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A BASELINE SOCIO-ECONOMIC STUDY OF THE SOUTHERN GHORS AND WADI ARABA

By

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A Report to the
U.S. Agency for International Development
Amman - Jordan

Contract No: AID/NE-C-1807
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PREFACE

1. This baseline socio-economic study of the Southern Ghors and Wadi Araba, in the southwest of the Hashemite Kingdom of Jordan, was conducted during the period between 17 March, and 3 April, 1979. The study is intended to provide some preliminary insights into the conditions, needs and priorities of the residents of these two areas.

2. The reader who would like to obtain more information about village life in different parts of Jordan, is encouraged to supplement his reading of this report, by another study, which was recently completed by the author:

> Dajani, J. S. and M. S. Murdock, Assessing Basic Human Needs in Rural Jordan. Report to the U.S. Agency for International Development. Contract No. AID-278-322, September, 1978, 117 pp.

3. The author wishes to acknowledge the help and support which he received from Dr. Edgar Harrell, Mr. Thomas Pearson, Mr. James Shea, Mr. Aied Sweis and Ms. Carol Steele from AID/Jordan. He also wishes to express his gratitude for the hospitality, consideration, insights and assistance of H. E. Dr. Munther Haddadin, Senior Vice President of the Jordan Valley Authority (JVA). Mr. Fares Nimri of the JVA, was extremely helpful during the field work and data collection phases of the study. The diligent and careful typing of Ms. Jeanette Soussou, Ms. Julia Hannoun, and Ms. Duc Wong of various drafts of this report have turned what initially seemed like a mission impossible, within the time available, into a reality. Needless to say, without the cooperation, patience and candidness of the farmers workers and bedouins of the Southern Ghors and the Wadi Araba, this study would not have been possible.

4. One Jordanian Dinar (JD) is equivalent to about U.S.$3.30, at April 1979 exchange rates. One Dunum of land area is equal to 1000 square meters, 0.1 hectares, or 0.2470 acres. One kilometer equals 0.625 miles. Rounded number approximations are used in all monetary, land-area and distance unit conversions used in this report.

1. INTRODUCTION

This study is intended to provide a baseline socio-economic survey of the Lower-Rift Valley of the Hashemite Kingdom of Jordan. This area is one of the most remote and desolate areas in Jordan, and consists of the area extending from the Lisan penninsula or the mouth of Wadi Ibn Hammad in the southeast of the Dead Sea in the north, to Aqaba in the south. The western boundary of the study area runs along the truce line, while its eastern boundary is the 500 meter elevation contour line in the foothills of the steep barren slopes of the Rift Valley escarpment. Figures 1 and 2 show the study area in relationship to Jordan, and the area itself, respectively. While much has been accomplished during the past two decades in the way of agricultural and infrastructure development in those parts of the Jordan Valley which lie north of the Dead Sea, the area included in this report has not received much of the development effort. On 15 May 1977, however, a Government Decree was issued under which the responsibility for the total development of these areas was vested in the Jordan Valley Authority (JVA). It is in the spirit of this Decree, that this study is being undertaken.

The study area can be divided into two socially and economically distinct areas: The Southern Ghors and the Wadi Araba. The Southern Ghors area, in turn can be divided into two subareas: Mazra'a in the north and Safi in the south. A detailed map of this area is shown in Figure 3. The Wadi Araba area can also be divided into northern and southern subareas. These two subareas are divided by Wadi Uhaimer, about 55 kms north of Aqaba. The following sections of this report will describe the land, the people, employment and the economy, services and infrastructure, and needs and priorities in each of these areas. The last two sections will address the question of future scenarios for the development of these areas and will present the conclusions and recommendations of this study.

