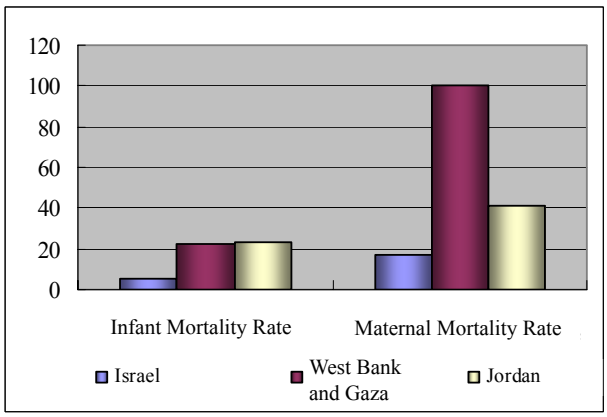
ANNEX

Current Situation of Jordan Rift Valley Area

ANNEX 1: CURRENT SITUATION OF SOCIAL DEVELOPMENT

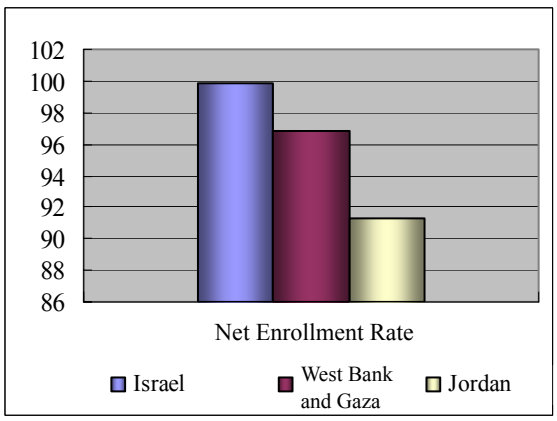
1. Overview

The health and basic education indicators for the West Bank and Gaza are relatively better than those for lower middle income countries. After the Second Intifada, however, the progress in social and human development has been reversed due to the increased poverty affecting families as a result of the Israeli imposed closure. The Medium Term Development Plan 2005-2007 (MTDP) states that, if the current situation persists, the standards of health and education are likely to suffer long-term damage[1]. In addition, when compared to the Millennium Development Goals (MDGs) indicators for health and education in Israel and Jordan, the weak performance of the West Bank and Gaza is evident in the maternal mortality rate.



Source: UN MDGs website database

Figure 1.1.1 Infant Mortality Rate (per 1,000 live births) and Maternal Mortality Rate (per 100,000 live births) 2003



Source: UN MDGs website database

Figure 1.1.2 Primary Net Enrolment Rate 2001

In addition to health and education, gender issues and deteriorating living standards, particularly individual financial conditions, are the primary concerns for social development.

2. Current State of the Health System

Since the Second Intifada, the number of primary health care (PHC) centers has increased following the efforts of the MoH and NGOs. This reflects the growth in the population. However, the health status of Palestinians is recognized to have deteriorated in certain respects, such as in the infant mortality rate (IMR).

[1] Medium Term Development Plan 2005-2007, p. 22

Maternal and Child Healthcare

The IMR has been on an upward trend in the West Bank because of a deterioration in the quality of services resulting from a shortage of resources as well as the closure. This trend is also identified in the Jericho governorate, as set out in the following table. With regard to the maternal mortality rate (MMR), although the statistics of the MoH show a low rate, the UN agencies reported 100 maternal deaths per 100,000 live births (adjusted) in 2003[2]. This implies that the reporting system is not well established and there are many cases of unreported or under-reported maternal mortalities.

Table 1.2.1 Selected Indicators for Health

	Infant Mortality Rate (per 1,000 live births)				Maternal Mortality Rate (women aged 14-49 yrs) (per 100,000 live births)			
	2000	2002	2003	2004	2000	2002	2003	2004
West Bank and Gaza	22	23.3	16.5	20.5	N.A	13.8	12.7	10.6
West Bank	9.8	18.4	11.2	14	N.A	7.6	6.7	3.4
Jenin	17.2	29	21.1	18.5	N.A	N.A	N.A	N.A
Jericho	5.6	17.9	6.3	13.8	N.A	N.A	N.A	N.A
Gaza	22	23.3	24	20.5	N.A	21.6	21.3	20

Source: Health Status in Palestine Annual Report 2002, 2003 and 2004, MoH and PHIC

Access to Healthcare Facilities

The main healthcare service providers are: the MoH, the UNRWA, and NGOs, with shares of 56.5%, 7.3% and 36.3% respectively[3]. Since the Second Intifada, the MoH has been suffering under the burden of emergency actions and development policies. With regard to the Jericho Governorate of Health[4], access to health services, including the number of ambulances available, is relatively better (as shown in the following table). The health facilities in the Jenin governorate, which includes the Tubas area within its coverage, serve a larger population than those of the Jericho governorate. This is largely due to the geographical position of the governorate, being a crossing point to the neighboring country of Jordan. This means that the healthcare facilities in the Jericho governorate serve a larger population than that of the governorate.

Table 1.2.2 Distribution of Primary Health Care Services and Ambulances in West Bank and Gaza

	PHC Providers			Total No. of PHC	pop./center		Ambulance Providers*			Total No. of Ambulances	Pop. / Ambulance
	MoH	NGOs	UNRWA		Total	Public	MoH	PRCS	NGOs/ Private		
West Bank	357	214	35	606	3,796	6,443	28	46	39	113	20,357
Jenin	51	29	6	86	3,394	5,723	3	6	1	10	29,185
Jericho	16	5	3	24	1,705	2,557	1	3		4	10,227
Gaza Strip	56	51	18	125	10,698	23,879	0	0	0	0	0
Total	413	265	53	731	4,976	8,808	28	46	39	113	33,079

Source: Annual Report 2003 and 2004 and statistics from the MoH

[2] Human Development Report 2005, UNDP, and UNICEF statistics
[3] Annual Report 2004, MoH, p. 14
[4] The Governorates of Health and Education have geographically different coverage: Jericho Governorate of Health includes the Jordan Rift Valley from the Dead Sea to the Lake Kinneret.

According to the socioeconomic survey (SES) carried out by the JICA Study Team and summarized in Appendix[5], it takes an average of 28.4 minutes to access the nearest health center in the target area, while for the population of the Jordan valley villages of Nablus, having the worst access, it takes 48.7 minutes. However, at the PHC level, most PHC centers have only a limited number of doctors' visits, varying from one per week to five per week (except Jericho[6]), even though the access is acceptable (except in respect of the Jordan Valley villages of Nablus). The following table shows the access to healthcare facilities by region and the average time taken to reach the healthcare centers.

Table 1.2.3 Access to the Health Centers and Average Time Taken

	Hospital	Clinic	Public Health Center	Others	Average time to access health facility (min)
Jericho	31.7%	20.2%	47.1%	1.0%	19.1
Al 'Auja	27.6%	50.0%	20.4%	2.0%	27.9
Tubas	3.0%	39.4%	51.5%	6.1%	18.1
Area Surrounding Tubas	1.0%	62.6%	35.4%	1.0%	16.6
Jordan Valley Villages of Nablus	26.0%	37.5%	31.3%	5.2%	48.7
Overall	17.9%	41.7%	37.3%	3.0%	28.4

Source: Socioeconomic survey, JICA Study Team (See Appendix)

Access to the facilities does not necessarily represent better access to health professionals. As seen in the table below, some facilities receive a very limited number of visits by doctors.

Table 1.2.4 Number of Visits by Doctors to PHC's and the Number of Health Workers in Jericho

Locality	Population	No. of Doctors' Visits/Week	No. of Nurses	No. of Midwives	No. of Primary Health Guides
Al 'Auja	3,886	5		1	
Al Jiftlik	4,264	5	1		1
An Nuwei'ma	1,128	1			2
Az Zubeidat	1,299	2	1		
Ein ad Duyuk al Foqa	789	1			
Ein ad Duyuk at Tahta	937	1			1
Fasayil	872	3	1		
Jericho	19,783	16	7	3	2
Marh Na'ja	743	2	1		
Bardala	1,528	2	1		1
Ein el Beida	1,048	2	1		1

Source: Public Health, Jericho Governorate, MoH

[5] The socioeconomic survey was carried out in November 2005, with 505 samples in 12 communities in the area of Jericho Municipality, Al 'Auja Municipality, Tubas Municipality, the Area surrounding Tubas (Tammun Municipality, Aqqaba Municipality, Tayasir) and the Jordan Rift Valley villages of Nablus.

[6] Jericho (Ariha) has 16 doctors' visits per week.

Quality of Facilities and Human Resources

The services provided at the PHC level and at the hospital level in the target area do not satisfy the population in terms of the quality of human resources and infrastructure/facilities, which are partially provided for by the insurances paid by the population[7].

According to the socioeconomic survey, the level of satisfaction was particularly low regarding the facilities (overall score of 2.73 out of 5). The lowest satisfaction level was in respect of the population in the Jordan Valley villages of Nablus regarding location and access, since their access is the farthest. The population in Al 'Auja also expressed a lower level of satisfaction regarding doctors, although a doctor is present in Al 'Auja at least five days per week. In fact, the population of Al 'Auja utilizes the hospital rather than public health centers and therefore their low level satisfaction is more about the service provided by hospitals.

Table 1.2.5 Degree of Satisfaction by Services and Region (Health Services) (Scale: 1<5)

	Location and access	Doctor	Nurse	Hospital/clinic facilities	Charge for services
Jericho	3.18	2.84	2.81	2.50	3.14
Al 'Auja	2.77	2.44	2.86	2.64	3.09
Tubas	3.25	3.36	3.33	3.01	3.10
Area surrounding Tubas	3.15	3.14	3.31	2.98	3.12
Jordan Valley villages of Nablus	2.02	2.77	2.81	2.55	2.63
Overall	2.88	2.91	3.02	2.73	3.02

Source: Socioeconomic survey, JICA Study Team (See Appendix)

The degree of satisfaction by type of facilities shows a low level of satisfaction regarding hospitals in general. This relates to all aspects of hospital-related services such as access, quality of human resources and facilities and service charges.

Table 1.2.6 Degree of Satisfaction by Type of Facilities (Health Services) (Scale: 1<5)

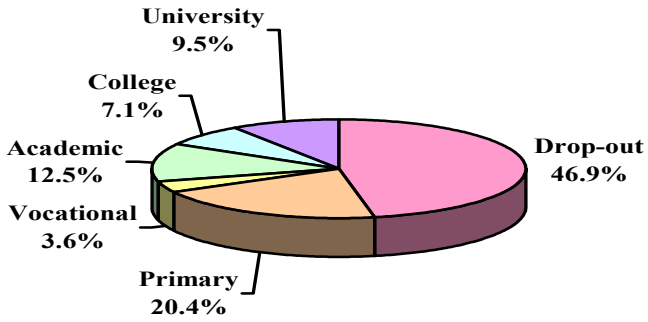
	Location and access	Doctor	Nurse	Hospital/clinic facilities	Charge for services
Hospital	2.48	2.66	2.51	2.24	2.74
Clinic	2.98	2.93	3.11	2.77	3.04
Public Health Center	3.01	2.99	3.15	2.94	3.18
Others	2.33	3.13	3.13	2.53	2.33
Average	2.88	2.91	3.02	2.73	3.02

Source: Socioeconomic survey, JICA Study Team (See Appendix)

[7] In general, unless health insurance is paid (at 5% of salary up to a maximum of NIS 75 per month), a patient cannot receive any services at the public PHC centre nor at the public hospital. After the Second Intifada, insurance called 'Aqsa Insurance' was introduced, which has enabled the poor to receive public health services without paying the above mentioned health insurance.

3. Current State of the Education System

Basic education[8] is compulsory in West Bank and Gaza and the net enrolment rate (NER) reached 93.7% in 2001/2002, which is relatively high in Western Asia countries[9], though some deterioration of the NER was reported in 2003 (91.9%)[10]. The Ministry of Education and Higher Education (MoEHE) administers 74.9% of the general education, while the UNRWA and the private sector administer 12.9% and 12.2% respectively[11]. The MoEHE has been performing well over the short period since its establishment. The students in the current education system enjoy a general education with little dropping-out compared to their parents' generation. The results of the socioeconomic survey show that nearly half of the heads of households that were surveyed were drop-outs from primary education, as set out in the following figure and table.



Source: Socioeconomic survey, JICA Study Team (See Appendix)

Figure 1.3.1 Education Level of the Head of the Household

Drop-outs

There continue to be problems in connection with students completing their basic education and continuing into secondary education (where the NER in 2002/2003 was 84%[12]). In grade 10, the percentage of drop-outs were 3.8% and 3.6% for boys and girls respectively, while in grade 8, 2.1% and 1.2% were drop-outs[13]. This problem is largely due to the economic hardship of the students' families. It also bears some relation to the deteriorating quality of the system, which is failing to meet the particular needs of students and society, including the needs of the labor market, due to the political and economic situation in the West Bank and Gaza.

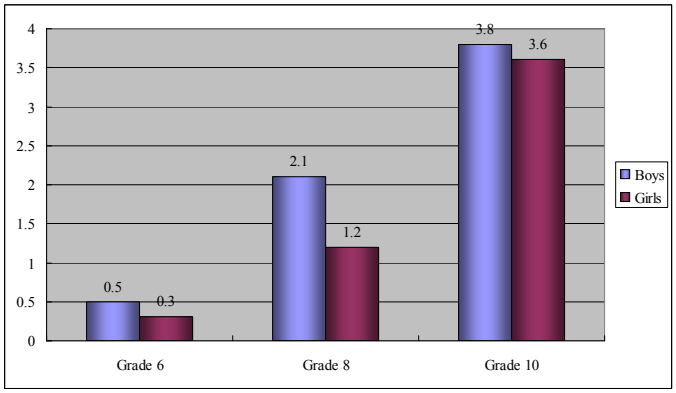
[8] In Palestine, 'General Education' consists of a basic education of Grades 1 to 10 and secondary education of Grades 11 to 12. General Education is compulsory, but not 'free'.
[9] 83% in 2001/2002 in Western Asia (which the West Bank and Gaza (OPT) is categorized as falling within), The Millennium Development Goals Report 2005, United Nations, p. 10
[10] Palestine Human Development Report 2004, Birzeit University, p. 164
[11] Education for All, Part One: Diagnosis and challenges, Summary Report 2004, p. 9
[12] Human Development Report 2005, UNDP
[13] Percentage of Dropouts in Government Schools 2002-2003, Enhancing Quality Education in Palestinian Schools, Project Proposal, UNESCO

Table 1.3.1 Selected Indicators for Education

	Net Enrolment Rate		Drop-out Rate		Repetition Rate	
	2001/2002	2002/2003	2001/2002	2002/2003	2002/2003	2003/2004
Basic Education	93.7	N.A	0.8	0.7	N.A	1.4
Secondary Education	N.A	N.A	3.1	3.7	N.A	N.A
All Levels	N.A	N.A	0.9	1	N.A	N.A

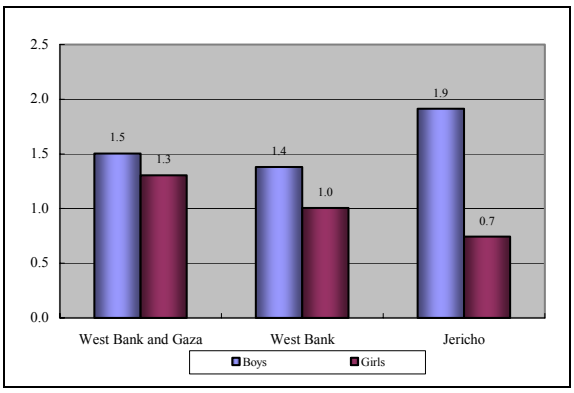
Source: Education for All, Summary Report 2004, and statistics from MoEHE

Gender disparity in basic education is almost non-existent and, in fact, girls perform better in terms of the repetition and drop-out rates. However, drop-outs by girls at the secondary education level are noticeable in rural areas due to early marriages, which may be connected to the economic situation of their families as well as traditional customs. In the case of boys, the main reason for drop-outs is reportedly due to the economic situation of their families. In fact, the socioeconomic survey revealed that one of the main reasons for borrowing money was for parents to educate their children.



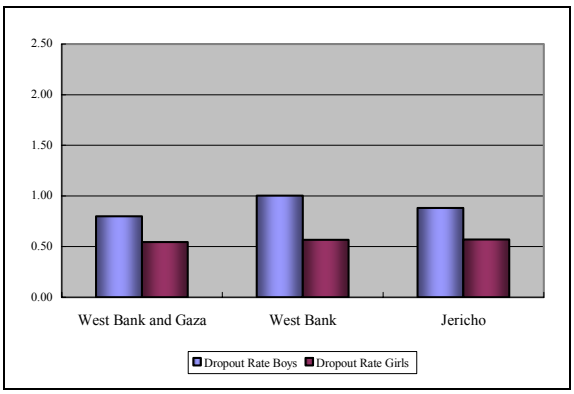
Source: Enhancing Quality Education in Palestinian Schools, Project Proposal, UNESCO

Figure 1.3.2 Percentage of Drop-Outs in Government Schools 2002-2003



Source: MoEHE statistics

Figure 1.3.3 Percentage of Repetition in Government Schools 2004



Source: MoEHE statistics

Figure 1.3.4 Percentage of Drop-outs in Government Schools 2004

Access to Basic Schools

In the Jordan Rift Valley area, according to the socioeconomic survey, access to schools is considered to be reasonable since on average the students in the area travel 17.9 minutes to school, over a distance of 1.51 km.

School Environments

The number of students per classroom in the public education system is, on average, 30 in Jericho and 35 in Tubas. However, the sizes of the classrooms differ and are not necessarily appropriate for the number of students and classrooms are often overcrowded. This often occurs due of the usage of the rooms for different purposes, such as a storage room or laboratory, due to the shortage of classrooms.

Table 1.3.2 Distribution of Teachers and Students, 2005/2006

	No of Students				No of Classrooms				Students per Classroom			
	Total	Public	Private	UN RWA	Total	Public	Private	UN RWA	Total	Public	Private	UN RWA
Jericho	11,019	6,303	1,340	3,277	349	217	46	86	32	30	29	38
Tubas	11,192	11,003	189	0	325	311	14	0	34	35	14	0

Note: The number of students was surveyed in September 2005.
Source: MoEHE statistics

In addition, some classrooms are rented from private sector businesses or other ministries and are not appropriate to be used as classrooms. The rent is paid by the LGUs and is resulting in a financial burden for the LGUs.

