 and as high as \$3,000) and funding, on occasion, is reaching the cooperatives through official and unofficial channels"²⁶.

Marketing

The marketing problem or access to Israeli, Jordanian and other markets is considered one of the biggest barriers to agricultural coops in the West Bank and Gaza, but also to agriculture and the whole economy. This problem could be divided into two parts, local and foreign marketing.

Local marketing The West Bank and Gaza Strip markets are available to all Israeli products and crops. Local markets receive huge amounts of Israeli agricultural production each year, especially in harvest season. This lowers the local prices and limits Arab production. Arab production cannot enter Israeli markets. The cost of Israeli agricultural production is low compared to the cost of Palestinian agricultural production. Because of input prices subsidies given to the Israeli farmers. Their lower cost of production is also due to the use of more advanced agricultural methods giving higher yield per acre. The opening of the West Bank markets to excess Israeli vegetables and fruits in peak seasons resulted in a huge amount of

Israeli production been shipped to the West Bank markets. This helped prevent gluts on Israeli markets and raised Israeli production prices but as a result the West Bank and the Gaza Strip have surpluses. This will decrease the price in local West Bank markets for the Arab farmers and the competition is unfair. Another source of competition to the Arab agricultural products comes from the Israeli settlers on the West Bank. The Israeli government provides them with subsidies to inputs of production. So that they can sell agricultural product in the Arab markets at low prices.

There are unequal opportunities for the Arab and Israeli farmers.

1. The high cost of marketing, sales commissions, transportation, taxes and boxes.
2. The low yield on average for small Arab farmers and wide variations in quantity and quality.
3. The quality of vegetables and fruits is very low due to inadequate pest control and less improved varieties.

Information about the markets is poor due to the absence of market reporting. The farmers cannot study the supply and demand situation.

4. Lack of good grading, packing, refrigeration and storage facilities for the agricultural products.

Foreign marketing When agricultural production, in some season, exceeds the demand in the local markets. It is necessary to export. Exporting the surplus raises the local prices and keeps it above the

cost of production and make a profit. Second, exporting of surplus is very important to pay for the imports of the West Bank and the Gaza Strip. Vegetables (like tomatoes squash eggplant etc) citrus, and olive oil are produced beyond local needs. The nearest markets are in the Arab countries, especially in Jordan. There are obstacles to export, especially obtaining permission from the Israeli military occupation to export. It is not easy to get these permissions and their cost is high. The cooperatives must pay taxes, fees, and transportation costs. The ease of getting the permission depends on political situation at the time of the harvesting seasons. If there is any riot or protest, the farmers lose their products because they cannot get permission to export. If they have the permission, they maybe forbidden by the Israeli, from crossing the Jordan bridge. The Jordanians side must also put limitations on imports from the West Bank. The maximum amount of export to Jordan is 50% of the expected yield. Permission from Jordan, through their agricultural marketing delegates in each West Bank district, are necessary. The amount of export allowed to Jordan varies with the kind of crop, and season. The Jordanian crop has the first chance at the market. Exportation may also depend on the Jordanian delegate or relation with specific farmer, landowner or merchant or it may have a high cost. There are several problems associated with foreign marketing.

1. Crossing the bridge increases the cost and wastes time.

2. No refrigerator trucks receive permission from the Israeli military occupation to cross the border. When crops go to Jordan for re-export they must be reloaded onto other merchant refrigerator trucks in Jordan. This takes more time, costs more and decreases the ability of West Bank products to compete in the export markets.

Due to local marketing problems barriers to entry to foreign markets, sharecroppers are limited and are monopolized by merchants and commission agents. To overcome this, the farmers need cooperative marketing to unite in groups and organizations to compete. They need to organize as a group in very positive and effective ways. Individual efforts in this situation is both useless and ineffective.

Some agricultural marketing cooperatives, are helping sharecroppers and producers. For example, the Jericho marketing cooperative helps members by obtaining export permission, giving loans, and operating retail marketing stores for farm products in the West Bank and Jordan. Not all marketing projects are successful. In 1977, the Rammallah poultry coop lost about \$3500 in subsidizing member farmers selling poultry at retail below costs of production. In an effort to compete with surplus Israeli production which was sold below cost on the West Bank the Rammallah coop operated at a negative margin.

Cooperative member education

The cooperative organization requires active and informed participation by members. Education of members is important for success

of the cooperative association. This includes not only teaching the principles, objectives, and meaning of the cooperative but also knowledge about routine cooperative operations. "In general it could be said that most members do not know how a cooperative is supposed to function, management committee members have a basic understanding of the by-laws, and the regional office personnel, through well educated and experienced in cooperatives, have no way to transmit that knowledge"¹⁴. There are a few two or three day seminars given to managers and members every one or two years. These do not meet the education needs of the cooperatives. All meetings require permission from the military occupation, which is not easy to obtain.