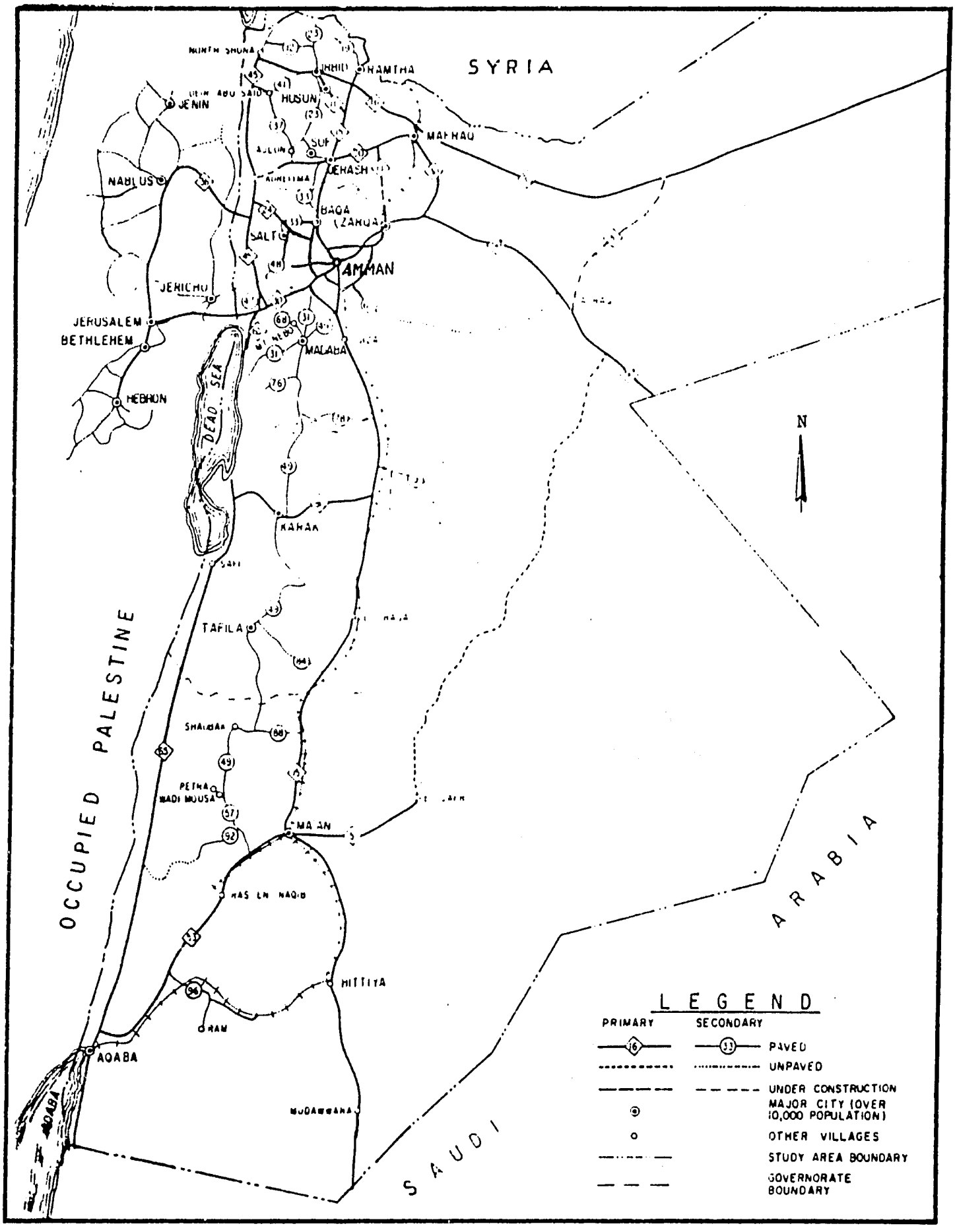

Figure 1
THE HASHEMITE KINGDOM OF JORDAN

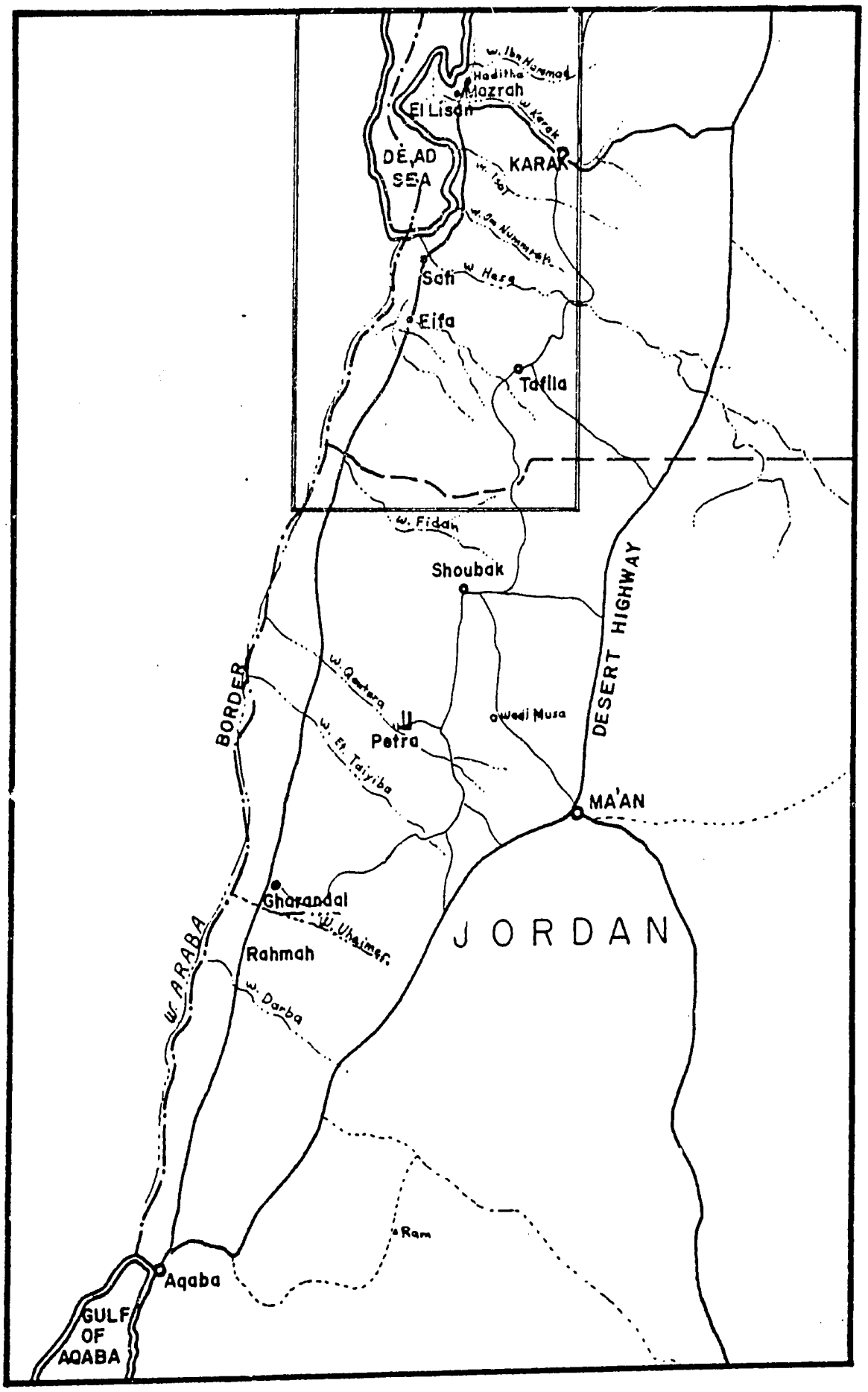

Figure 2
THE SOUTHERN GHORS & WADI ARABA

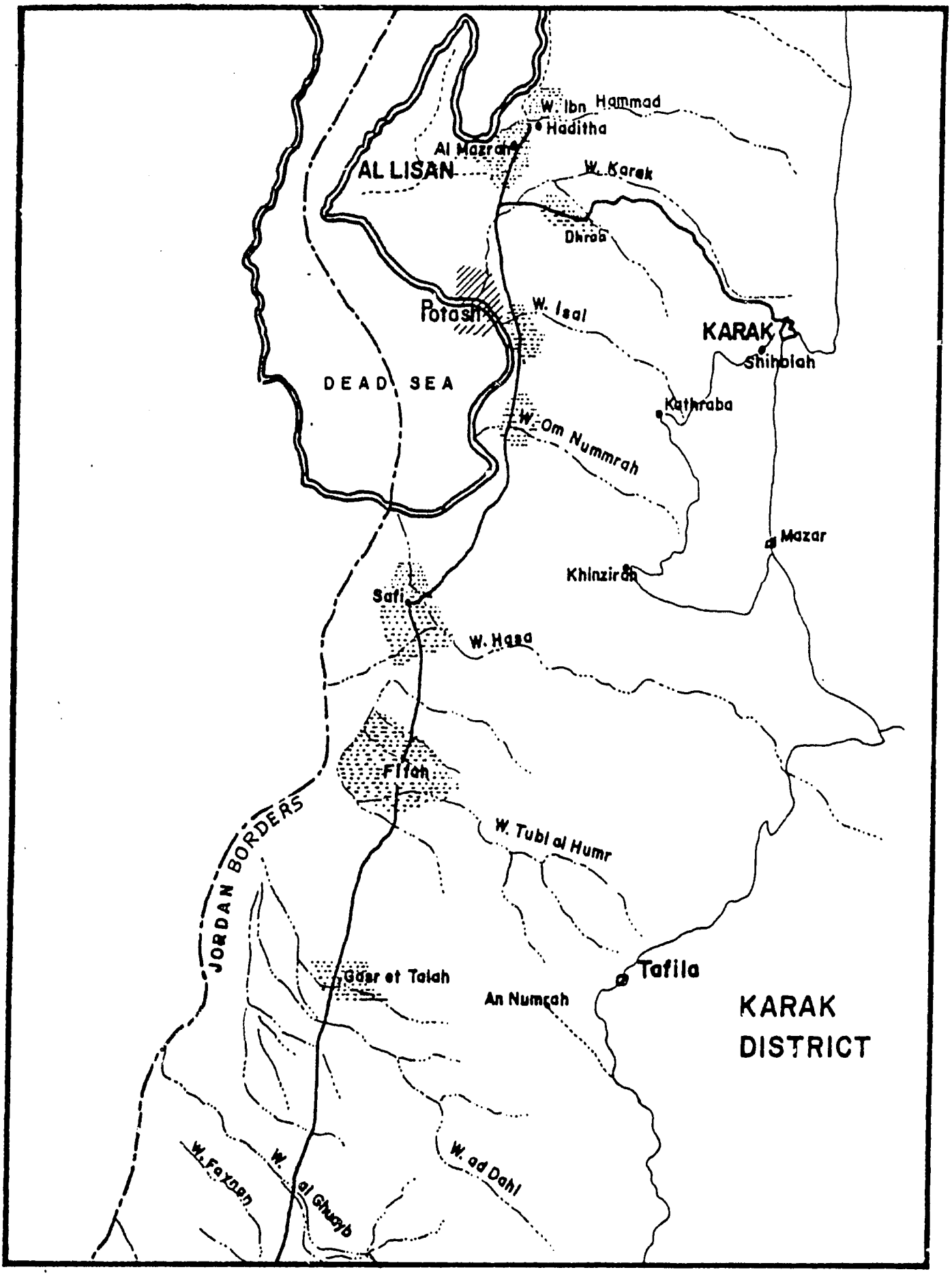

Figure 3
THE SOUTHERN GHORS

2. THE LAND

The Southern Ghors (lowlands) consist of a number of small alluvial fans lying along the southeastern shores of the Dead Sea. They lie on the floor of the Rift Valley, 1600 meters below the East Jordan plateau, and 350 meters below the Mediterranean sea level. The eastern side of the Rift Valley is formed by steep bare mountainous slopes, traversed by a number of wadis (valleys) draining the highlands into the Dead Sea Basin. These wadis are highly susceptible to flash flooding and have thus eroded some very wide channels in certain locations. With an annual rainfall of about 70 mm only, it is imperative that additional supplies of water be made available in order to insure a successful agricultural economy. At the present time agricultural activities take place only where