Table 1.3.3 Distribution of General Schools, 2005/2006

	Total No	Public			Private	UNRWA	No of caravan schools	No of rented classrooms	No of double shifts
		Boys	Girls	Coed	Coed	Coed			
Jericho	27*	5	6	9	4*	3	1	11	4
Tubas	27	11	9	4	3	0	0	34	0

Note: * This number includes schools with special needs.
Source: MoEHE statistics

Quality of Teaching

The MoEHE endeavors to bring about an improvement in the quality of teaching, introducing IT education within general education. Their efforts have been towards the School Net, which equips computer laboratories for students to use and improve their learning[14]. In addition to the School Net, a program called the Palestinian Education Initiative (PEI) was launched in 2005, following the Jordan Education Initiative. This program introduces e-learning for students and teachers and is unique as it is a program initiated on an inter-ministry basis (MoEHE and Ministry of Telecommunications) and with collaboration from the private sector and international donor agencies. The PEI will pilot 146 schools in the first phase (3 years), facilitating internet and e-learning curricula. This program will also open the

[14] Nearly half of Palestinian public schools have computer laboratories.

school facility to the public and intends to provide opportunities for access to IT for communities, developing the national strategy for lifelong learning.

Table 1.3.4 Number of General Schools with Computers, 2005

	Public	Private	Refugee camp
Jericho Governorate	7	2	2
Tubas District	11	0	0

Source: MoEHE statistics

Technical and Vocational Training

In compared to academic education, there are no technical or training schools registered under the MoEHE in the region. The MoEHE, in collaboration with the Ministry of Labor, has been working on the Technical and Vocational Education and Training (TVET) however the target area has not yet benefited from this strategy. Following demand from the population, there are some NGOs which are giving certain courses on vocational training.

Table 1.3.5 Distribution of Vocational Training Schools, 2004

	Total Number		Specialties			
	Public	Private	Agriculture	Industrial	Commercial	Others
West Bank and Gaza	79	4	2	14	66	1
West Bank	75	4	1	12	65	1
Jenin	9			1	8	
Nablus	7			1	6	
Salfit	6			1	5	
Tulkarem	8			1	7	
Qalqilia	6			1	5	
Ramallah	2	2		2	1	1
Jerusalem Suburbs	2	1		1	2	
Jerusalem	1			0	1	
Bethlehem	5	1		1	5	
Jericho	0	0		0	0	
Hebron	14		1	1	12	
South Hebron	9			1	8	
Qabatya	6			1	5	
Gaza Strip	4	0	1	2	1	

Source: MoEHE statistics

The people surveyed in the target area were mainly satisfied with the “access to school”, “school teachers” and “education of basic knowledge” aspects of academic education, while the levels of satisfaction were particularly low for the “job placement services after graduation” and “vocational education” aspects, as shown in the following table. The population also notices the poor condition of the school facilities.

Table 1.3.6 Degree of Satisfaction by Region (Education) (Scale: 1<5)

	Location and access	School teacher	School Facilities	Job placement services after graduation	Basic knowledge	Vocational education	Cost for education
Jericho	3.43	3.10	2.71	2.04	3.05	2.49	3.10
Al ʿAuja	3.53	3.33	3.02	1.99	3.12	1.94	3.04
Tubas	3.23	3.30	2.75	2.08	2.96	2.47	2.63
Area surrounding Tubas	3.26	3.68	2.88	2.19	3.37	2.42	2.53
Jordan Valley villages of Nablus	2.84	3.29	2.79	1.95	2.80	1.78	2.74
Overall	3.26	3.34	2.83	2.05	3.06	2.22	2.81

Source: Socioeconomic survey, JICA Study Team (See Appendix)

4. Current Gender Issues

Women constitute 49% of the total population in the West Bank and Gaza[15]. As described above, in terms of education there is almost no gender disparity at the basic education level, while the female student drop-out rate is noticeable at the secondary level. According to statistics of the Ministry of Women's Affairs (MoWA), the female student drop-out rate was 4.8% in 2003, while the rate for males was 2.9%[16]. This is due to early marriages and, in fact, statistics show that the average marrying age for females is 19.4 years old, while the age for males is 24.6[17]. Early marriage leads to a high total fertility rate (4.9 in 2002), although there has been a decrease in this rate[18]. At the same time, there are a considerable number of women who follow academic courses. At local universities, women constitute 45% and 28% of higher education graduates[19]. However, their participation in the social, economic and political spheres remains limited.

Participation in Economic Activities

In economic activities, women constitute less than 20% of the labor force, as shown in the table below, although women participating in agriculture represents a significant percentage.

Table 1.4.1 Distribution of the Labour Force over the Age of 15

		2003			2004		
		Female	Male	Ratio of females to males	Female	Male	Ratio of females to males
Distribution of the labor force over the age of 15		17.2 %	82.8 %	20.8 %	18.6 %	81.4 %	22.9 %
% of the labor force according to economic activity	Agriculture	38.1 %	61.9 %	61.6 %	40.1 %	59.8 %	66.9 %
	Industry	10.1 %	89.9 %	11.2 %	12.1 %	87.7 %	14.0 %
	Services	16.7 %	83.3 %	20.0 %	17.7 %	82.3 %	21.6 %

Source: Palestine Human Development Report 2004, Birzeit University

[15] Strategy, Structure and Interim Work Plan (March 2004), MoWA
[16] Statistics for the year 2003-2004, MoWA, website
[17] Palestine Human Development Report 2004, Birzeit University, p. 168
[18] Millennium Development Goals, EMRO, WHO website
[19] Statistics for the year 2003 – 2004, MoWA, website, The TFR published in 2004 by PCBS was 5.6 in the West Bank and Gaza (5.2 in WB and 6.6 in GS), while MoH reports 4.19 in 2004 (3.7 in WB 5.5 in GS).

Participation in Political Activities

In terms of the participation of women in political activities, there are five women out of 88 members in the Palestinian Legislative Council (PLC) and two female ministers among fifteen ministries. The participation of women in municipal and village councils consists of only one percent of the total[20].

Empowerment at the Individual Level

At the household level, it is recognized that the proportion of female household heads has increased to 11 percent and that the overall percentage of poor families headed by women is greater than that of poor families headed by men[21].

However, contrary to the statistics, women are active in social matters at a local level, although quantitatively this is not noticeable. The MoWA points out that women and non-governmental organizations have played a central role in promoting community and women's issues, as well as responding to the needs of poor families in the absence of governmental support.

Indeed, in the target area, women and their groups possess extensive experience in working with and for women in education, health and vocational training, as compared with men. However, the development of different organizations depends on their ability to access external information and funding. During the study period, three women's seminars were carried out; one in Tubas Municipality and two in Jericho Municipality, in collaboration with the JICA Study Team[22]. In these seminars, the women claimed that they had individually been active; however, successful cohesion of their relationships and improvement of their situations through networking and lobbying has not been possible. Their decision-making and policy-implementation positions are still limited, both in the wider social context and at the national level.

As shown in the table below, women in the Jordan Rift Valley areas spend more time on housekeeping than on income-related activities (except for agriculture). On average, 18.4% of women are engaged in agricultural activities.

[20] Strategy, Structure and Interim Work Plan (March 2004), Annex 1, MoWA
[21] Palestine Human Development Report 2004, Birzeit University, p. 63
[22] In Tubas Municipality, three seminars were held: the first seminar on food processing business by YWCA Jericho in December, 2005, the second seminar on the introduction of micro-credit by Caritas in February 2006, and the third seminar on business examples using micro-credit by ASALA in March 2006. In Jericho Municipality, two seminars were held with the intention of establishing a women's network with the initiative of Jericho Municipality: the first seminar discussed the idea of establishing a women's network, and the second seminar discussed how to establish the women's network.

Table 1.4.2 Women's Activities

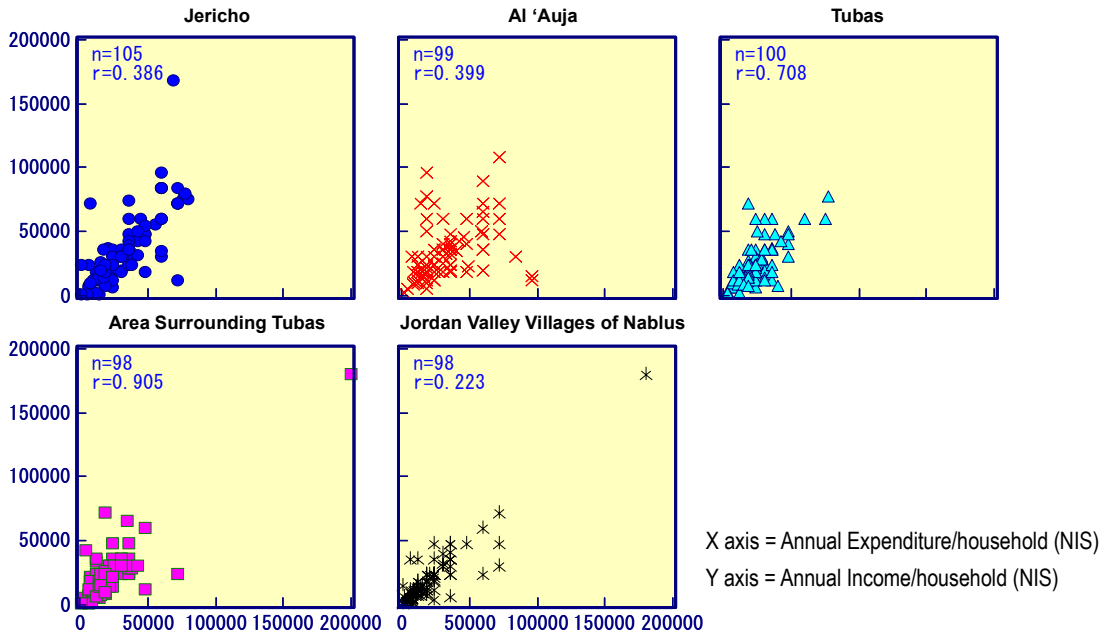
Area	House work (cooking, cleaning etc.)			Management of family expenditure			Agricultural activities		
	Never	Some-times	Always	Never	Some-times	Always	Never	Some-times	Always
Jericho	14.4%	1.9%	83.7%	53.3%	28.6%	18.1%	84.8%	13.3%	1.9%
Al 'Auja	1.0%	0.0%	99.0%	68.0%	21.0%	11.0%	84.0%	11.0%	5.0%
Tubas	16.0%	2.0%	82.0%	59.0%	26.0%	15.0%	88.0%	8.0%	4.0%
Area surrounding Tubas	20.0%	1.0%	79.0%	52.0%	26.0%	22.0%	79.0%	15.0%	6.0%
Jordan valley villages of Nablus	9.1%	0.0%	90.9%	77.0%	13.0%	10.0%	72.0%	12.0%	16.0%
Overall	12.1%	1.0%	86.9%	61.8%	23.0%	15.2%	81.6%	11.9%	6.5%
Area	Making handicrafts for selling			Small scale businesses (self-employed)			Working in offices (employee)		
	Never	Some-times	Always	Never	Some-times	Always	Never	Some-times	Always
Jericho	98.1%	1.9%	0.0%	96.2%	1.9%	1.9%	87.6%	0.0%	12.4%
Al 'Auja	96.0%	4.0%	0.0%	97.0%	3.0%	0.0%	92.0%	5.0%	3.0%
Tubas	99.0%	1.0%	0.0%	93.0%	5.0%	2.0%	92.0%	2.0%	6.0%
Area surrounding Tubas	97.0%	2.0%	1.0%	94.0%	4.0%	2.0%	96.0%	0.0%	4.0%
Jordan valley villages of Nablus	95.0%	3.0%	2.0%	95.0%	2.0%	3.0%	98.0%	1.0%	1.0%
Overall	97.0%	2.4%	0.6%	95.0%	3.2%	1.8%	93.1%	1.6%	5.3%

Source: Socioeconomic survey, JICA Study Team

In 2003, the MoWA was created with the mission of reintegrating Palestinian women into a society that promotes their skills by stimulating, supporting and empowering them to participate in the development of programs. They aim to i) upgrade the governmental political commitment in the ministries, ii) link the lobbying and advocacy activities, and iii) building a network of links between women's governmental institutions, NGOs and human rights organizations. Along with these objectives, women's research centers have been launched and one of these centers has been established in Jenin. These centers serve as an information center for women and also as a base for the exchange of information and experience. However, women in rural areas may not benefit from these centers, as their mobility is limited as a result of tradition as well as due to checkpoints.

5. Current Standard of Living

In the socioeconomic survey, the average expense/income ratio proved to be almost as high as 100% in the majority of the five areas surveyed, regardless of the income level. The average income is NIS 28,538, while the average expenditure is NIS 27,471 in total. Lower levels of income/expenditure are more prevalent in the Tubas District and the Jordan villages of Nablus, as shown in the figure below.



Source: Socioeconomic survey, JICA Study Team

Figure 1.5.1 Income and Expenditure in the Jordan Rift Valley Area

Unemployment is as high as 26.8% (2004) in West Bank and Gaza. The population in the target area suffers from unemployment, as shown in the figure below.

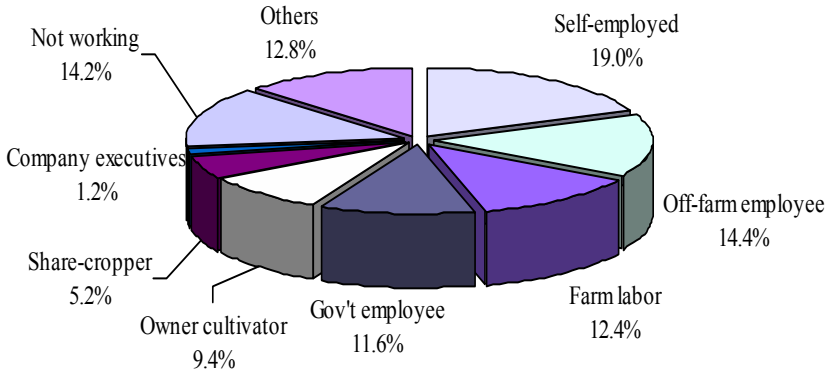


Figure 1.5.2 Main Occupation of the Heads of Households

Residents also point out that the difficulties experienced in accessing markets, due to checkpoints and the closure, prevent them from gaining profits from their products, which results in them being the working poor.

6. Current Micro-finance Issues

The results of the socioeconomic survey reveal certain features regarding borrowing behavior in the Jordan Rift Valley areas. The results indicate that micro-finance is not yet commonly used nor widely known about among the people in the region.

Borrowing Tendency

As set out in the following table, more than 70% of the people have never or seldom borrowed money. This tendency does not significantly vary over the five areas surveyed. In the case of borrowing, females borrow more often than males. On average, the amount borrowed corresponds to 64% of household income and the dependence on borrowing is relatively higher in Jericho and Tubas than in other areas. The main reason for this seems to be the higher expense/income ratio, regardless of the level of income. The average interest rate or equivalent commission is less than 4% which is lower than that of private banks (estimated to be around 6% to 8% as of 2005 for well-mortgaged borrowers), reflecting the nature of the borrowing source.

Source of Borrowing

In most cases, people tend to borrow money from their relatives or friends and few people go to banks or micro-credit associations. At present, micro-credit and governmental credit are not well utilized as compared with private banks.

Reason for Borrowing

The top three reasons for borrowing are house construction and renovation, children's education and daily goods. Other reasons are agricultural input purchases, health expenses, ceremonial expenses and purchases of food and durables.

Table 1.6.1 Borrowing Characteristics by Area

	Overall	Jericho	Al 'Auja	Tubas	Area surrounding Tubas	Jordan Valley Villages of Nablus
Borrowing (% except Male vs. Female)						
Never	60	64	65	60	48	63
Seldom	11	6	11	11	18	10
Sometimes	21	24	21	20	17	25
Often	5	4	2	3	13	1
Very Often	3	2	2	6	3	1
M vs. F	F>M	F>M	F>M	M>F	-	-
Average Household Debt and Conditions (% except amount in NIS)						
Debt Amount	18,212	25,413	14,705	19,871	13,161	13,161
Income	28,491	35,433	31,938	23,929	22,785	28,181
Debt/Income	64	72	46	83	58	47
Exp./Income	97	113	100	97	95	75
Interest	3.74	7.14	2.38	1.95	13.48	5.21
Source of Borrowing (%)						
Relative/Friend	64	43	68	75	64	66
Private Bank	16	29	16	10	14	14
Micro-credit	8	6	8	5	12	6
Gov. Bank	-	9	3	8	6	6
Middlemen	4	3	5	3	4	3
Main Reason for Borrowing (%)						
House	26	43	29	-	-	-
Education	20	17	13	35	20	11
Daily Goods	20	14	11	23	28	20
Agricultural Inputs	8	6	21	-	-	11
Health	8	9	3	13	4	11
Ceremony	6	6	8	8	4	11
Food	6	-	8	5	4	14
Durable Goods	5	3	8	5	6	9

Source: Socioeconomic survey, JICA Study Team (See Appendix)

ANNEX 2: EXISTING CONDITION OF WATER RESOURCES

1. Existing Water Resources

(1) Groundwater

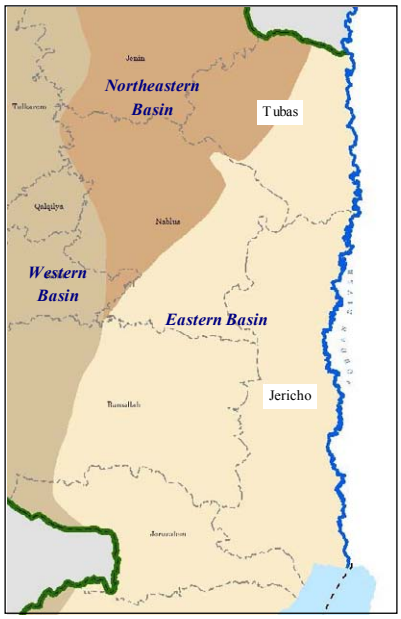
The major water resource in the West Bank is groundwater (wells and springs). In the West Bank, there are three main aquifer basins: the Western Basin, Northeastern Basin and the Eastern Basin.

As shown in Figure 2.1.1, Jordan Rift Valley is located mainly in the Eastern Basin and partly in the Northeastern Basin. The Eastern Basin has two types of aquifers: the mountain aquifer and the alluvial aquifer. The mountain aquifer extends to the west of the basin in the Jordan Rift Valley, and the alluvial aquifer extends along the Jordan River at a lower elevation.

Groundwater is extracted through wells or discharges through springs. The areas with high potential groundwater are located along the major wadis. The existing wells are concentrated along Wadi Far'a and Wadi Qilt as shown in Figure 2.1.2.