School cooperatives School cooperatives are an important focus. Prior to 1967, staff of the central cooperative union were assigned to work exclusively with school cooperatives. Most were saving cooperatives, or consumer cooperatives selling school supplies and snack food to students. The savings cooperative had 30,000 student members. Saving coops. made a sizeable deposit in the cooperative Bank which the Bank then loaned to other cooperatives. Each student cooperative elected its own management committee, held meetings, did its own bookkeeping. Students participated in all the steps of running a cooperative association and business. They also had lectures, on the cooperative method. This helped to build educated cooperative members who could graduate from the school cooperatives and then share in operating the adult cooperative movement. There are now about 219

school cooperatives. But only about 180 are active, and many have lost their educational value due to shortage of staff and extension agents. Cooperatives are now viewed by most students as a money making businesses.

The United Nations Development Program proposed in 1978 to establish a training institute on the West Bank to train managers for cooperative and conduct educational programs for committee members and members. The Israeli military government has not given approval to the UNDP plan.

Others

Other problems important to the coop movement, are project approval, land confiscation, and water resources.

"Israeli government policies appear to discourage economic development by Palestinians and their cooperatives- the principal reason for severe limitations on project approval and funding to the West Bank and Gaza cooperatives. In addition, military authorities are reluctant to allow Jordanian funds into the West Bank and Gaza. These funds may be comingled with those of the other Arab countries, with disbursement controlled by the Palestinian Liberation Organization.

"All cooperative projects, from planting olive trees to extending drinking water to the home of members, involve many kinds of approval and permits. Israeli military authorities require many extensive documentation for each project. More frequently than not, they do not act in either approving or disapproving projects. The reason for inaction and long delays in project approvals (which appear to be the rule, rather than an exception) is not clear". Security regulations may also affect cooperatives. For example, a consumer cooperative reports that it could not hold a general assembly because of the restrictions allowing no more than seven persons to meet at a time"²⁶.

APPENDIX D: THE QUESTIONNAIRES

Farmer Questionnaire

First: Introductory Information

1. Name of the farmer.
2. Name of the village
3. Age.
4. Educational level of the farmer.
 - Illiterate
 - Elementary school
 - Preparatory school
 - High school
 - training school
 - college
5. Number of family members.
 - Male
 - female
6. How many of your family members work in agriculture
 - male
 - female
7. How long have you been working as a farmer _____
8. Type of landlord agreement you plan with respect to ownership.
 - Owner _____ dunums

cash rent _____ dunums

Sharecropping _____ dunums.

Second: Farmers Ag. Practices and Problems

1. What was your last year tomato crop (Biological)

Field Box or ton/dunum dunums total

-
-

2. What are the inputs you use for tomato planting and their cost.

Inputs quantity price

- Seedlings
- fertilizer
- Plastic Mulch
- water
- labor

3. What are the main production problems you face with respect to tomatoes.

- Diseases
- weather
- water resources
- price
- marketing
- others

4. Why don't you raise more tomatoes?

- cash shortages

- water resources
 - marketing
 - labor
 - prices
 - land
5. Can you plant more dunums if you are provided by land
- yes
 - No

If yes: Number of dunums without pre harvest wage labor

_____ dunums

number of dunums with pre harvest wage labor

_____ dunums

6. methods of irrigation and agriculture

method	dunums	yield/dunum	cost/dunum
drip with plastic			
green houses			
other			

Third: Relationship with Landowners

1. With respect to land renting. How much you pay as
rent _____ JD/dunum/year
2. For sharecropping arrangement. What is the arrangement, who
decides?
- | surface | % cost share | decision |
|--------------------|--------------|----------|
| • purchased inputs | | |
| • hired labor | | |

- Transport
 - commission
 - boxes
3. Is the landlord himself the merchant?
- yes
 - No
4. Does the land lord provide you with housing?
- Yes
 - No

if yes

-number of rooms _____

-Housing facilities

- electricity
 - water
 - kitchen
 - restroom
5. Quantity, cost, and source of agricultural sources for your tomato production for the last two years. (source 1=himself, 2=coop., 3=merchant).

services	1983	1984
	quantity cost source	quantity cost source

Inputs;

seeds

fertilizers

plastic

drip system

Loans

cash

non-cash

marketing

export permissions

Jordan

West Bank

boxes

sales commissions

in West Bank

in Jordan

'Fourth: Marketing of Farmers Production'