water can be obtained from flow in the wadis, which in turn collect water from higher rainfalls occuring in the high escarpment of the Rift Valley; or from springs which emerge from fairly deep aquifers. While large areas of cultivable land are available in the area, only a small portion of them is presently cultivated, as a result of the water shortage. It is estimated that this portion amounts to 26000 dunums (about 6000 acres). The distribution of cultivated land among the eight major agricultural areas, and the estimated production values in Jordanian Dinars are shown in Table 1. As shown, total annual agricultural production in the Southern Ghors has a value of about JD 2.3 million (U.S. $7.6 million). The Jordan Valley Authority (JVA) is presently planning a proposed Mujib and Southern Ghors Irrigation project which would increase the total cultivable area in the Southern Ghors to about 86000 dunums (about 20,000 acres) by 1986/87. This increase in the area of cultivable land, coupled with improved productivity and farming practices, can be expected to increase the value of agricultural production to about JD 20.0 million (U.S. $66.0 million), in 1979 Dollars.

Wadi Araba consists of two major sub-basins: those of the Dead Sea and the Red Sea. The divide between the two lies about 15 kilometers north of Gharandal, and has an elevation of about 280 meters above sea level. The wadi is about 180 kilometers (110 miles) long and between 10 and 30 kilometers (6-20 miles) wide. The valley floor slopes from east to west, with gentle slopes toward the Dead Sea in the north, and the Red Sea in the south. The eastern escarpment ranges in elevation between 1000 and 1600 meters above sea level, and is made up of sandstone formations in the north and igneous rocks in south. Side wadis from the escarpment continue to flow into Wadi Araba. Most of these wadis however, are ephemeral or intermittant, with the exception of Wadi Hasa, Wadi Feifa and Wadi Khneizira in the north. These wadis contribute to agricultural lands in the Southern Ghors area.