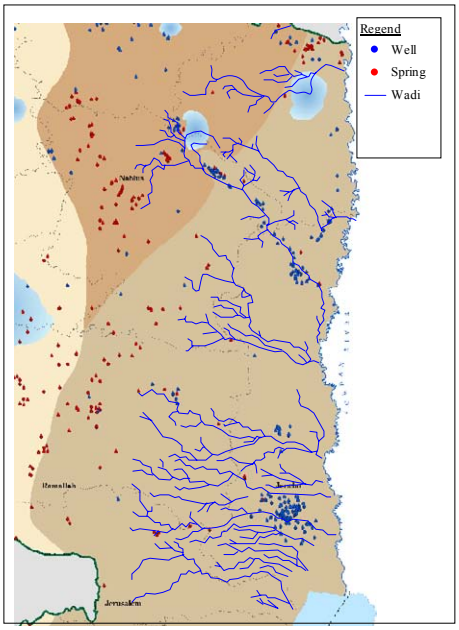
Meanwhile, springs are also located near major wadis. From a topographical point of view, the springs are located along the foot of the mountain area with elevation ranging from -100 m to 200 m. In other words, the springs are located along the boundary between the mountain aquifer and the alluvial aquifer. It is expected that the groundwater naturally discharges from the mountain aquifer and forms the springs.

Figure 2.1.3 shows the composition of the existing water resources in the West Bank and Jordan Rift Valley. It is observed that the volumes of springs and wells are almost equivalent in the West Bank area, but in the Jordan Rift Valley, the spring volume is around four times the well volume. Thus, the Jordan Rift Valley has a relatively rich supply of spring water. According to the Palestinian Water Authority (PWA) database and "Water Situation and Immediate Development



Source: MoP

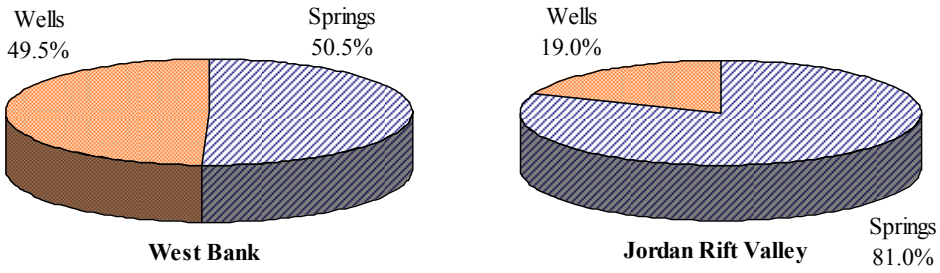
Figure 2.1.1 Groundwater Basin



Source: MoP

Figure 2.1.2 Wells and Springs

Plan in Jericho and Jordan Valley" issued by the PWA in 2005, the total number of springs is 19 and the total volume of annual discharge is 41.58 MCM (or 37.5 MCM according to the report in 2005).



Source: Water Supply for Domestic and Industrial Use (PWA, 2003), PWA Database

Figure 2.1.3 Existing Water Resources in the Study Area

Spring Water Flowing in Wadi Al 'Auja

Spring Water Flowing in Wadi Al Far'a

There are 190 Palestinian wells in the Jordan Rift Valley, of which 88 wells are in operation, 49 wells are abandoned (including three observation wells) and 53 wells are not in operation due to a breakdown of the pumping unit, a decrease in the water level and yield, or a decline in the water quality due to the high brackish level. The total licensed volume of these wells is around 6 MCM/yr. Most non-operated wells are not directly used for drinking due to the brackish water. Some wells have a high brackish level and are usable only for tolerable crops. However, farmers are required to use even brackish water. It is expected that brackish water would be desalinized for domestic use in some regions where water resources are otherwise unavailable.

In addition, there are 25 wells in the Jordan Rift Valley owned by the Israel National Water Company (Mekorot) which are mainly used for Israeli settlements. In some villages, Palestinians purchase the Mekorot water through the West Bank Water Department (WBWD) under the PWA. The total volume available from the Palestinian operated wells is 9.76 MCM/yr, and non-pumped wells have an extraction capacity of 5.94 MCM/yr according to the licensed volume allocated and registered to each well by the PWA.

It is difficult for Palestinians to develop new wells because they are controlled by the Joint Water Committee (JWC) under the Oslo II Accords. Only the wells approved by the JWC can be developed. In the Jordan Rift Valley, there is a well for domestic use in Tammun that has been approved by the JWC. Construction of this well commenced in March 2006.

According to the PWA database, the static water level of some wells in the Jordan Rift Valley has lowered by approximately 6 m to 9 m over the last 20 years due to excessive extraction. Furthermore, an increase in the brackish level has been observed. Approximately 85% of Palestinian wells in the Jordan Rift Valley have a chloride concentration beyond the WHO Guidelines (250 ppm). Therefore, wells with brackish water are used only for agricultural purposes. The following figure shows the licensed volumes of the brackish wells in each locality.

Construction of a New Well in Tammun

Table 2.1.1 Brackish Wells in the Jordan Rift Valley

Locality	Number of Brackish Wells	Cl^- Level (ppm)	Total Licensed Volume (m^3/yr)
Bardala	1	276	238,000
Furush Beit Dajan	1	496	195,000
Az Zubeidat	2	832	369,000
Al 'Auja	4	877	332,000
Al Jiftlik	20	938	4,072,000
Jericho	33	761	4,018,000
Total	61	761	9,224,000

Note: Cl- levels are based on the average of the data for 2000-2003.
The data for some wells, such as non-pumping wells, is missing.
Source: PWA database

About 90% of the total volume of brackish wells are in Jericho and Al Jiftlik. Jericho has plenty of spring water for drinking, but in Al Jiftlik drinking water resources are very few. Therefore, it is necessary to effectively utilize brackish water, even for drinking.

(2) Surface Water

The Jordan River is the sole surface water body permanently flowing in the West Bank. However, it is not available for Palestinians due to Israeli occupation since 1967. In the West Bank, occasionally storm water flowing in wadis during the rainy season may be called surface water. The runoff volume is estimated by the PWA as shown in the following table.

Table 2.1.2 Runoff of Occasional Storm Water

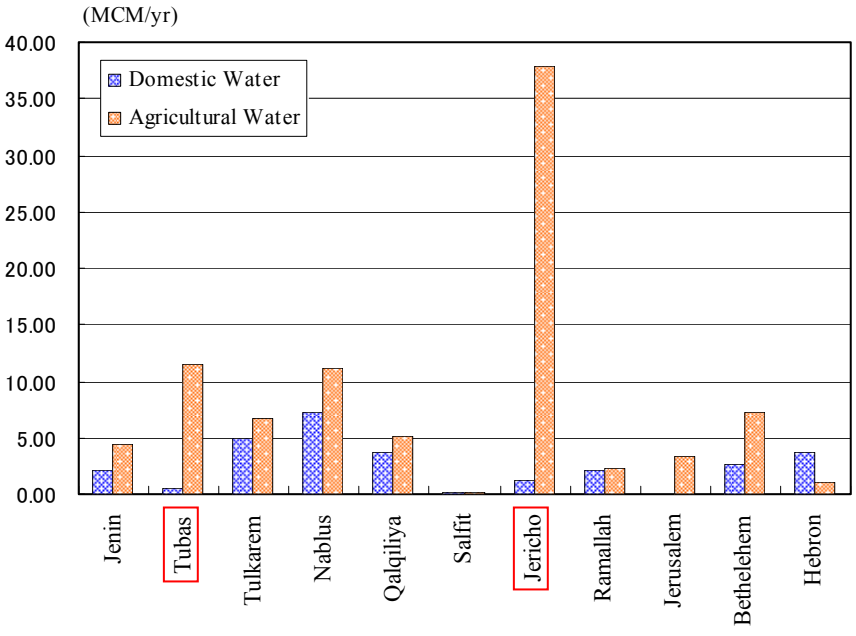
Catchment	Runoff (MCM/yr)		
Maleh	1.0	-	1.0
Nweimeh	1.0		2.0
Far'a	3.5	-	11.0
Ahmar	1.0	-	2.0
Auja	2.0	-	3.0
Qilt	3.0	-	11.0
Total	**11.5**	**-**	**30.0**

Storm Water Flowing in Lower Wadi Qilt

2. Water Consumption

(1) Agricultural Water Consumption

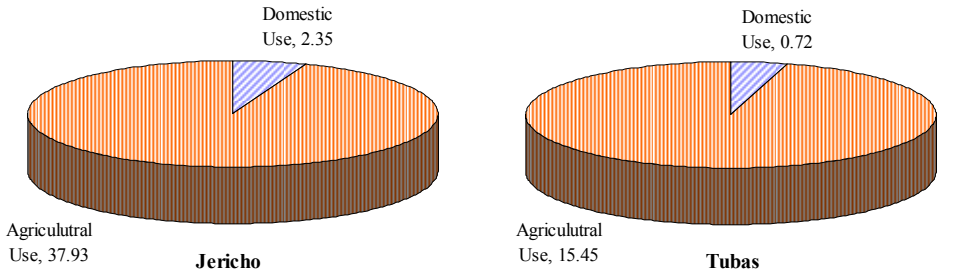
Water resources available for Palestinians are mainly allocated to domestic use (including industries) and agricultural use. Figures 2.2.1 and 2.2.2 show the water allocation in each governorate and in the Jordan Rift Valley, respectively. It is understandable that in the Jordan Rift Valley, particularly in Jericho, water is relatively plentiful. In addition, the average allocation of water to agricultural uses in the West Bank is 76%, however, in the Jordan Rift Valley area, it is as high as 94%.



Source: PWA

Figure 2.2.1 Existing Palestinian Water Resources

Paying attention to the Jordan Rift Valley area, the volumes allocated to domestic and agricultural uses are shown in the following figure.

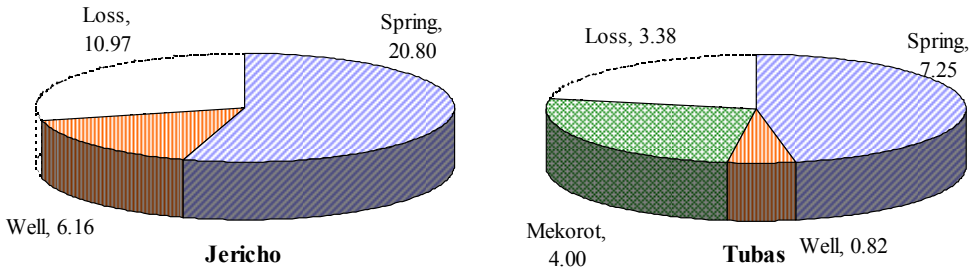


(Unit: MCM/yr)

Source: Water and Wastewater Existing Situation (MoPIC, 1998)
Water Supply for Domestic and Industrial (PWA, 2003)

Figure 2.2.2 Water Distribution for Domestic and Agricultural Use

In reality, water is not consumed up to the available level. According to the data available at PWA, approximately 30% of the available water is lost in the water channels from springs, and in the conveyance systems from wells, the loss is as high as 25%[1]. Most losses are occurred in the conveyance channels, evaporation and illegal uses in the spring channels. Taking into account such losses, the actual consumption for agriculture is estimated as summarized in the following figure.



(Unit: MCM/yr)

Note: Assumed loss in conveyance system from springs is 30%.
Assumed loss in no-network system from wells is 25%.
Losses in the distribution network are not included.
Source: Water Supply for Domestic and Industrial (PWA, 2003)

Figure 2.2.3 Assumed Actual Agricultural Water Consumption

In Tubas, the Mekorot water accounts for 33% of the actual consumption. Due to a shortage of water (even for agriculture), Mekorot water is also purchased in Bardala and its surrounding areas despite the fact that some springs are located near this area.

The following table shows how water is used for agriculture in the Jordan Rift Valley.

[1] Master Planning Framework for Palestinian Water Resource Development; Task 9 (1999, PWA)

Table 2.2.1 Agricultural Practice and Water Consumption

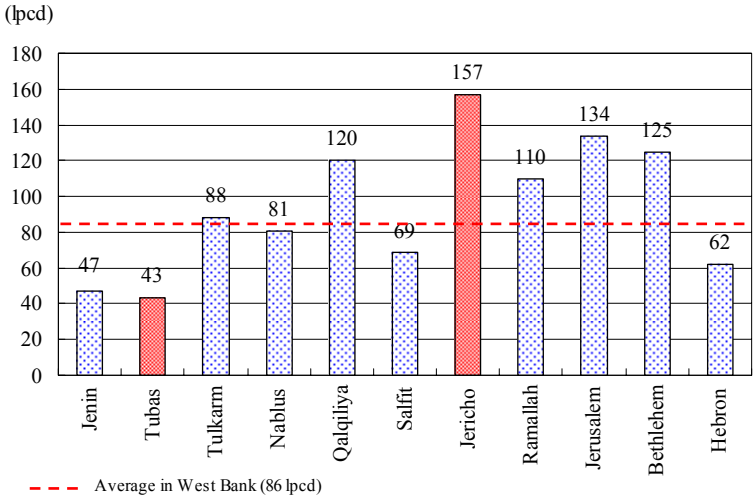
Governorate	Irrigated Area	Production Amount	Water Consumption	Production Efficiency	Water Use Efficiency
	(dunum)	(M. US$)	(MCM/yr)	(US$/dunum)	(m^3/dunum)
Jericho	50,019	38.32	37.93	766	758
Tubas	15,291	36.30	15.45	2,374	1,011
Total	65,310	74.62	53.39	1,143	817

Note: Production amount by rain-fed cultivation is included.
Source: Water Supply for Domestic and Industrial (PWA, 2003)
Agricultural Statistics 2003/2004 (PCBS)

Although Jericho uses more than double the amount of water used by Tubas, the production efficiency is quite low. In Tubas, rain-fed cultivation is the main practice. The total rain-fed cultivation area is approximately 70,000 dunums in Tubas, while it is zero in Jericho. Conversely, the water efficiency in Jericho is higher than Tubas. This means that Jericho is more progressive in agricultural practices than Tubas. It is difficult to reduce the agricultural production levels as agriculture is the mainstay of the Jordan Rift Valley economy. However, the allocation of more water towards domestic use is a prerequisite. Therefore, the improved use of water in agricultural activities is one of the most significant issues for social and economic development in the Jericho and Jordan Rift Valley areas.

(2) Domestic Water Consumption

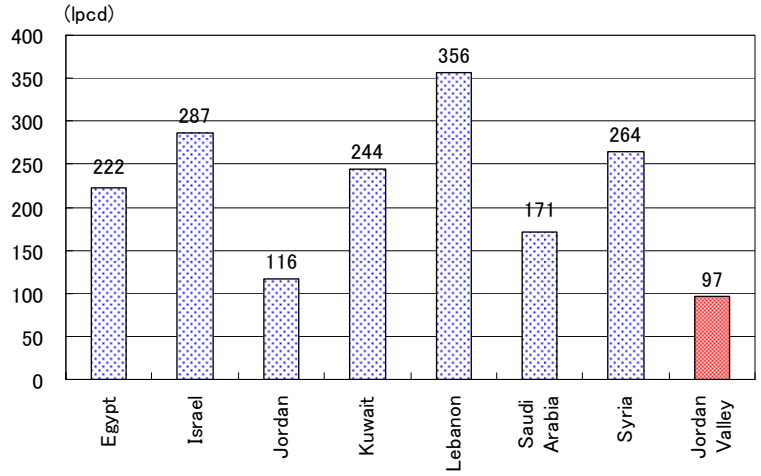
As noted previously, 94% of the water available in the Jordan Rift Valley is used for agriculture, and only 6% or 3.07 MCM/yr (2.35 in Jericho and 0.72 in Tubas) is allocated for domestic use. In addition to this volume, some areas purchase drinking water from the Mekorot, and the total volume of purchases reaches 1.16 MCM/yr. The current water supply situation in the Jordan Rift Valley areas is compared against the other governorates in the West Bank in the following figure.



Note: including system loss
Source: Water Supply for Domestic and Industrial (PWA, 2003)

Figure 2.2.4 Domestic Water Consumption per Capita in the West Bank

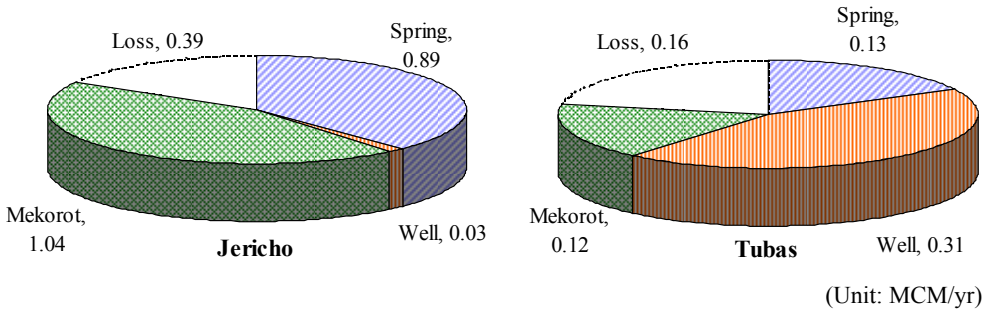
The average water consumption per capita in the West Bank is 86 liter/capita/day (lpcd). Jericho has the highest consumption in the West Bank, while Tubas has the lowest. The average water consumption in the Jordan Rift Valley is 97 lpcd. For reference, the following figure compares domestic water use in the Jordan Rift Valley with the consumption in Middle Eastern countries.



Note: including system loss
Source: World Resource 2005; The Wealth of the Poor (World Resource Institute)

Figure 2.2.5 Domestic Water Production per Capita in the Middle East

Assuming water conveyance losses of 30% and well system losses of 25%[2], the total actual volume reaching the supplied area is estimated to be 2.52 MCM/yr, of which 1.96 MCM is consumed in Jericho and 0.56 MCM in Tubas.



Note: Assumed loss in conveyance system from springs is 30%.
Assumed loss in no-network system from wells is 25%.
Losses in the distribution network are not included.

Figure 2.2.6 Assumed Actual Domestic Water Consumption

The per capita consumption is estimated from the population data in 2003, as shown in the following table and figure.

[2] Source: Master Planning Framework for Palestinian Water Resource Development; Task 9 (1999, PWA)

Table 2.2.2 Water Consumption for Domestic Use

Governorate	Population	Consumption			
		Palestinian Resource	Mekorot Resource	Total	Per Capita
		(MCM/yr)	(MCM/yr)	(MCM/yr)	(lpcd)
Jericho	40,894	0.918	1.042	1.960	131
Tubas	45,187	0.438	0.120	0.558	34
Total	86,081	1.356	1.162	2.518	80

Source: Water Supply for Domestic and Industrial (PWA, 2003)

The current water supply situation in each locality in the Jordan Rift Valley is summarized in more detail in the following table.