1. Who decides where to sell the tomato crop
 - farmer
 - landlord
 - both
2. who decides when to sell the tomato crop?
 - farmer
 - landlord
 - both
3. How did you sell your last crop?
 - Jordan _____ boxes or tons
 - West Bank _____ "
 - Gaza strip _____ "

- Israel _____ "
 - On the streets _____ "
 - Not sold _____ "
4. What are the reasons for not selling all of the crop?
5. Cost to get export permission
- Into Jordan _____ JD
 - From West Bank _____ JD
6. Cost of transportation per box
- | | By landlord truck | by others |
|-----------------------|-------------------|-----------|
| To Jordan | | |
| To West Bank and Gaza | | |

'Fifth: Farmers and Agricultural Cooperatives'

1. Are you a member of a coop. organization
- Yes
 - No

If yes name it

For how long you have been a member _____ years

If no Why

2. If you are a member what are the services offered to you by your coop.
- Supply inputs
 - get export permissions
 - cash loans
 - extensions
 - marketing

3. What do you think that coops. should do in addition to the current services.

- With respect to provision inputs

- with respect to provision loan cash

- with respect to marketing

4. do you think the agricultural cooperative could replace the merchant?

- Yes How?

- No Why?

Agricultural Cooperative Questionnaire

1.

Name of the cooperative _____

2.

Location _____

3.

Establishment year _____.

date of registration in the West Bank _____

Jordan _____

4. Objective

-
-
-
-

5. Services provided by the cooperative:

-
-
-
-

6. Distribution of members with respect to type of tenure
system used, village

Type	Marj Na'ja	Zebydat	Jeftlik	Others
------	------------	---------	---------	--------

Cash rent

Sharecropper

Landlords

Landlord-Merchants

7. Education level of the board of the board of director

educational	small	share	landlord	landlord
level	own	cropper		merchant

- No school
- Preparatory
- High school
- Training
- college

8. Distribution of the board of director according to occupation and position

Position	small	owner	share	landlord	landlord	origin
	farmer		cropper		merchant	

- Chairman
- vice president
- treasurer
- secretary
- member

9. Do you think that the coop. can provide all of the services needed to the farmers?

- Yes
- No

If no, what are the limitations?

-
-

-
-
- 10. What are the main problems that face the coop.?
 -
 -
 -
 -
 -
- 11. What are the duties of the director?
 -
 -
 -
- 12. What are the duties of the chairman?
 -
 -
 -
- 13. How is the decision taken in the cooperative?
 - By the director
 - By the chairman
 - By the board of director
- 14. What are the cost of marketing to the farmers?

	1984	1983		
	cost	source	cost	source
Export permission				
Jordan				

West Bank

Transportation to

Jordan

local

Boxes

Sales commission

Jordan

West Bank

Leader Village Questionnaire

1. Name of the village
2. Name of Respondent
3. Position of respondent
4. Age
5. Job
6. level of education
7. Number of village households.
8. Total area _____ dunums
 - Fully irrigated ag. land (now) _____ dunums,
(before) _____ dunums
 - Partially irrigated " " (now) _____ dunums,
(before) _____ dunums
 - Building area _____ dunums
 - Uncultivated land _____ dunums
 - Dry land _____ dunums
9. Water resources
 - Wells _____ number
 - springs _____ number
 - rainfall _____ mcm
10. Distribution of cultivated land with respect to
different kinds of villages for several years

Type of	Marj Na'ja			Zebydat			Jeftlik			Total		
crop	82	83	84	82	83	84	82	83	84	82	83	84

tomato
 squash
 cucumber
 eggplant

11. If there is a decrease in dunum, what do you think the reasons?

- Confiscation of the land
- Limitation of water resources
- Limitation of inputs supplied
- Limitation of marketing
- others

12. Distribution of crops yield with respect to different types and methods used (standard) (tons/dunum)

Type	dry	drip irrigation with plastic	uncovered tunnels	green houses
------	-----	---------------------------------	----------------------	-----------------

Tomato(1)

Tomato(2)

Squash(1)

Squash(2)

Cucumber(1)

Cucumber(2)

Eggplant

13. Distribution of water production due to seasons

- Winter

Wells _____ mm³.

Springs _____ mm³.

rainfall _____ mm³.

- Summer

Wells _____ mm³.

Springs _____ mm³.

14. Are there any limitation on using water?

- Yes
- no

if yes, How?

When?