Table 2.2.3 Current Water Supply Situation

Locality	Resource	Supply Utility	Population (2003)	Network Coverage (%)	Per Capita (lpcd)
Jericho					
Marj Na'ja	Agri. Well	Association	719	0	55
Az Zubeidat	Agri. Well	Association	1,257	95	163
Marj al Ghazal	Agri. Well	Association	361	0	110
Al Jiftlik	Mekorot	WBWD	4,126	76	71
Fasayil	Mekorot	WBWD	844	60	110
Al 'Auja	Mekorot	WBWD	3,760	67	84
An Nuwei'ma	Mekorot	WBWD	1,092	0	0
'Ein ad Duyuk al Foqa	Spring	Ein Al Duyuk	763	99	82
'Ein ad Duyuk at Tahta	Spring	Ein Al Duyuk	906	99	82
Jericho (Ariha)	Spring	Jericho Municipality	19,140	96	207
'Ein as Sultan Camp	Spring	Jericho Municipality	1,908	61	207
Aqbat Jaber Camp	Mekorot	WBWD	5,947	92	156
Tubas					
Bardala	Mekorot	WBWD	1,481	82	53
'Ein el Beida	Mekorot	WBWD	1,015	86	65
Kardala	Mekorot	WBWD	155	71	65
'Aqqaba	Mekorot	WBWD	5,701	58	3
Tayasir			2,251	0	n.a.
Al Farisiya			200	0	n.a.
Ath Thaghra			243	39	n.a.
Al Malih			194	0	n.a.
Tubas	Well	Tubas Municipality	15,104	84	75
Ras al Far'a			658	0	n.a.
El Far'a Camp	Spring	Al Far'a Camp	5,398	100	91
Wadi al Far'a			2,198	0	n.a.
Tammun			9,803	0	n.a.
Al Hadidiya			172	0	n.a.
Wadi Al Fara' Area					
Talluza	Well	Nablus Municipality	2,466	96	105
Al Badhan	Well	Nablus Municipality	2,228	87	105
An Nassariya	Agri. Well	An Nassariya	1,245	n.a.	n.a.
Al 'Aqrabaniya			824	0	n.a.
'Ein Shibli	Spring	Beit Imreen	182	63	58
Furush Beit Dajan			1,066	n.a.	n.a.

Note: Including water losses
Data for some areas are missing
Source: Water Supply for Domestic and Industrial 2003 (PWA)

3. Water Resource Management

(1) Water Rights

Up until 1994, licenses to drill wells were granted to individuals by the Israeli government during its administration in the West Bank. After 1994, the PNA was established and such licensing was controlled through the PWA. However, the PWA only controlled the water volumes to be extracted from an environmental viewpoint and no additional licensing was enforced under the PNA. Under the Oslo II Accords in 1995, both Palestine and Israel agreed to establish the JWC to serve as an institutional mechanism for the interim period. No additional drilling of wells in the West Bank has been approved by the JWC until the current time.

In this regard, the water rights for most of the wells in the West Bank belong to private owners except for some wells owned by municipalities for domestic use. The utilization, allocation, and distribution of water are based on individual agreements between the well owners and the farmers/land owners. Some springs are also owned by individuals in spite of the huge water supply facilities required in terms of quantities and conveyance systems (for instance, the length of the conveyance channel for the Al Qilt Spring is more than 20 km).

Under such circumstances, the government recommends:

- The formulation of water users' associations for the efficient utilization of water among water users, and
- The creation of reservoirs (water tanks) for storing water in order to share water equitably on a volumetric basis instead of an hourly basis.

In order to cope with this, it is strongly recommended that collective or cooperative ownership and management of wells/springs and conveyance facilities is applied for the sustainable management of the groundwater resources. Such associations will become important in the future if new irrigation projects using well water are initiated by the funds of international donors.

(2) Water Tariffs

In general, water tariffs are not determined for private wells used for agricultural purposes. Instead, private well owners charge farmers for the total service, including the provision of water, fertilizers, cultivation devices, operation and maintenance services, land and marketing support. For instance, a well owner sets 30% on products on farmers having their own land, or 50% on farmers without land. The average tariff is unknown.

Tanker Used to Deliver Water to Households

Private wells that are used for domestic purposes generally set high water tariffs. In most of the water supply systems without conveyance and distribution facilities, water is supplied to households by tankers.

The water tariffs for such systems are high due to the high costs associated with the operation and maintenance, as well as the margin applied for the well owners. For instance, the hearing survey to the LGUs conducted by the Study Team revealed the current situation as shown in the following table.

Table 2.3.1 Domestic Water Supply Management in Tammun and Frush Beit Dajan

Locality	Tammun	Frush Beit Dajan
Water Resource	Private Well	Private Well
Supply System	10m^3 Tanker (Owned by the Municipality)	3m^3 Tanker (Owned by private persons)
Management Body	Municipality	None
Water Tariff for Resident	7 NIS/m^3	20 NIS/m^3
Portion Paid to Well Owner	2.5 NIS/m^3	6.7 NIS/m^3
Remarks	- The portion of the tariff covering the operation and maintenance costs is 4.5 NIS/m^3, but this is not enough. - The deficit in water supply management is around 3,500 NIS/month. - There is a conveyance system from the well to the filling point. - Consumption is assumed to be 20 lpcd.	- The other portion of the tariff (13.3 NIS/m^3) is paid to private tanker owners. - Residents who have their own tankers bear only the portion of the tariff paid to the well owner.

Note: The water tariff levied by Mekorot in other areas is set at 2.6 NIS/m^3.
Source: Interview results, JICA Study Team

In relation to spring sources, water tariffs are quite low compared to the above mentioned tariffs. In the Jordan Rift Valley, the areas where spring water is used for domestic water are in the Jericho Municipality and some of its surrounding area, El Far'a Camp and Ein Shibli. The water tariffs in El Far'a and Ein Shibli are unknown, but the tariff is 0.3 NIS/m^3 in the Jericho Municipality.[3]

4. Wastewater Management

In the West Bank, approximately 65% of the population is not serviced by a sewerage network. These residents use mainly cesspits and occasionally septic tanks. The remaining 35% are connected to a sewerage network, but less than 6% of the total population is serviced by treatment plants. The existing treatment plants in the West Bank are shown in the following table. Most systems are out of service, not functioning, are overloaded or receive poor maintenance. Some other areas not specified in the table, such as East Nablus, Qalqilia and Salfit simply have collection systems that discharge wastewater into wadis without any treatment.

[3] Master Planning Framework for Palestinian Water Resources Development; Task 9 (1999, PWA)

Table 2.4.1 Wastewater Treatment Plants in the West Bank

Governorate	Plant Name	Served Area	System	Const. Year	Capacity (m3/day)	Condition
Jenin	Jenin WWTP	Jenin	Oxidation Ditch	1972	1,000	Not functioning as heavily overloaded
Nablus	Sara WWTP	Sara	Primary & secondary treatment	1999	50	Not operating
Tulkarem	Tulkarem WWTP	Tulkarem, Tulkarem Camp, Nur Shams Camp, and so on	Lagoon	1975	600	Poor design, inadequate maintenance, overloaded
Ramallah	Al Bireh WWTP	Al-Bireh, Al Am'ari Camp, Qaddura Camp	Activated Sludge	2000	3,600	Operating well
	Ramallah WWTP	Ramallah	Oxidation Ditch	1975	1,300	Not functioning well
Hebron	Hebron WWTP	Hebron	Activated Sludge	1988	6,700	Not functioning
	Deir Samit WWTP	Deir Samit	Primary treatment	2002	15	Operating well

In the Jordan Rift Valley, there is no public wastewater treatment system. Domestic wastewater is collected mainly in cesspits. In some areas, black wastewater is collected in cesspits, while grey wastewater is discharged into open ditches. Only some industries or private companies have small-scale treatment systems. The main type of toilets are pit latrines, although flush toilets are used in the urban areas such as Jericho and Tubas Municipality. According to the socioeconomic survey conducted by the JICA Study Team, 56% of the residents use pit latrines or flush toilets.

5. Studies on the Current Situation

(1) Analysis of Water Quantity and Quality

(i) Water Quantity

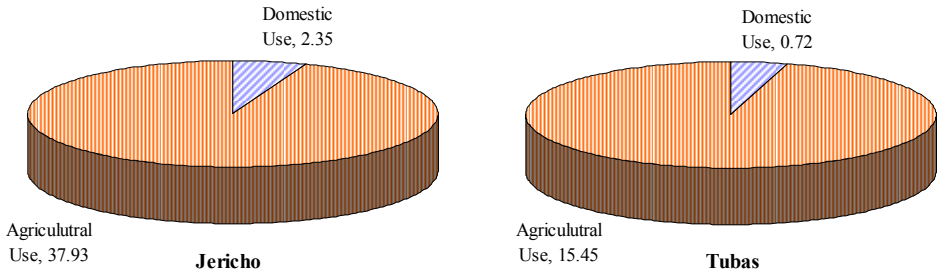
Issues to be addressed in relation to the quantity of water in the Jordan Rift Valley are summarized below:

- There is a shortage of domestic water because the water used for agricultural purposes represents a large portion of the existing water resources.
- The volume of water in the aquifers is declining due to excessive exploitation.

The details of each issue are explained as follows.

Shortage of Domestic Water

As shown in the following figure, nearly 95% of water available in the Jordan Rift Valley is allocated to agricultural purposes.



(Unit: MCM/yr)

Source: Water and Wastewater Existing Situation (MoPIC, 1998)
Water Supply for Domestic and Industrial (PWA, 2003)

Figure 2.5.1 Water Distribution for Domestic and Agricultural Use

Conversely, 5% of the water resources are allocated to domestic use. Taking into account water losses, the water volume available for domestic use does not meet the target water demand which is 150 lpcd based on the WHO Standards.

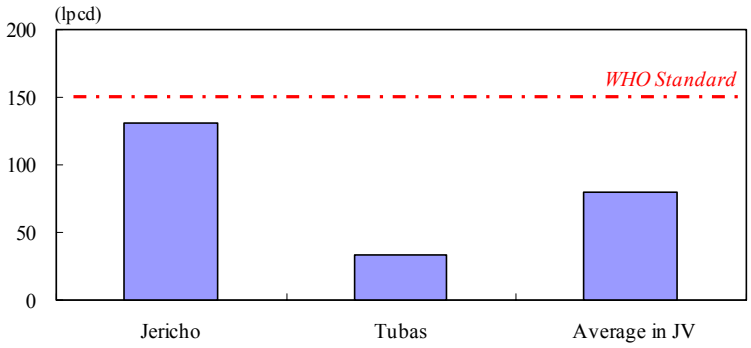


Figure 2.5.2 Domestic Water Consumption per Capita

The following figure shows how water is used for agricultural activities in the Jordan Rift Valley.

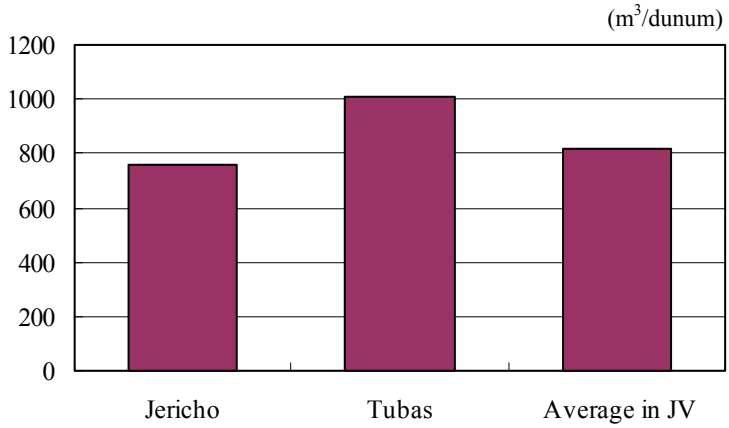


Figure 2.5.3 Production and Water Efficiency of Agricultural Activities

The water efficiency in Jericho is higher than Tubas. This indicates that Jericho is more progressive in agricultural practices than Tubas. It is impossible to reduce the level of agricultural production because agriculture is the main economic activity in the Jordan Rift Valley. However, in order to allocate more water to domestic uses, the use of water in agricultural activities must be improved through the establishment and implementation of methods for reducing water consumption while retaining or increasing agricultural production.

A significant amount of spring water is lost prior to being used mainly due to leakage, evaporation and illegal extraction. The volume lost is estimated to be 30% of spring water, which accounts for 80% of the water available in the Jordan Rift Valley area. This water is lost in the conveyance channels which have a length of around 10 to 30 km. As a result, only 1.36 MCM/yr (0.92 MCM/yr in Jericho and 0.44 MCM/yr in Tubas) reaches the supply areas, although the volume available for domestic use is estimated to be around 3 MCM/yr. If all of this lost water could be allocated to domestic use, the volume would be equivalent to supplying around 250,000 people with water based on the estimated consumption of 150 lpcd. Improvement of the spring water channel systems is urgently required.

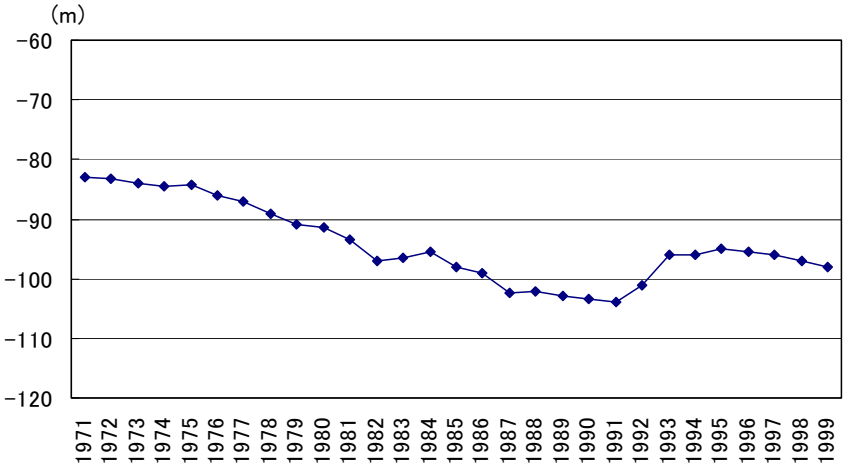
Water Leakage from a Channel (Al 'Auja Spring)

Furthermore, there are untapped water resources, due to the 53 wells that are out of operation. The total licensed volume of these wells is around 6 MCM/yr. Most of these wells are not directly used for drinking water due to the brackish water. Some of wells have such a high brackish level that they are only suitable for tolerant crops. However, farmers are required to effectively use even the brackish water. It is also considered that brackish water will be desalinized for domestic use in some regions where there are few water resources.

Non-operational Pumping Unit (Frush Beit Dajan)

Declining Aquifers

According to the PWA database, the static water level in the wells in the Jordan Rift Valley area have declined by approximately 6 m to 9 m over the past 20 years. For example, the static water level of a well in Furush Biet Dajan (No. 19-17/50) over the past 30 years is illustrated in the following figure.



Source: PWA database (2003)

Figure 2.5.4 Static Water Level of the 19-17/47 Well in Furush Biet Dajan

The water level has dropped approximately 15 m in 30 years. The groundwater resource is considered to be a renewable resource as is evident in the dramatic recovery of the static water level from 1993 to 1995 owing to an abundant rainfall in the catchment area. However, it is assumed that the volume being extracted from both Palestinian and Mekorot wells exceeds the sustainable volume. Each well is officially allocated a license which specifies the limit of the extractable volume. However, some wells are illegally used beyond the licensed volume. According to the data for 2003, the exceeded volume was approximately 1.8 MCM/yr. The

volumes being extracted need to be strictly monitored and controlled in compliance with the licenses which should be evaluated according to the feasible volume and annual precipitation levels.

(ii) Water Quality

With regard to water quality, the following issued are to be addressed:

- The brackish level of the wells is increasing in alluvial aquifers.
- Spring water is being contaminated mainly due to wastewater discharges.

Increasing Brackish Level

An increase in brackish level is related to a decrease in the static water level due to the excessive extraction mentioned above. Brackish wells, in which the Cl^- level exceeds the WHO Standard (250 ppm), are used only for agricultural purposes. The following figure shows the licensed volumes of the brackish wells in each locality.

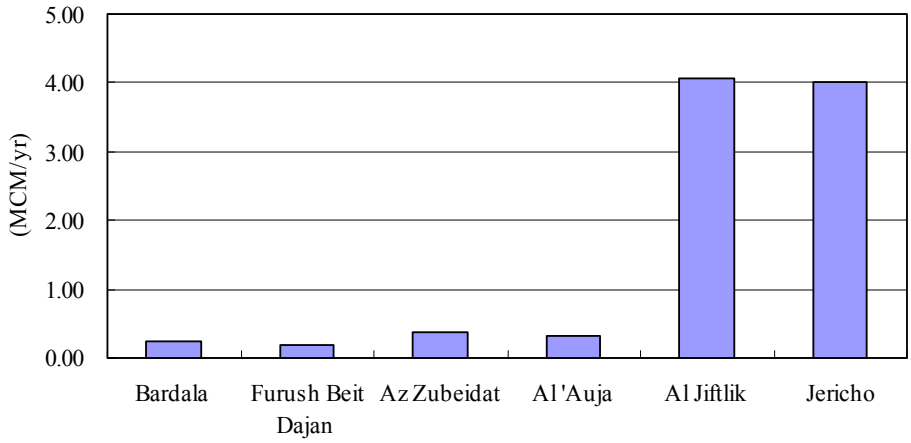
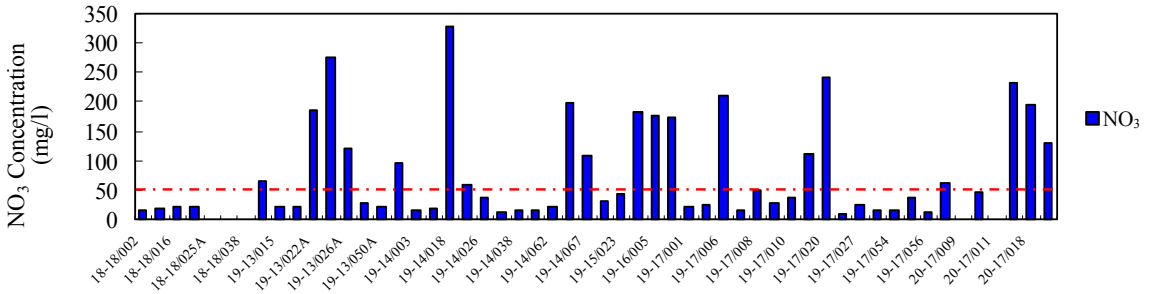


Figure 2.5.5 Volume of Brackish Water Extracted from Wells

Ninety percent of the total volume of brackish wells is extracted in Jericho and Al Jiftlik. Jericho has plenty of spring water for drinking, but in Al Jiftlik water resources for drinking are very few. It is necessary to use brackish water effectively, even for drinking.

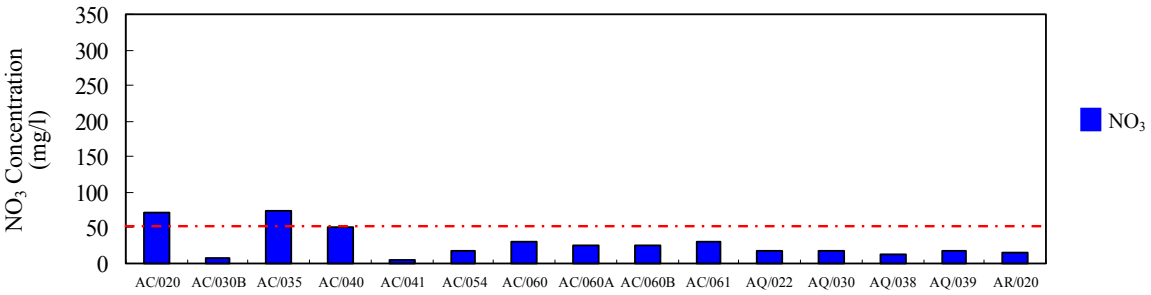
Contamination of Water Resources

Water resources have been contaminated by wastewater discharges. This fact is one of the causes of the shortage of drinking water. Figures 2.5.6 and 2.5.7 show the NO_3 levels in wells and springs respectively.



Note: NO_3 standard for drinking water is 50 ppm.
Source: PWA database (2005)

Figure 2.5.6 NO_3 Level in Wells



Note: NO_3 standard for drinking water is 50 ppm.
Source: PWA database (2005)

Figure 2.5.7 NO_3 Level in Springs

It is observed that wells in Jericho, Al Jiftlik, Marj Naja and Ras Al Far'a are particularly contaminated. This means that the Wadi Al Qilt and Wadi Al Far'a basins are affected by wastewater discharges. As for springs, the NO_3 levels in the Al Malih springs in the Wadi Al Malih basin exceeded the WHO standard.

(2) Institutional Analysis

In addition to the items mentioned above, the issues relating to the management of water resources are summarized as follows.

- Most wells and some spring water facilities are privately owned.
- Water tariffs vary considerably depending on the water resource.
- There are no rules and regulations for the governance of water resources.

Private Ownership

Most wells and conveyance systems are privately owned. Therefore, the utilization, allocation and distribution of water resources are dependent on each private owner. Some springs including their conveyance facilities are also privately owned. The PNA does not maintain any exact data on the existing condition of these facilities, except for some data on discharge

volumes and water quality. Furthermore, unclear water rights have prevented implementation of any strategic development and improvement of water resource management.

Water Tariffs

The water tariffs charged by the private wells (such as Tammun and Frush Beit Dajan) to domestic users are generally high. Most private wells have no conveyance or distribution facilities. The water tariffs for such systems are very expensive due of the high operation and maintenance costs and the margin added for the well owner. For spring sources such as Jericho, water tariffs are quite low compared to the above mentioned tariffs. Thus, the water tariffs in the Jordan Rift Valley area are quite variable depending on the characteristics of the area, the management bodies and the water resources, as illustrated in the following figure.

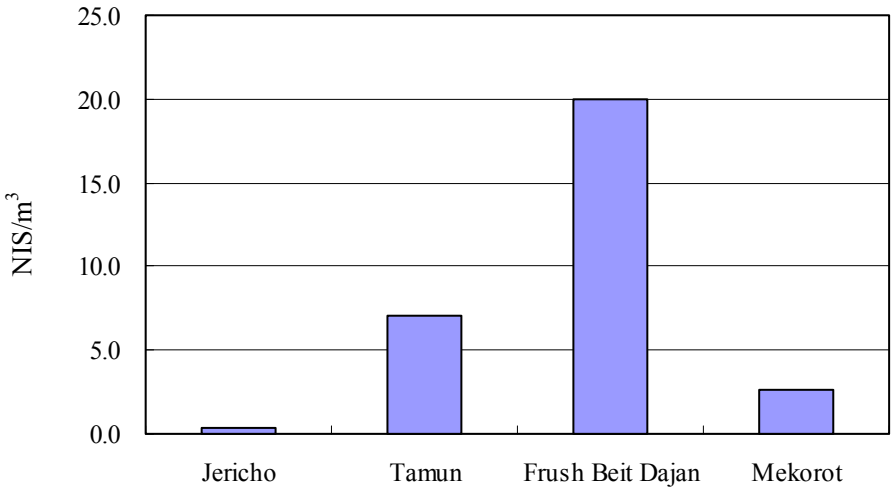


Figure 2.5.8 NO_3 Level of Springs

This issue has generated economic differentials in the living conditions of the residents. The supply of high quality water at more reasonable prices should be taken into consideration through the optimization of the allocation of water resources and the enhancement of the water supply facilities and their management.

No Rules or Regulations for the Governance of Water Resources

The issues mentioned above are related to the weak governance of the water resources by the PNA. Currently, there are no precise or concrete rules or regulations on water resource management and environmental management. Some draft rules and regulations have been prepared, but they have not been finalized and are not yet valid. In particular, it is very important to establish a regulation on water rights.

ANNEX 3: CURRENT AGRICULTURAL CONDITIONS

1. Land and Water in the Jordan Rift Valley Area

(1) Cultivable Land and Production

As noted in the Sub-section 8.1.1 of the Main Report, the agricultural or cultivated land in the Study Area (Jericho and Tubas in the Jordan Rift Valley) is limited to around 135,000 dunums or 14% of the total area (approximately 1,000,000 dunums). The ratio of agricultural land is much smaller than that in the West Bank. Nearly half of the cultivated land is irrigated, mainly in Jericho.

According to the available data of the Palestine Central Bureau of Statistics (PCBS), agricultural production in the West Bank amounted to approximately US$ 570 million in 2000/2001. Crop production accounted for 48% of this total production (US$ 276 million) and livestock production 52% (US$ 294 million), as shown in the following table. Production in Jericho and Tubas amounted to about US$ 89 million or 16% of the total production in the West Bank.

Table 3.1.1 Agricultural Production in the West Bank (2000/2001)

(Unit: US$ 1,000)

District / Governorate	Crop Production	Livestock Production	Total
West Bank and Gaza	431,072	370,529	801,601
West Bank	276,160	294,469	570,629
Jericho	33,510	13,231	46,741
Tubas	27,702	14,432	42,134
Jenin	48,994	38,947	87,941
Tulkarem	42,785	22,810	65,595
Nablus	20,798	31,636	52,434
Qalqilia	23,919	14,148	38,067
Salfit	3,765	5,798	9,563
Ramallah and Al-Bireh	11,683	35,388	47,071
Jerusalem	2,823	13,523	16,346
Bethlehem	14,991	20,899	35,890
Hebron	45,190	83,657	128,847
Gaza Strip	154,912	76,060	230,972

Source: Agricultural Statistics, PCBS

(2) Irrigated Land and Irrigation Efficiency

As discussed in Chapter 2 of Annex 2, water resources in the Jordan Rift Valley area are quite scarce. This is due to the natural conditions as well as the abnormal conditions created by the Israeli control over the Palestinian water resources which prevents Palestinians from extracting the water needed for agriculture.

With the limited water available for irrigation, efficient irrigation practices are vital for agricultural development in the Jordan Rift Valley area. Irrigation efficiency can be expressed as a ratio between the total quantity of irrigation water delivered and the quantity of water effectively used by crops. Water losses can occur in the form of seepage from irrigation network channels, non-uniform distribution of the network over the field, percolation below the crop root zone and evaporation from the spray and plant leaves in the case of sprinkler irrigation. The degree of these losses can be estimated through various types of efficiency measurements; water conveyance efficiency, field canal efficiency and water application efficiency.

(i) Water conveyance efficiency

This is the ratio between the water delivered to a block of fields and the water diverted from the source. Conveyance systems may vary depending on the source of water (wells or springs). The conveyance efficiency in piped systems from wells has been measured in some irrigation schemes and is around 90%[1]. Whereas, open water conveyance systems from springs to farms (often several kilometers downstream) are comprised of earthen or lined open canals and earthen buffer pools (usually plastic lined). Unlined ditches and incomplete/defective conveyance facilities are popular in the Jordan Rift Valley because of their low capital cost and easy construction. In the Jordan Rift Valley, 16% of farmers deliver water, especially spring water (from the Wadi al Qilt, Wadi al 'Auja and Wadi al Far'a), to their farms through open earthen or incomplete/defective concrete channels.

The low conveyance efficiency in the Jordan Rift Valley area is due to the dependence on springs as the major source of water. Spring discharges have a high variability and a large amount of spring water is lost every year due to the lack of storage facilities, especially during winter months when the demand is lower. Water is distributed by open earth and concrete canals, thus a large amount is lost through seepage and evaporation. These losses are estimated to be about 30% of the total water discharge.

Construction of a closed pipe system will not only eliminate water losses through seepage and evaporation but also deliver water under pressure within most of the irrigation command area, enabling the installation of drip irrigation systems without additional and expensive pumping.

(ii) Field application efficiency

Field efficiency is defined as the part of the applied water that is used beneficially by the plants. However, field efficiency varies largely depending on the type of irrigation techniques in use and performance of the irrigation network. With regard to consumptive and non-consumptive water terms, it is worth mentioning that all irrigation water used in the West Bank and Gaza can be considered to be the consumptive type, as no drainage water exists. Many methods of water

[1] I. Nifal, Water management in small groundwater irrigation schemes in Palestine, 1998.

application are used in the large irrigation systems, however there are three basic methods; surface irrigation, sprinkler irrigation, and drip irrigation.

The results of a study conducted on irrigation by the World Bank in 1995 indicated that the application efficiency of irrigation water is relatively high (F. Al-Juneidi and J. Issac; ARIJ). However, this is not due to good management, but mainly due to the shortage of water in the irrigated areas. Of the area currently irrigated in the Jordan Rift Valley, about 97% of vegetables are irrigated by drip systems having an application efficiency of 78%, and 2.4% by sprinklers with an application efficiency of 85%. These field application efficiencies may be acceptable in many other countries, but given the severe scarcity of water and the high population growth and increased demand for water in the area, more efficient systems are desirable.

The field application efficiency can be improved by introducing modern irrigation technologies and encouraging water user organizations. Although local water markets are quite common in most areas, water transactions have been based on hourly charges rater than volumetric charges, which further hinders the optimal allocation and utilization of irrigation water. Further improvements in the economic efficiency of irrigation water can be achieved through the promotion of local water markets, the enhancement of their efficiency, and the introduction of water charges based on volumetric usage.

(3) Current Water Balance

There is a consensus that a significant amount of water could be saved through the rehabilitation or replacement of water infrastructure (e.g. springs and ponds). It is commonly recognized that the conveyance efficiency could be raised to 95% by delivering water through a closed pipe system. By applying this conveyance efficiency (95%) instead of the present efficiency of 70% (30% loss) and the same application efficiency of 75%, the following estimate is calculated.

Table 3.1.2 Total Agricultural Water Demand in Relation to the Availability of Water for Agriculture

District/Governorate	Total Area (Dunum)	Actual Water Use (MCM)	Optimum Water Use (MCM)		Water Deficit/ Surplus (MCM)	
			Without LR	With LR	Without LR	With LR
Tubas	15,291	9.14	6.97	7.85	2.17	1.29
Jericho	50,019	29.89	28.41	31.47	1.48	-1.58
Jordan Rift Valley Area	**65,310**	**39.03**	**35.38**	**39.32**	**3.65**	**-0.29**

Note: LR: Leaching Requirements

As seen in the above table, even after the replacement of the present canals with pipelines and regulation ponds, it is not possible to increase the irrigation area in Jericho Governorate, unless the application efficiency is raised through the adoption of modern irrigation systems and techniques. However, in the Tubas District, the surplus water will be 1.29 MCM/year.

The optimal water use, based on the assumed cropping patterns, will be discussed further in the subsequent section.

2. Crops and Farming

Crops in the West Bank and the Jordan Rift Valley area are classified into (i) field crops and forages, (ii) vegetables, and (iii) fruit.

(1) Field Crops

The major field crops and forages currently cultivated in the Jordan Rift Valley area are wheat, barley, clover, dry onion, and potatoes under rain-fed conditions in Tubas District, and wheat, chick-peas, clover, sem, dry onion, garlic, barley and local tobacco under irrigated conditions in Jericho Governorate. The cropped area, yield and production in 2003/04 are shown in the following table.

Table 3.2.1 Field Crop Production in Jericho Governorate and Tubas District (2003/2004)

	Jericho			Tubas		
Crops	Area*1 (dunum)	Yield (t/dunum	Prod. (ton)	Area*2 (dunum)	Yield (t/dunum	Prod. (ton)
1 Wheat	3,980	0.25	995	36,600	0.250	9,150
2 Barley	1,180	0.25	295	450	0.275	124
3 Clover	820	1.50	1,230	3,900	0.500	1,950
4 Dry Onion	355	4.00	1,420	850	2.000	1,700
5 Potato	113	4.00	452			
6 Chick-peas				4,200	0.250	1,050
7 Sem				2,800	0.550	1,540
8 Local Tobacco				700	0.110	77
9 Broad bean				400	0.125	50
10 Anise				360	0.170	61
11 Sesame				200	0.075	15
12 Lentil				100	0.110	11

Source:Agricultural Statuistics, PCBS
*1: under irrigation condition, *2: under rainfed condition

As shown in the above table, wheat production in the Study area was 10,145 tons in 2003/04, and accounted for 26% of the total production in the West Bank or 22% of the total Palestinian production. Despite the fact that it is cultivated in the highlands where the annual rainfall ranges from 350 mm to 450 mm, the yield was 200 to 250 kg per dunum (2.0 to 2.5 tons per ha).

A comparison between the production of major field crops in 1999/2000 and 2003/04 in the West Bank demonstrates some trends in the cultivation of field crops as shown in the following two tables. The production of potatoes has decreased drastically, while the production of wheat and barley has been maintained more or less at the same level. This comparison also indicates that, while the Palestinian

population has increased by 16% during this period, the per capital field crop production has reduced by more than 20%.

Table 3.2.2 Major Field Crop Production in Jericho Governorate and Tubas District (1999/2000)

(Unit: ton)

District	Wheat	Potato	Barley	Chick-Peas	Broad Bean
Tubas	7,422	4,300	177	20	63
Jericho	1,223	45	130	-	-
West Bank	44,685	12,684	13,257	2,288	445

Source: Agricultural Statistics, PCBS 2002

Table 3.2.3 Major Field Crop Production in Jericho Governorate and Tubas District (2003/2004)

(Unit: ton)

District	Wheat	Potato	Barley	Chick-Peas	Broad Bean
Tubas	9,150	-	124	1,050	50
Jericho	995	452	295	-	-
West Bank	38,538	5,118	13,548	2,829	455

Source: Agricultural Statistics, PCBS 2005

It is also noted that self-sufficiency of the population in basic staples (wheat/cereals) is estimated to be as low as 12%, based on the assumption that the annual average cereal consumption is presumed to be 105 kg/person/year (1996/1998 average).

(2) Vegetables

(i) Area and production

Vegetable cultivation is widely disseminated in the West Bank. Out of the irrigated area of 131,430 dunums in the West Bank in the 2003/04 crop season, 94,320 dunums (about 72%) contained vegetable crops. Jericho is the center of vegetable production in the Jordan Rift Valley, with an irrigated vegetable area of 36,200 dunums. Tubas District also cultivates vegetables over a total land area of about 19,460 dunums (of which 14,250 dunums are irrigated). Around 22 types vegetables are cultivated in Jericho Governorate and Tubas Districts. The major vegetables and their production are: eggplants (28,970 tons or 76% of production in the West Bank), tomatoes (27,390 tons or 34%), cucumbers (26,160 tons or 30%), and squash (23,990 tons or 69%). Unlike field crops, no clear trend has been observed in vegetable production in the West Bank before and after the Second Intifada. The following table shows the cropped area, yield and production of vegetables in the Jordan Rift Valley area.

Table 3.2.4 Vegetable Production in Jericho Governorate (2003/2004)

Crops	Area (dunums)				Yield (ton/dunums)		Production (ton)			Total
	Irrigation		Rainfed	Total	Irrigation	Rainfed	Irrigation		Rainfed	Production
	Covered	Open					Covered	Open		(ton)
1 Squash	2,501	6,005		8,506	2.00		5,002	12,010		17,012
2 Maize	0	5,597		5,597	1.00		0	5,597		5,597
3 Eggplant	0	4,563		4,563	5.00		0	22,815		22,815
4 Tomato	460	3,987		4,447	3.5-18.00		3,104	13,955		17,058
5 Cucumber	508	2,060		2,568	2.00-5.35		2,718	4,120		6,838
6 Kidney bean (green)	175	1,962		2,137	0.60-1.50		263	1,177		1,440
7 Broad bean (green)	0	1,983		1,983	0.40		0	793		793
8 Jew's mallow	43	1,400		1,443	3.00		129	4,200		4,329
9 Cauliflower	0	1,265		1,265	1.00		0	1,265		1,265
10 Paprika	68	647		715	1.00-1.50		88	647		735
11 Hot Pepper	49	627		676	1.00-1.50		58	627		685
12 White Cabbage	0	610		610	2.00		0	1,220		1,220
13 Snake cucumber	0	554		554	1.00		0	554		554
14 Okra	495			495	0.50		248	0		248
15 Pumpkin	0	405		405	0.50		0	203		203
16 Kidney bean (yellow	0	140		140	0.60		0	84		84
17 Water Melon	0	100		100	3.00		0	300		300

Source: Agricultural Statistics, PCBS

Table 3.2.5 Vegetable Production in Tubas District (2003/2004)

Crops	Area (dunums)				Yield (ton/dunums)		Production (ton)			Total
	Irrigation		Rainfed	Total	Irrigation	Rainfed	Irrigation		Rainfed	Production
	Coved	Open				Rainfed	Covered	Open		(ton)
1 Cucumber	2,265	1,880		4,145	2.66-7.13		14,319	5,001	0	19,320
2 Squash	1,320	2,120	300	3,740	1.80-1.90	1.90	2,376	4,028	570	6,974
3 Chick-peas (green)	0		3,050	3,050		0.90	0	0	2,745	2,745
4 Tomato	271	1,080	10	1,361	5.00-18.0(	1.50	3,838	6,480	15	10,333
5 Maize	350	920		1,270	1.50		525	1,380	0	1,905
6 Broad bean (green)	0	750	400	1,150	1.45	0.20	0	1,088	80	1,168
7 Eggplant	220	870		1,090	4.25-6.00		935	5,220	0	6,155
8 Peas	0		1,000	1,000		0.85	0	0	850	850
9 Hot Pepper	147	355		502	1.40-3.00		252	550	0	802
10 Kidney bean (green)	141	315		456	0.80-1.00		195	315	0	510
11 Muskmelon	120	210	100	430	4.00-5.50	0.90	480	1,155	90	1,725
12 Snake cucumber	0	280	100	380	1.00	1.50	0	280	150	430
13 Cauliflower	0	320		320	0.27		0	86	0	86
14 Okra	0		250	250		0.20	0	0	50	50
15 Paprika	0	135		135	1.60		0	216	0	216
16 Kidney bean (yellow	0	105		105	0.85		0	89	0	89

Source: Agricultural Statistics, PCBS

(ii) Farming system

The vegetable farming system is classified into four categories; (i) irrigated open fields (outdoors), (ii) low plastic tunnels, (iii) high plastic tunnels, and (iv) plastic houses. Due to the limited rainfall, the majority of vegetable cultivation is carried out under irrigation. In Jericho, plastic houses and high tunnels cover and area of 890 dunums for the cultivation of tomatoes, cucumbers, kidney beans, jew's mallow, paprika and hot pepper. Low plastic tunnels apply over an area of 3,410 dunums mainly for the cultivation of squash. Modern irrigation technologies (drip and sprinkler irrigation) are adapted for most of the vegetable cultivation.