15. Problems you face with water resources?

-
-

16. Cost of water for each family is determined by:

-
-

17. Ways of collecting and saving water

- small bowls
- water storage for each house
- water storage for each village
- others

18. Methods of water distribution among farmers.

- land planted, owned
- Money paid (price)
- Holding shares
- Others

19. Time of distribution the water among the farmers.

-
-
-
-

20. Problems that face the village in general

-
-
-
-

BIBLIOGRAPHY

1. Abu Arafa, Abed A. I. The Jordan Valley. Arab Studies Society, Jerusalem, February 1984.
2. Abu Arafa, Abed A. I. Settlement The Practical Application of Zionism. Abu Arafa Publications, Jerusalem, February, 1981.
3. Abu Howayej, Burhan. Analysis of Farm Systems in Irrigated Areas of Jordan. University of Jordan, Jordan, September, 1983.
4. Alamery, Anan. The Palestinian Agricultural and Industrial Development, 1900-1970. Jerusalem, West Bank, 1981.
5. Arabiat, Suleiman. System Analysis of Agricultural Marketing. University of Jordan, December 1983.
6. Awartani, Hisham M. Agriculture A Palestinian Agenda for the West Bank and Gaza. American Enterprise Institute, Washington DC, 1980.
7. Awartani, Hisham M. Water Policy. Jerusalem, Arab Thought Forum, 1981.
8. Dajani, Jarir. A Baseline Socio-Economic Study of the Southern Chors and Wadi Araba. Amman, 1979.
9. Davis, Uri; and Maks, Autoni, E. L. Israel's Water Policies. Journal of Palestine Studies 9, No 2 (Winter 1980).
10. Ebidat, Adnan. Agricultural Cooperatives. Arab Thought Forum, Jerusalem, West Bank, 1981.
11. Jordan, Department of Cooperative. Annual Report 1953-1954. Amman, Jordan, 1954.
12. Israeli Statistical Abstracts and Administered Territories Statistics. Central Bureau of Statistics, Jerusalem, different years.
13. Istanbouly, Daoud; Abu Arafa, Abed; and Alazzeah, Yusef. Agriculture Realty in the Occupied Territories and the Necessities of Development. Arab Thought Forum, Jerusalem, 1981.
14. Khraish, Abdul Rahman, and Zebersole, Jon. West Bank Agricultural Coop A Case Study in Institutional Study Under Military Occupation. Jerusalem, West Bank, August 1980.

15. Mattar, Ibrahim. Israeli Settlements in the West Bank and Gaza Strip. Journal of Palestinian Studies pp 142, 11, No 1 (Autumn 1981).
16. Nakhleh, Emile A. The West Bank and Gaza, Toward the Making of Palestinain State. American Enterprise Institute, Washington, D.C., 1979.
17. Naser, Souad, and Khamisa, Ahmed. Program for Devoloping the Jordan Valley. Haifa, 1983.
18. Sandler, Shmule; and Frisch, Hillel. Israel, the Palestinian, and the West Bank. Lexington Books, D.C., Heath and Company, Boston, Massachusetts, 1984.
19. Schwarz, Jehoshua. Water Resources in Judea, Sameria, and the Gaza Strip. Judea, Sameria, and Gaza, Views on the Present and Future. American Enterprise Institute, Washington D.C., 1982.
20. Statistical Bulletin for the West Bank and Gaza Strip. Rural Research Center An-Najah National University, Nablus, West Bank, 1980.
21. Steiteh, Akram M.; Beqaeen, Akram; Habbab, Sameer; and Abbas, Mohd. Falah. A Manual for the Main Vegetable Crop Grown in the East Jordan Valley. University of Jordan, 1978.
22. Steiteh, Akram M; and Musa. Abd. Hameed. Vegetables Grown Under Plastic Covers and Drip Irrigation Systems in the East Jordan Valley. University of Jordan, 1980.
23. Tamari, Salim; and Giacaman, Rita. Zbeidat The Social Impact of Drip Irrigation on a Palestinian Peasent Community in the Jordan Valley. Birzeit University, Birzeit, West Bank, 1981.
24. Tamari, Salim. The Dislocation and Reconstruction of a Peasentry. The Social Economy of Agrarian Palestine in the Central Highlands and the Jordan Valley, 1960-1980. University of Manchester, September, 1983.
25. United Nations Economic Commission for Western Asia. The Industrial and Economic Trends in the West Bank and Gaza Strip. United Nations, Geneva, December, 1981.
26. U.S. Cooperative Representatives. Palestinian Cooperative on the West Bank and Gaza. Jerusalem, 1984.