(iii) Crop season

The crop season in a normal year commences in September and continues up until May/June. Only preparatory work for the next season is done during the hot summer. The planting season is classified into; (i) winter cropping from September to January, and (ii) summer cropping from February to March/April. Depending on the variety of vegetables, short cycle vegetables (e.g. leaf vegetables) are planted several times a season. The following table shows a typical crop season in the Jordan Rift Valley area.

Table 3.2.6 Cropping Calendar in Jericho Governorate (Unit: mm)

Crops	Planting	1	2	3	4	5	6	7	8	9	10	11	12
1 Squash1	Sep.									97	130	97	22
2 Squash 2	Nov.	65	36									44	54
3 Eggplants	Sep.	72	95	151	224	249				90	96	101	70
4 Tomatoes	Sep.	72	86							90	100	104	70
5 Cucumbers 1	Oct.	40									68	83	63
6 Cucumbers 2	Nov.	65	84	35								42	47
7 Beans	Oct.										63	92	32
8 Broadbeans	Nov.	65	25									34	53
9 Corn 1	Oct.	69									54	89	70
10 Corn 2	Dec.	61	95	144									23
11 Corn 3	Mar.			50	191	278	88						
12 Jews' mallows	Feb.		45	131	200								

Source: Water Resources and Irrigation Agriculture in the West Bank
Note: Figers show the water requirement.

Eggplant (Open Culture)

Green house

(3) Fruit Trees

Fruit trees are planted over 22,000 dunums in the Jordan Rift Valley area. The irrigated area for fruit cultivation is 7,210 dunums in Jericho Governorate and 820 dunums in Tubas District, totaling 8,030 dunums or 36.5% of the cultivated areas. The total fruit production in Jericho Governorate was estimated to be around 13,900 tons in 2003/04. The area, yield, and production of fruit are tabulated below.

Table 3.2.7 Major Fruit Production in Jericho Governorate and Tubas District (2003/2004)

Crops	Irrigated			Rainfed			Total	
	Area (dunum)	Yield (t/dunum)	Prod. (ton)	Area (dunum)	Yield (t/dunum)	Prod. (ton)	Area (dunum)	Prod. (ton)
Jericho								
1 Olives	60	0.3	18				60	18
2 Grapes	567	2.0	1,134				567	1,134
3 Lemon	321	3.0	963				321	963
4 Banana	2,287	4.0	9,148				2,287	9,148
5 Shammoty Orange	220	3.0	660				220	660
6 Fig	35	1.5	53				35	53
7 Clement	36	1.5	54				36	54
8 Navel Orange	23	3.0	69				23	69
9 Dates	1,115	1.5	1,673				1,115	1,673
Tubas								
1 Olives	200	0.35	70	12,158	0.13	1580.5	12,359	1,651
2 Valencia Orange	39	2.5	98				41	98
3 Lemon	61	1.9	116				64	116
4 Shammoty Orange	138	2.0	276				142	276
5 Fig				35	0.155	5.4	40	5
6 Clement	87	1.6	139				93	139
7 Navel Orange	91	2.7	246				98	246
8 Almond (hard)				231	0.06	13.9	239	14
9 Poppy	30	2.5	75				39	75
10 Almond (soft)				308	0.05	15.4	318	15
11 Mandarin	42	1.0	42				53	42

Source: Agricultural Statistics, PCBS

Banana

Date Palm

Banana cultivation is dominant in Jericho Governorate, accounting for 47% of the area cultivated for fruit and 66% of the fruit production. The climatic conditions in Jericho governorate are suitable for banana cultivation, although they require a relatively large quantity of water and are sensitive to salinity. Attractive prices, protected by the 150% Israeli import tariff, make banana cultivation more profitable. The net return is estimated to be around NIS 2,990 per dunum.

Date cultivation has increased in recent years, and is now the second largest product by cultivation area (1,115 dunums). Since the market demand is high for dates, it is one of the most important fruits in the Jordan Rift Valley.

Citrus is also planted widely in Jericho governorate, with a total cultivated area of 650 dunums for eight varieties of citrus. Its cultivation and production, however, have been decreasing due to three main reasons; (i) a decrease in profitability, (ii) severe competition in the markets, and (iii) salinization of irrigation water. For reference, in 1992, citrus production consumed half of the irrigation water but added only 7% to the total value-added.

Olives occupy the largest rain-fed area followed by field crops, other fruit trees and vegetables. Olives are concentrated in the central highlands where steep slopes and shallow soils are not suitable for vegetables and field crops. Olive trees, occupying an area of over 832,000 dunums, suffer from alternate year fruit bearing. This phenomenon may be related to the genetic makeup of the varieties, but it is highly aggravated by the fluctuations in rainfall. The result is a very noticeable fluctuation in olive yield. The yield effect can be demonstrated by the fact that private profitability in 1990 was US$ 58 per dunum but in the following year there was a loss of US$ 9 per dunum. The variation in the supply of olives arises from fluctuations in production rather than prices. Moreover, the yield per tree or unit area is gradually decreasing due to declining farm maintenance and due to the weakness of the trees, which are old and poorly maintained. This in turn is due to the increasing price of inputs especially labor costs, while output prices (i.e. for olive oil), are nearly stable. Pesticides and fertilizers are either not used or are used in limited amounts. The cost of such materials is not offset by added yields. The cost of the production of olives is therefore relatively high.

(4) Profitability and Water Economy

The profitability of crop cultivation per dunum was estimated, as summarized in the following table.

Table 3.2.8 Comparison Table of Gross Margin of Major Crops in the Jordan Rift Valley Area (2003/2004)

	Cropping	Yield kg/Dunum	Gross Prifit NIS/Dunum	Total Cost NIS/Dunum	Gross Margin
Green House Vegetables					
Tomato	Year round	18,000	21,600	9,605	11,995
Cucumber	winter	10,000	15,000	5,299	9,701
Beans	winter	2,500	7,500	2,966	4,534
Outdoors Vegetables					
Industrial Cucumber	spring	2,500	4,000	1,964	2,036
Potatoes	autumn	3,000	4,500	1,906	2,594
Eggplant	spring	5,000	5,000	2,674	2,326
Cucumber	autumn	2,000	3,000	1,717	1,283
Potatoes	spring	3,000	4,500	2,333	2,167
Squash	spring	1,400	2,100	1,611	489
Bean	Spring	900	2,700	1,567	1,133
Tomato	Spring	4,000	4,000	2,355	1,645
Cauliflower	Autumn	2,500	3,750	1,359	2,391
Fruits					
Orange	6 - 20 ys	2,500	4,250	1,728	2,522
Banana	3-6 ys	4,000	4,800	2,618	2,182
Clement (Citrus)	6-20 ys	3,000	3,600	1,916	1,684
Lemon	6-20 ys	3,700	5,550	1,819	3,731
Seedless Grapes	6-20 ys	2,000	6,000	2,330	3,670
Reference Data					
Dates (Israel)	10-25 ys	1,350	23,220	11,358	11,862

Source: Agricultural Statistics, PCBS

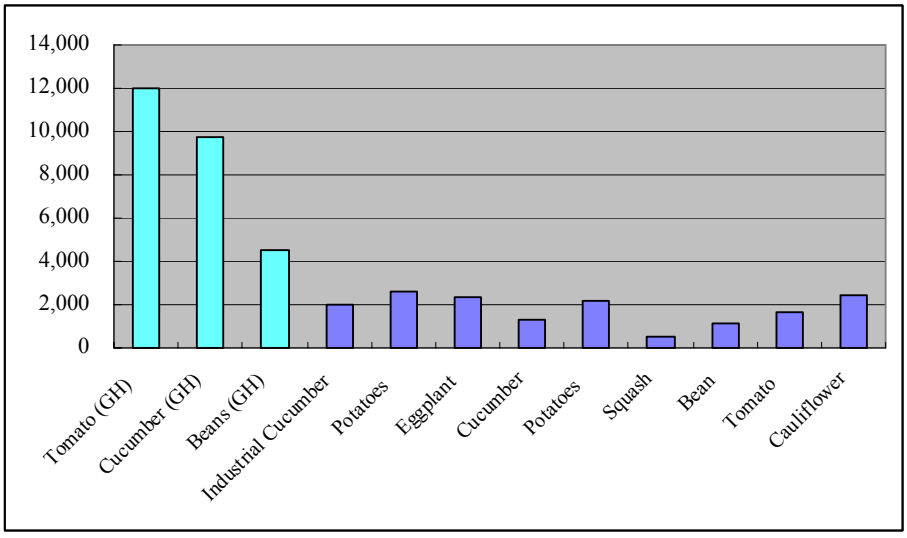


Figure 3.2.1 Gross Margin of Crops in the Jordan Rift Valley Area (NIS/dunum)

Table 3.2.9 Comparison Table of Gross Margin of Major Crops in the Highlands (2003/2004)

	Cropping	Yield kg/Dunum	Gross Prifit	Total Cost NIS/Dunum	Gross Margin
Field Crops					
Wheat*1	winter	180	324	230	94
Barley*1	winter	220	352	270	82
Chick peas	winter	800	1,200	313	887
Dry onion	winter	700	1,050	797	253
Lentils*1	winter	360	360	267	93
Fodder Crops					
Sern	winter	650	455	269	186
Vetch	winter	210	350	264	86
Fruits					
Grape	6 - 20 years	600	1,500	696	804
Almonds	6 - 20 years	123	431	293	138
Oloves	6 - 20 years	200	600	346	254
Plums	6 - 20 years	400	800	431	369

Source: Agricultural Statistics, PCBS
Note: Crops are grown under rainfed conditions

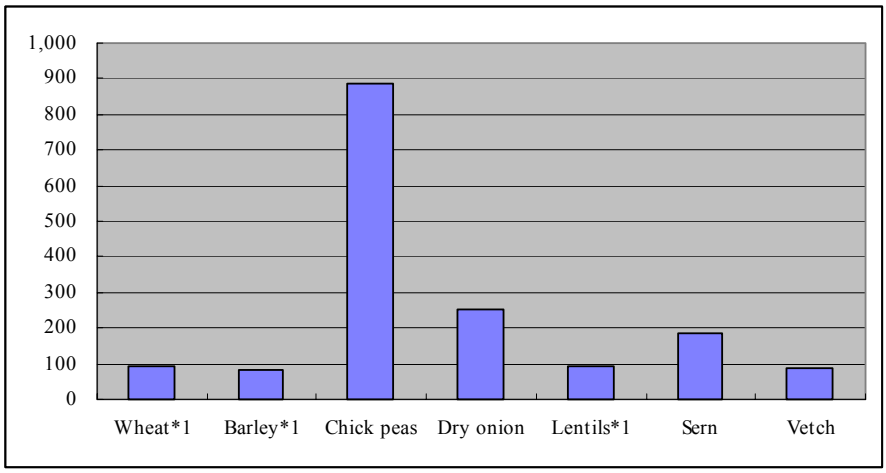


Figure 3.2.2 Gross Margin of Crops in the Highlands (NIS/dunum)

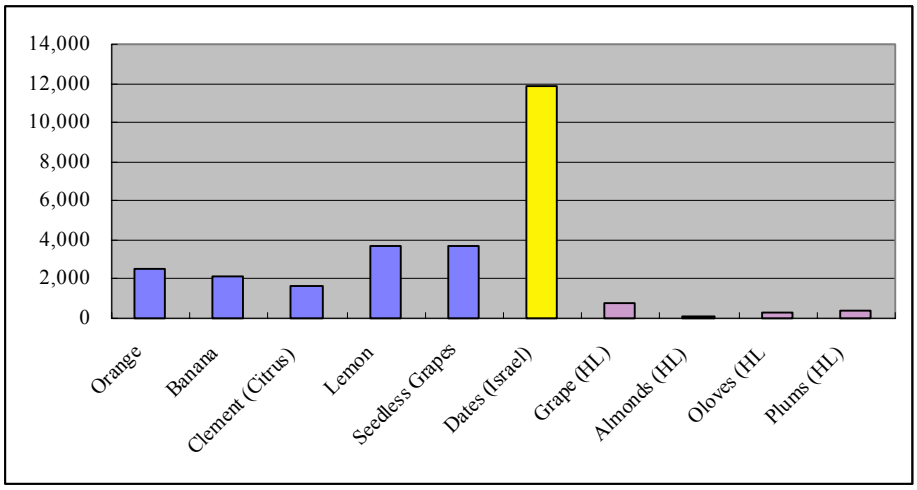


Figure 3.2.3 Gross Margin of Fruit in the Highlands (NIS/dunum)

Generally, it can be seen that the profitability of the crops cultivated under rain-fed conditions in the highlands is lower than those cultivated under irrigated conditions in the Jordan Rift Valley area. The value of the crops under rain-fed conditions remains at about one tenth of the crops under irrigated conditions.

In view of the limited water available for irrigation, the profitability of crops cultivated per water consumption is to be taken into account in the Jordan Rift Valley area. The following table shows the water requirement and the profitability per cubic meter of water.

Table 3.2.10 Comparison Table of Water Efficiency of Major Crops (2003/2004)

		Gross Margin	Water Requirement*	Gross Mar./ Water Req.
Green House Vegetables				
Tomato	Year round	11,995	1,300	9.23
Cucumber	winter	9,701	900	10.78
Beans	winter	4,534	600	7.56
Outdoors Vegetables				
Industrial Cucumber	spring	2,036	400	5.09
Potatoes	autumn	2,594	450	5.76
Eggplant	spring	2,326	800	2.91
Cucumber	autumn	1,283	500	2.57
Potatoes	spring	2,167	350	6.19
Squash	spring	489	500	0.98
Bean	Spring	1,133	400	2.83
Tomato	Spring	1,645	600	2.74
Cauliflower	Autumn	2,391	500	4.78
Fruits				
Orange	6 - 20 ys	2,522	1,000	2.52
Banana	3-6 ys	2,182	3,000	0.73
Clement (Citrus)	6-20 ys	1,684	1,000	1.68
Lemon	6-20 ys	3,731	1,000	3.73
Seedless	6-20 ys	3,670	1,000	3.67
Grapes	6-20 ys	3,670	1,000	3.67
Reference Data				
Dates (Israel)	10-25 ys	11,862	2,000	5.93

Source: Agricultural Statistics, PCBS
*1: Cubic meter

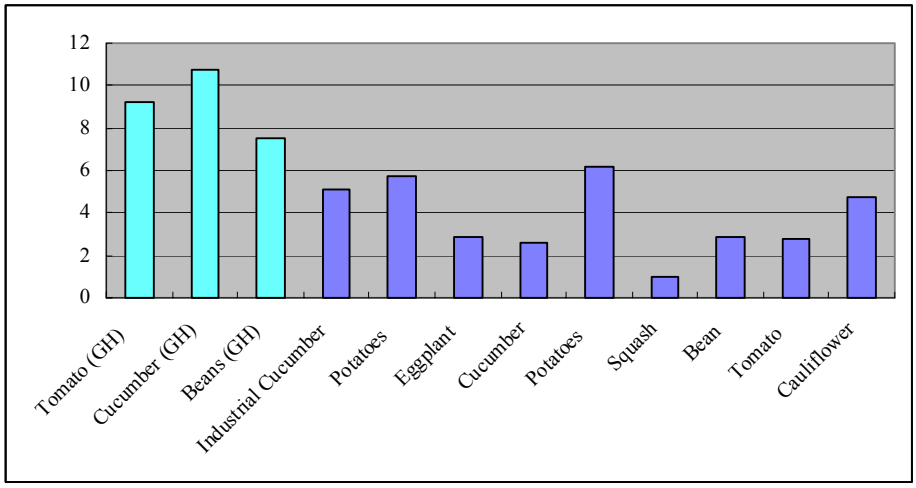
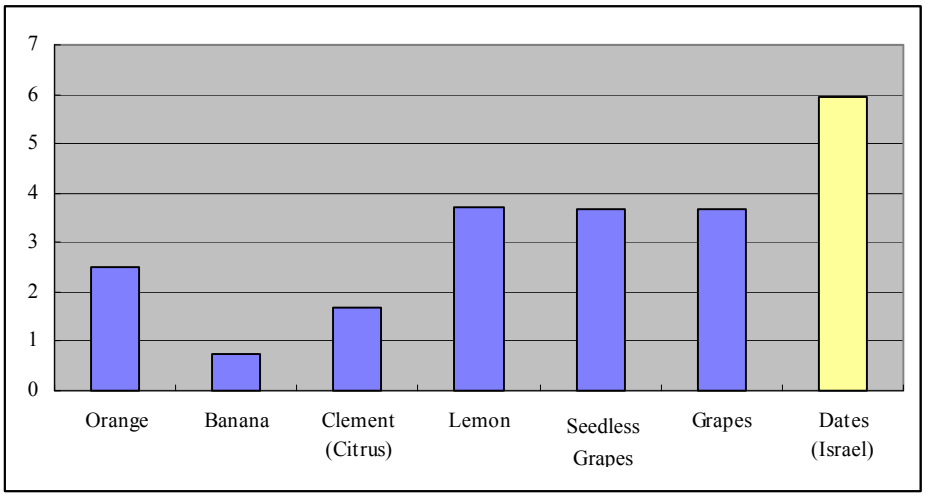


Figure 3.2.4 Gross Margin per Water Unit Required by Crops (NIS/m^3)



Note: Israeli data is presented for dates, as no data is available for the Palestinian case.

Figure 3.2.5 Gross Margin per Water Unit Required by Fruit (NIS/m^3)

The water profitability for the products grown in plastic houses is high compared to the water profitability of products grown outdoors. The main reason for this is assumed to be the higher quality of products and the stable and constant supply of products. Producers seldom take the water productivity into consideration as the cost of water is not that high. However, the optimization of water use for agriculture should take into account both the water efficiency and the profitability of crops.

For further information, the profitability per unit of hired labor is estimated as shown in the following table.

Table 3.2.11 Comparison Table of Labour Efficiency for the Major Crops

		Gross Margin	Hired Labour Requirement*	Gross Mar./ LR (hours).
Green House Vegetables				
Tomato	Year round	11,995	666	18.01
Cucumber	winter	9,701	402	24.13
Beans	winter	4,534	209	21.69
Outdoors Vegetables				
Industrial Cucumber	spring	2,036	136	14.97
Potatoes	autumn	2,594	81	32.02
Eggplant	spring	2,326	179	12.99
Cucumber	autumn	1,283	144	8.91
Potatoes	spring	2,167	81	26.75
Squash	spring	489	102	4.79
Bean	Spring	1,133	115	9.85
Tomato	Spring	1,645	118	13.94
Cauliflower	Autumn	2,391	73	32.76
Fruits				
Orange	6 - 20 ys	2,522	89	28.33
Banana	3-6 ys	2,182	126	17.32
Clement (Citrus)	6-20 ys	1,684	119	14.15
Lemon	6-20 ys	3,731	102	36.57
Seedless Grapes	6-20 ys	3,670	100	36.70
Reference Data				
Dates (Israel)	10-25 ys	11,862	41	291.45

Source: Agricultural Statistics, PCBS
*1: man-hours

3. Agricultural Machines and Equipment

The number of major agricultural machines and equipment in the West Bank area is shown in the following table:

Table 3.3.1 Number of Agricultural Machines and Equipment

Machine/Equipment	Jericho	Tubas	Study area	West Bank
Four-Wheel tractor	380	445	825	7,646
Trailer	254	331	585	5,215
Water Tank	122	248	370	2,872
Cultivator	179	232	411	5,091
Plastic Spreader	200	76	276	404
Broadcaster	3	13	16	178
Rotary Tiller	141	63	204	695
Sprayer	230	159	389	1,622
Thresher	3	21	24	640
Combine	1	15	16	44

Source: Agricultural Statistics, PCBS, 2003/04

It is important to note that number of agricultural machines and equipment in the Jordan Rift Valley area is completely insufficient for the total farmland area of 1,662,134 dunums, consisting of 131,432 dunums

of irrigated land and 1,530,702 dunums of rain-fed farmland. This fact implies that large scale rain-fed agriculture for staples and animal feed has not yet been promoted.

Most of the agricultural machines and equipment are owned by large farms (97%), and some machines which were granted from international donors (3%) are managed by the farmer's union. Small-scale and landless farmers rent the agricultural machines and equipment from private farmers or from the farmer's union. The rental charges from the private farmers vary from NIS 30/dunum to NIS 20/dunum with operators and fuel depending on the type of farming practices, whereas the rental charges from the farmer's union range from NIS 20/dunum to NIS 15/dunum, which seems to be more feasible.

In order to re-activate agricultural activities that are currently stagnant, it is essential to promote the rental of farm machines and equipment at reasonable prices. For the implementation of this project, as well as for the enhancement of rain-fed agricultural practices and irrigated farming practices, it is recommended that the number of agricultural machines and equipment is increased and the capacity of the farmer's union is strengthened with the support of the international donors.

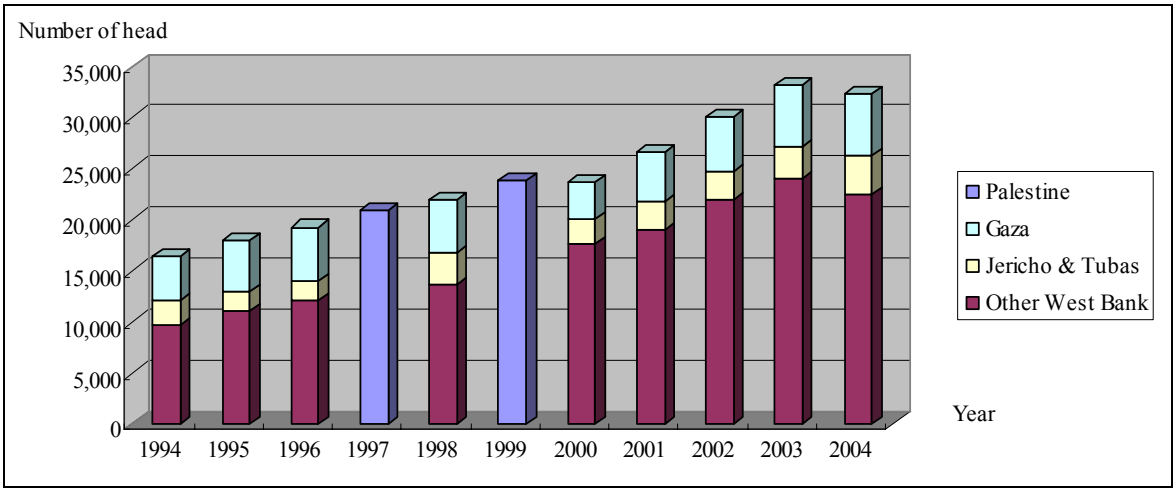
4. Livestock

The livestock sub-sector is comprised of dairy cattle, sheep, poultry, fisheries, honeybees, and work animals. The location of dairy cattle and poultry, although spread over all agro-ecological areas, appears to be concentrated in the West Bank and Gaza for cattle and the mountainous zones for poultry. Sheep and goats are extensively raised under both nomadic (transhumance) and settled village systems in the mountainous and eastern steps of the West Bank.

(1) Livestock

(i) Cattle

The trend in the number of cattle in the West Bank and Gaza during the period from 1994 to 2004 is shown in the following figure. There is no clear trend that the number of cattle has been influenced by the 2000 closures, although the increasing rate slowed down in 2001. Rather, a significant growth in the number of cattle can be observed as the general trend. It is worthy of special mention that the number of cattle has doubled over the past 10 years. In fact, between 1994 and 2004, the number of cattle increased from 16,740 heads to 32,395.



Source: Agricultural Statistics, PCBS, from 1994 to 2004

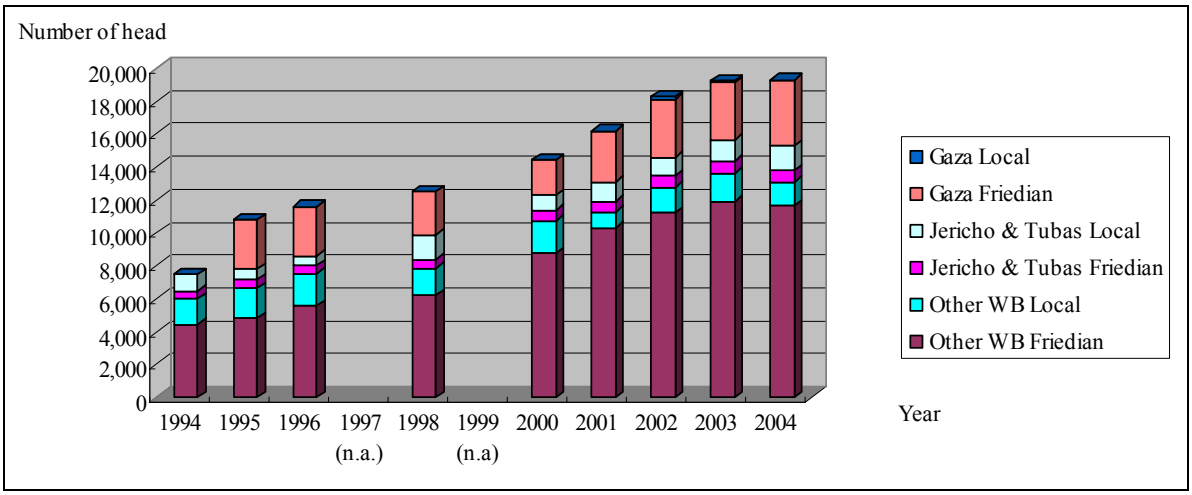
Figure 3.4.1 Trend in the Number of Cattle

Due to a shortage in the amount of milk being produced in the West Bank and Gaza, the number of Friesian cows[2] is being increased. As the milk production of Friesian cows is three times larger than that of local cows, the number of Friesian cows is being increased, whereas the number of local cows is not increasing.

Since 1986, there has been a move towards the use of Friesian cows for milk and meat production, while the number of less productive native cows has been in decline. Between 1998 and 2004, the number of local cows declined from 3,130 to 2,905, while the number of Friesians increased from 9,370 to 16,370.

The following chart shows the proportion of Friesian and local cows in 2004. In the future, the proportion of Friesian cattle is expected to increase further because of their high level of milk production and food efficiency. In the following figure, it is observed that the ratio of local cows is high in Jericho Governorate and Tubas District.

[2] Cow means the female cattle which produces milk.



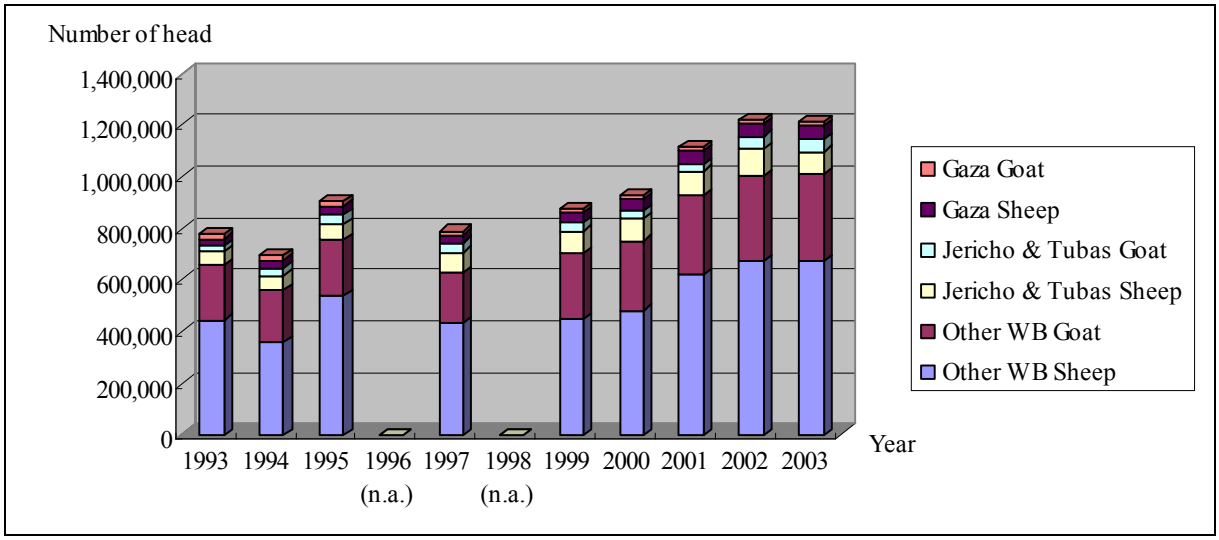
Source: Agricultural Statistics, PCBS, from 1994 to 2004

Figure 3.4.2 Number of Friesian Cows and Local Cows

(ii) Sheep and goats

The number of sheep has increased at a faster rate than the number of goats, although both are increasing as shown in the following chart. The purpose of breeding sheep and goats is for the production of milk and meat. Between 1997 and 2003, the number of sheep increased from 538,000 to 811,864. At present, 8.7% of the sheep population is being intensively raised in coastal areas.

Goats are concentrated mainly in the central mountainous areas. The Mamber (Baladi or black) goat is predominant. Between 1997 and 2003, the number of goats increased from 252,000 to 399,000. The Shami goat is an indigenous breed whose population has been declining over the past three decades. At present, there are only a small number of Shami goats even though the breed is known for its high performance and significant degree of adaptation to the local environment. The Shami goat has great potential as an alternative to the Baladi goat.



Source: Agricultural Statistics, PCBS, from 1994 to 2004

Figure 3.4.3 Number of Sheep and Goats

(2) Livestock Grazing

(i) Pasture for grazing

In the West Bank and Gaza, the common system of raising and feeding livestock is shifting from an extensive system to a semi-intensive or intensive system and owners feed concentrates and hay to cattle, sheep and goats in barns, houses and/or open yards. In spring, after the rainy season and during the period when there is plenty of green grass in the pastures, the animals are taken for short distance grazing because the Israeli's prohibit free grazing for the reason of security.

Restricted free grazing creates a shortage of fodder and forage for animals and most fodder and concentrates are imported from Israel at high prices. The expenditure required for raising livestock in confined areas is high and the benefits derived from the livestock industry decrease.

(ii) Animal health

Following are the reported outbreaks of diseases to OIE in 2004. Foot and mouth disease (FMD), Peste des Petit Ruminants (PPR), Sheep pox and Goat pox, Newcastle disease, Anthrax, Echinococcoisis, Q fever, Paratuberculosis, Bovine cysticercosis, Caprine and ovine Brucellosis, Contagious agalactia, Ovine chlamidiosis (Enzootic abortion of ewes), Avian infectious bronchitis, Fowl pox, Avian mycoplasmosis, Acariosis of bees, Varroosis, Toxoplasmosis, Coccidiosis , Foot-rot, Enterotoxaemia, Sheep mange, Avian leucosis.

Table 3.4.1 Number of Sheep & Goats Vaccinated against Brucellosis

District	1999	2000	2001	2002	2003	2004	2005
Hebron	220,569	62,402	65,738	137,698	201,168	61,164	153,529
Bethlehem	96,361	11,480	19,248	21,842	97,596	34,068	82,184
Jericho	71,377	24,623	22,585	34,540	67,629	32,020	67,382
Jersalem	33,041	15,127	5,625	6,375	47,106	19,816	53,691
Ramallah	91,957	34,659	19,085	36,507	74,889	25,685	71,141
Salfit	16,206	1,145	6,757	7,704	27,521	18,352	26,504
Nablus	96,716	34,035	26,135	30,109	79,636	41,434	110,596
Qalqilya	30,005	25,478	10,175	19,702	35,326	18,389	38,570
Tulkarim	19,139	11,329	10,857	12,057	42,231	23,622	45,181
Jenin	109,955	27,570	24,275	24,866	107,970	34,474	93,853
Tubas	46,355	17,860	10,965	12,941	38,944	33,198	35,353
Gaza	n.a.	n.a.	n.a.	n.a.	n.a.	10,000	20,000
Total	831,681	265,708	221,445	344,341	820,016	352,222	797,984

Sources: Veterinary Service Department

The table above shows the number of sheep and goats vaccinated against Brucellosis. As the vaccination campaign against Brucellosis is concentrated in every 2 years, the first year consists of all sheep and goats, except pregnant ones, being vaccinated. The next year, the campaign targets young sheep and goats that were not vaccinated in the previous year. In 2001, the Second Intifada resulted in the vaccination campaign being heavily suppressed even though that year there was supposed to be a concentrated vaccination campaign.

As the rate of pregnant sheep and goats is approximately 20%, the total number of sheep and goats in 2005 was 950,000.

In the West Bank and Gaza, vaccinations fall into two categories. Category one are free-vaccines for FMD and Brucellosis, and the category two are paid-vaccines for the private interest of owners such as PPR, Anthrax, Blue tongue and Enterotoxaemia. All of the vaccines are acquired from Israel based on the "Paris Agreement".

(iii) Livestock genetic improvement

In arid and semi-arid areas like the West Bank, the genetic improvement of livestock can maximize the productive performance of the livestock under minimal or poor natural resource conditions. The activity of livestock improvement has not been fully introduced despite the fact that people have a good understanding of the importance of genetic improvement. Although the limited area of grazing pastures and the year-round shortage of fodder are matters of concern that need to be solved promptly, breeding improvement is still in the procedure of being completed.

Shami goats, Awassi sheep and Asaf sheep are pure races in the West Bank and Gaza. Shami goats can produce 500 liters of milk per year and the live body weight of an adult Awassi sheep

reaches 80 kg. Cattle mate naturally in the fields and artificial insemination is not a common practice. The price of one pure Shami goat is higher than US$ 5,000 per head and some shepherds raise pure goats and sheep as a hobby.

(3) Livestock Production

(i) Meat production

The production of poultry has changed significantly over the past decade. It is estimated that approximately 63,000 tons were raised in 2003 throughout the country. A significant proportion of sheep and goats are kept under nomadic and settled village systems of farming. In 2003, 23,600 tons of red meat produced in the West Bank and Gaza came from sheep, 8,120 tons from goats, and 5,026 tons from dairy cattle. The total meat production in 1994 was 16,600 tons, while the production increased to 36,700 tons in 2003 as shown in the following figure.

Table 3.4.2 Meat Production

Year	Palestine					West Bank					Study Area (Jericho & Tubas)				
	Goat	Sheep	Cow	Chicken	total	Goat	Sheep	Cow	Chicken	total	Goat	Sheep	Cow	Chicken	total
1994	4,303	8,921	3,392	46,058	62,674	4,153	8,661	2,967	29,058	44,839	187	568	447	774	1,976
1995	3,595	4,612	1,523	48,560	58,290	3,310	4,301	1,101	29,520	38,232	417	605	166	1,219	2,407
1996	7,767	13,147	1,633	43,448	65,995	7,197	12,422	1,210	30,448	51,277	1,050	1,264	150	1,321	3,785
1997	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1998	7,186	11,147	3,260	65,534	87,127	6,733	10,547	2,574	44,279	64,133	1,100	1,572	527	2,337	5,536
1999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2000	8,800	11,733	3,770	73,873	98,176	8,370	11,000	3,211	25,580	48,161	995	1,727	409	3,289	6,420
2001	8,933	12,761	4,223	81,413	107,330	8,509	11,822	3,413	55,008	78,752	809	1,818	470	2,904	6,001
2002	10,125	15,711	4,763	83,147	113,746	9,699	14,710	3,801	63,425	91,635	826	1,887	461	3,350	6,524
2003	8,124	23,608	5,026	63,013	99,771	7,823	22,210	4,084	44,215	78,332	992	3,035	523	1,309	5,859

Unit: ton
Source: Agricultural Statistics, PCBS, from 1994 to 2004

(ii) Quality control of meat

Most slaughterhouses do not possess any laboratory functions. This results in unauthorized and potentially unsanitary meat being conveyed out into the markets.

(iii) Milk production

The increase in milk production is mainly based on cow and sheep milk. In 2003, 93,900 tons of milk produced in West Bank and Gaza came from dairy cows. In the same year, 32,900 tons of milk came from goats and 58,000 tons from sheep. The total milk production in 1994 was 87,700 tons and this increased to 184,800 tons in 2003 as shown in the following figure.

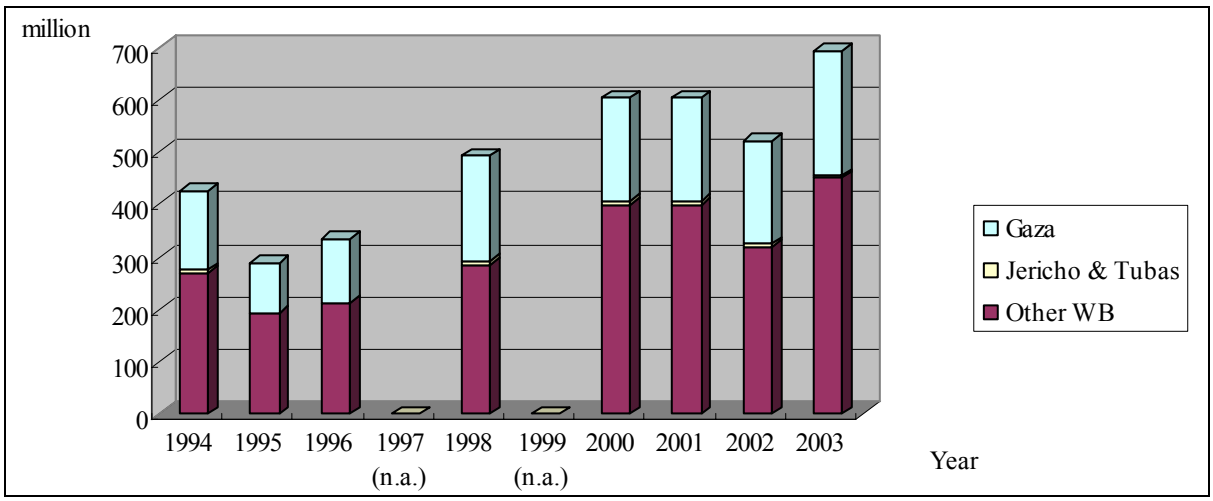
Table 3.4.3 Milk Production

Year	Palestine				West Bank				Study Area (Jericho & Tubas)			
	Goat	Sheep	Cow	Total	Goat	Sheep	Cow	Total	Goat	Sheep	Cow	total
1994	19,727	33,432	34,547	87,706	17,727	31,932	21,047	70,706	2,005	3,429	2,549	7,983
1995	21,188	31,160	49,848	102,196	19,508	29,060	33,348	81,916	2,459	4,081	3,861	10,401
1996	22,902	44,414	53,774	121,090	21,222	41,964	37,274	100,460	3,097	4,273	3,578	10,948
1997	-	-	-	-	-	-	-	-	-	-	-	-
1998	21,189	37,661	56,545	115,395	19,853	35,635	42,110	97,598	3,244	5,312	5,360	13,916
1999	-	-	-	-	-	-	-	-	-	-	-	-
2000	25,943	39,649	68,095	133,687	24,676	37,169	56,307	118,152	2,935	5,836	4,937	13,708
2001	26,340	43,110	80,733	150,183	25,087	39,939	63,649	128,675	2,384	6,143	5,281	13,808
2002	29,851	53,079	89,290	172220	28,595	49,694	69,599	147,888	2,437	6,377	5,424	14,238
2003	32,939	58,007	93,881	184,827	31,717	54,571	74,573	160,861	4,021	7,458	6,128	17,607

Unit: ton
Source: Agricultural Statistics, PCBS, from 1994 to 2004

(iv) Egg production

It is estimated that, as of 2003, approximately 2.4 million hens are in production throughout the country. Egg producers are rare, only 15% of egg-producers are replaced by locally raised pullets the remainder (105-day-old pullets) are purchased from Israeli sources at high prices. A well-managed flock can produce up to 245 eggs/hen over a one-year production cycle, with the national average rarely exceeding 230 eggs/hen. As shown in the following figure, between 1994 and 2003 the number of eggs produced per annum increased from 426 million to 659 million.



Source: Agricultural Statistics, PCBS, from 1994 to 2004

Figure 3.4.4 Number of Eggs being Produced

(v) Quantity of food supplied from livestock

The West Bank and Gaza imports a lot of food from external sources, mainly from Israel, because the volume produced by the livestock industry is insufficient to supply all Palestinians.

Nonetheless the quantity produced has expanded rapidly in recent years, as discussed above. The following table shows the food supply per capita produced from the livestock industry in the West Bank and Gaza.

Table 3.4.4 Consumption of Livestock Products per Capita

	Population	Consumption / Capita/Year		
Year	(x1000)	Meat (Kg)	Milk (Kg)	Egg
1997/1998	2,897	30.1	39.8	170.5
1998/1999	3,019			
1999/2000	3,019	32.5	44.3	200.4
2000/2001	3,275	32.8	45.9	184.7
2001/2002	3,394	33.5	50.7	153.8
2002/2003	3,515	28.4	52.6	197.7

Source: Agricultural Statistics, PCBS, from 1994 to 2004

5. Distribution and Processing of Agricultural Products

(i) Demand/supply of agricultural products

Most agricultural products in the Jordan Rift Valley area are cash crops such as vegetables and fruit that are not for self-subsistence but for sale. The supply fulfills the demand of consumers in the West Bank during the harvest season, from October to March, with a large surplus during the second half of the season. During the summer, there is little supply of products even though the demand is high. As cultivation depends largely on seasonal changes, shipping adjustments are not easily realized.

The following figure illustrates the fluctuations in the gate prices for agricultural products. This is one of the indicators that show the balance between demand and supply. According to the interview survey, when the prices drop below the cost of production and transportation many growers throw the surplus away and then wait for the price to bottom out.

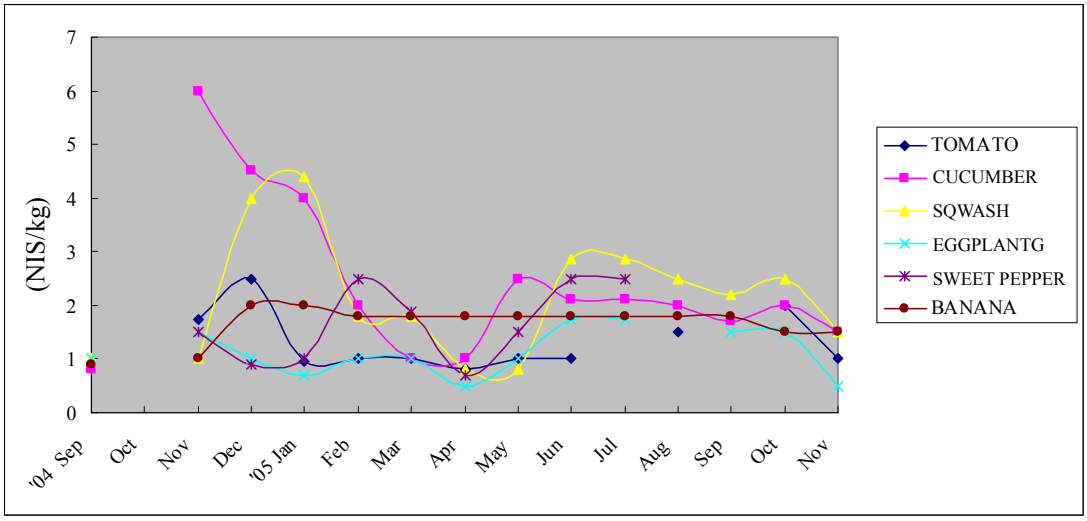


Figure 3.5.1 Price Fluctuation of Typical Cash Crops in the Jordan Rift Valley

In Israel, growers export vegetables to European markets to gain the advantage of the staggered harvest seasons. These exports influence the production inside the West Bank and Gaza. According to the observations made at a wholesale market in Jericho City, 40% of the horticultural products are exported out of the West Bank, and some of them are transported to European markets through Israel[3]. As these are indirect exports, the magnitude of the trade from the Jordan Rift Valley to Europe is not known. However, the potential to expand the volume of exports to Europe in winter has been pointed out by Israeli traders. When the physical constraints of marketing are resolved, vegetables could be one of the strategic exports.

(ii) Distribution channels

Most growers in Jericho Governorate utilize the wholesale markets in Jericho City and sell their products to traders from Bethlehem, Hebron, and Nablus.

Although the agricultural products in Tubas District are similar to those in Jericho Governorate, the farm-gate price for vegetables in Tubas is lower than that in Jericho, due to its disadvantage with the poorer road conditions. Overall, the consumer market prices at their major target, Nablus, are lower than those in the other towns in the West Bank. Furthermore, traders in Nablus tend to come to Jericho even though it is a further distance because of the convenience of the road networks and the range of the wholesale market. The Ministry of Agriculture (MoA) recommends that farmers grow fruit instead of perishable vegetables.

Growers along Route 90 are shipping vegetables directly to Israel through intermediaries. Vegetables sold in Jerusalem are mainly from Israel.

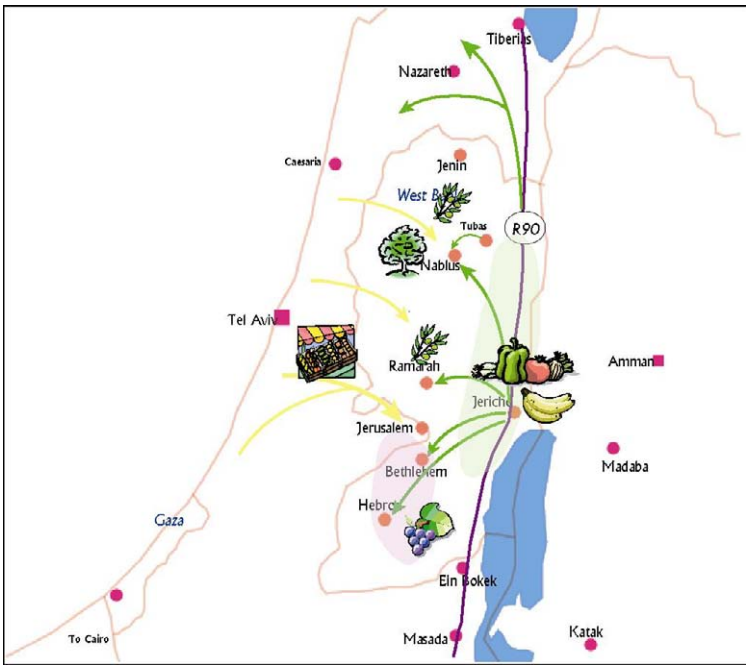


Figure 3.5.2 Distribution Channels for Vegetables

[3] Of the other 60%, 45% fulfills the demand of the West Bank and 15% goes to Jericho.

The wholesale market in Jericho City has been playing a significant role in the trade of horticultural crops since 1968. Most growers in Jericho bring their products to the wholesale market and ask designated commissioners to sell them at appropriate prices. Commissioners sell these products at the auction and take 7% of the transaction value as a commission. The circulating boxes are rented and the volume is counted by box and not by weight. The wholesale market deals with 600,000-700,000 boxes a year. The estimated value of the dealings in the wholesale market is approximately NIS 12 -14 million (US$ 2,580,000 – US$ 3,010,000).

Unfortunately, there is no relief from price fluctuations at the auctions in the wholesale market. For instance, eggplants that may be sold at NIS 30/box at six o'clock could drop to NIS 15/box by seven o'clock. The wholesale market has not been functioning well as a practical means of price stabilization. In addition, the wholesale market is a cause of traffic jams as the roads in Jericho City fill up with trucks and tractors carrying commodities from six o'clock until nine o'clock during the winter season. The problem is not only the narrowness of the roads and the shortage of parking lots but also the small size of the auction space at the market. Most auctions are carried out on the road near the market and cause blockages along the transport routes.

Auction at Roadside

Wholesale Market in Jericho

(iii) Agro-processing industry

The agro-processing industries in Jericho Governorate and Tubas District consist primarily of primitive processes such as bread making, cheese, pickles and local cakes for neighbors. There are few processing factories that have a wide market. Due to a shortage of financial resources for the introduction of modern technologies such as cooling and automation systems, agro-processing businesses have remained at a primitive level. The following is a summary of the agro-processing businesses in the Jordan Rift Valley area.

Vegetables

Vegetables harvested in Jericho are for fresh consumption. There are no market channel in which to sell vegetables as raw materials for processing. Some factories established in Hebron by the Israeli capital purchase raw vegetables from Israeli growers but not from Palestinian growers. Most surplus products of the Jordan Rift Valley area are discarded on the farm fields.

Fruit Trees

Oranges *and* ***Bananas*** are the major products of the Jordan Rift Valley. At one time, the Kingdom of Jordan was a major market for these products. However, farmers on the other side of the Jordan started producing these products in order to fulfill the demand of consumers in Jordan. The prices then dropped and subsequently the cropped area declined due to the lowered prices.

Dates have been regarded, in recent years, as an alternative crop to bananas and other unprofitable vegetables. There are regular traders for dates and the prices are relatively stable. Processing, however, depends on the Israeli factories, and Palestinian growers remain as the suppliers of the raw materials.

Olives are processed into oil and pickles in the highland areas of the Jordan Rift Valley, including the Tubas District. There is a movement of farmers' groups formulating cooperatives and/or unions to make milling processes more effective and efficient. They are introducing new oil mills from Italy and are improving the quality of the olive oil. Post-harvest technologies for olives have been improving and some leading enterprises are exporting olive oil under original brands. Thus, the growers are encouraged to export olive oil to the increasing international markets.

The MoA, on the other hand, intends to improve the local market for olive oil in addition to the international market. The local market still remains at a primitive trading level and consumers are not particularly critical about the quality or packaging of the products. In the domestic market, awareness of quality assurance should be improved.

Almonds are also a potential product in the upland areas of the Jordan Rift Valley from the viewpoint of marketing. The profitability is higher than that of olives, and farmers consider almonds as another alternative.

Meat and Dairy Products

Meat is in short supply in the West Bank. As the demand for meat and dairy products is higher than the supply at all times, Palestinian traders need to purchase living livestock from Israeli breeders. According to the demand, livestock are carried along tracks to the slaughterhouses

near the consumer's markets. The demand is highest during the festivals of Ramadan. Therefore, the potential market for meat must be significant.

The critical constraint in the breeding of livestock is the shortage of feed. Most breeders, even Bedouin breeders, have to buy imported feed. Regardless of this the livestock business is still considered profitable.

Most ***Dairy Products,*** such as cheese, are imported from European Countries. If the storage and cold-chain constraints were resolved, it would be possible to compete with imported dairy products even though the quality of the competition is tough.

Fish

Gaza is the source of seafood for the West Bank, however due to the roadblocks the distribution has dropped substantially since 2000. Tilapia and catfish cultivation in the West Bank has also terminated due to the closure. In recent years, it has become difficult to obtain fresh fish in the Jordan Rift Valley area, even though there is substantial demand.

(iv) Marketing and sales promotion

In terms of the competitiveness of the agricultural products in the Jordan Rift Valley area, there are limited advantages in price, scale or recognition compared to neighboring countries. Due to the high costs associated with workers and agricultural inputs, the prices of agricultural products are less competitive. The production and marketing volumes are not large enough to enjoy the merits of scale. In the case of targeting value-added niche markets, the marketing strategy should be developed; however, the degree of recognition in quality still remains at a low level. A marketing strategy is needed to disseminate the characteristics of the location of the Jericho products.

(2) Potential and Constraints of Agri-business

The potential and constraints of agri-business in the Jordan Rift Valley area have been identified through field surveys and Working Group meetings.

(i) Potential and strengths of agri-business

The Jordan Rift Valley area is a unique area in terms of both environment and climate. Jericho has developed as a center of vegetable and fruit cultivation, making use of the unique natural conditions. Internationally marketed crops such as dates, olives and almonds are growing in the area. The advantages are enhanced by the location due to the fact that the east-west and south-north corridors cross in Jericho. From the viewpoint of marketing strategies, it is possible to emphasize the uniqueness of Jericho's climate, environment and even cultural background in order to create a local brand.

Consequently, the potential and strengths are; (i) the good location for transportation in every direction, (ii) suitable environment and climate for horticulture to enable the regional demands to be met, (iii) rich in the raw materials of processed foods (e.g. olives, date palms and almonds), and (iv) uniqueness of locality.

(ii) Constraints on agri-business

Although the potential for agri-business in the Jordan Rift Valley area is high, there are many constraints on the implementation of the Agri-business Development Plan. For instance, even if the location is at the center of the corridors, security checkpoints often interfere and cause damage to fresh vegetables.

As the cultivation of local products is largely dependent on the natural climate and environment, the peak of the harvest season is in the winter season. A large surplus causes the prices to decline and the role of the wholesale market is not properly utilized at present. The problems that need to be solved are; (i) large fluctuations in vegetable prices, (ii) lack of quality assessment, grading and inspection, (iii) lack of storehouses and cold chain systems, (iv) inefficient auctions at the wholesale market, (v) traffic jams caused by the wholesale market, (vi) time loss and quality/quantity loss caused by the check points, (vii) little value-added in agri-business, (viii) little differentiation of local products and (ix) little consideration of the principle of comparative advantages in the target areas.

6. Agricultural/Rural Financing

Several studies have been conducted to assess the agricultural and rural financial situation in Palestine and to examine alternative institutional arrangements to enhance farmers' access to credit and to mobilize rural savings. Based on these studies, the MoA concluded that the establishment of a public agricultural credit bank is neither a viable nor desirable option. It also became clear that commercial banks would continue to be reluctant to provide agricultural/rural credit, particularly to small farmers, because of high risk and administrative costs and lack of guarantees. Although several NGOs currently implement rural credit programs, these programs do not seem financially sustainable, given their heavy dependence on donor funding.

In light of the above, the MoA has opted to promote Rural Finance Cooperatives (RFCs) as the main model to enhance farmers' access to credit and mobilize rural savings. While requiring technical and financial support to become established, the RFCs will operate on a commercial basis as independent lending and savings institutions. The boards elected by the members will establish lending and savings policies, including setting interest rates, requirements for loan approval, loan guarantees, loan collection and bad loan foreclosures, etc. It is envisioned that independent RFCs will be established throughout the West Bank and Gaza, and their activities will be coordinated by a federation of RFCs or, possibly, by a

federation of micro-credit cooperatives operating in various sectors of the economy (i.e. not necessarily limited to rural cooperatives).

In the medium term, and until such a time when the proposed RFCs become financially viable and sustainable, their establishment and promotion will require a special rural/agricultural "revolving fund" financed by a soft loan from international lending agencies and guaranteed by the MoA and/or the Ministry of Finance (MoF). The fund will be used to provide starting capital for the nascent RFCs to match the contribution of the members, provide low-interest loans to the RFCs, provide loan guarantees, etc.

To cope with the above, the MoA formulated a "Developing a Sustainable Rural Financing System" project. This project will establish 4-6 pilot RFCs to test the feasibility of such organizations in mobilizing rural financing for agricultural loans. The project will be implemented in two phases. Phase I will include a detailed feasibility study to assess the sustainability of the proposed model and to develop detailed recommendations on alternative modalities, legal organizations and operating guidelines for the successful implementation. Phase II will involve the set-up of a pilot "revolving fund" and establishment of 4-6 pilot RFCs in selected districts/communities. Phase II will also include a thorough evaluation of the established pilot RFCs, based on which a decision will be made on whether to launch a follow-up project that would see the gradual expansion of RFCs throughout the West Bank and Gaza. While the MoA is the implementing agency, individual RFCs should be completely privatized as they become sustainable, the owners being the beneficiaries they serve.

However, there is no on-going or foreseeable activity in this program area unless donor assistance is received. . Rural finance projects to date have been limited to feasibility studies on provision of credit to farmers and how to alleviate farmer's losses from natural agricultural disasters. The MoA believes it is of crucial importance to act on the credit issue now. Many farm-based projects to improve productivity and conserve natural resources require investments by farmers, for example modern irrigation systems. Most farmers cannot afford these improvements without access to credit. The MoA has rejected the idea for a government agricultural credit window and has recognized the unwillingness of the private sector commercial bank to provide this credit. It proposes a project to test the feasibility of rural finance cooperatives as a means to mobilize rural savings for investment in agriculture. If successful, the pilot cooperatives will be used as a model to establish a national system.