As a result of the shortage of water, agriculture is almost non-existent in the southern parts of Wadi Araba. It actually tapers off as one moves south from the Safi area to Qa'a Sai'di-yin, north of Gharandal, and virtually disappears thereafter.

Table 1

AGRICULTURAL LAND AND PRODUCTION IN THE SOUTHERN GHORS

Name of Location	Crop Area (dunums)		Production Value (JD)	
	Tree Crops Excluded	Tree Crops Included	Tree Crops Excluded	Tree Crops Included
I. SAFI AREA (South)				
Ghor Safi	11,922	12,918	1,183,181	1,202,599
Ghor Feifa	2,448	2,448	106,734	106,734
Ghor Numeira*	1,070	1,070	111,172	111,172
Ghor Khneizira	160	260	15,045	17,184
TOTALS	15,600	16,696	1,416,132	1,437,689
II. MAZRA'A AREA (North)				
Ghor Mazra'a	5,351	5,518	460,787	461,623
Ghor Haditha	1,713	1,732	167,422	168,000
Ghor 'Isal*	1,551	1,551	156,791	156,791
Ghor Dhira'a	1,148	1,173	80,732	80,758
TOTALS	9,763	9,974	865,732	867,172
GRAND TOTAL	25,363	26,670	2,281,864	2,304,861

*The Arab Potash Company has bought a major portion of the land in these two areas. Land available for agriculture can thus be expected to be significantly less than indicated above.

Sourch: Agrar-und Hydrotechnik GMBH, National Water Master Plan of Jordan. Report to the Natural Resources Authority, Amman, Jordan, Vol. VII: Socio-Economic Aspects, July, 1977.

Road access to the area is through a winding mountainous road leading to Karak and connecting with the Desert Road connecting Amman and Aqaba. The recently completed Safi-Aqaba road connects the area with Wadi Araba and Aqaba. The road distance from Safi to Amman is about 170 kilometers and to Aqaba about 200 kilometers.

About two-thirds of the total cultivated land in the Southern Ghors (16000 dunums) is used to grow tomatoes, which are the major crop of the area. A dunum yields an average of 1.5-2.0 tons of tomatoes, although this yield can vary appreciably by location, farming practices, and year. The second most important crop is eggplants, which are grown on about 1500 dunums, and which yield an average of about 2.2 tons per dunum. Other major crops include sweet peppers, green beans, broad beans and cucumbers. All crops are grown under irrigation, using wadi base flows which are circulated within the farm in convoluted farrows known as "Dawaleeb". Water is usually allocated to farmers on a weekly basis, usually at no charge. Water is the critical factor in the agricultural development of the area. It is often the determinant of how many dunums are cropped and what the crop yield turns out to be. Nearly all the land is plowed by tractor and weeded by hand. Chemical fertilizers, pesticides and insecticides are in common use. Tomato virus and root-knot nematodes are common and frequently result in major loss of crop. Harvesting is generally done by hand and the crops are marketed in Karak or Amman. The land is used for grazing after the crop is harvested. Animal husbandry, however, remains to be a minor activity. According to the Agricultural Census of 1975, residents of Southern Ghors had about 2000 goats, 600 sheep, 500 cattle and 10,000 chickens. There are also small numbers of camels, horses and asses.

In 1975, there were 549 agricultural holdings in the Southern Ghors, with a total area of 34,832 dunums. Many of these holdings have multiple ownerships, particularly the smaller ones. Farms of 40 dunums or less cover 17.4 percent of the privately owned land, and are held by an average of 6 owners per lot. Forty-seven percent of the land is in holdings of 100 dunums or more, and is owned by 84 persons. The larger farms are generally better-run, more productive, and have a larger percentage of cultivated land, which amounts to only 75 percent of the registered land shown in Table 2. It is thus possible that these 84 owners actually own about 60 percent of all cultivated land. Discussions with local residents indicate that perhaps about 50 percent of the land in the Mazra'a area (north) and 80 percent of the land in the Safi area (south) is owned by a small number of absentee landlords.

Some lands in the Southern Ghors, especially in the Safi area, are in public ownership, and are leased to farmers. Almost all of the lands of Wadi Araba is in public ownership. A moratorium on all land purchase, development and construction activities in the area has been ordered, subsequent to the Decree placing the area under the jurisdiction of the Jordan Valley Authority.

Not unlike other areas of Jordan, the South Ghors and Wadi Araba areas are rich with historic heritage and archaeological sites. These sites cover almost all of the many eras during which these areas have been inhabited: Chalcolithic, Early Bronze, Nabatean, Roman, Byzantine and Islamic. Almost no archaeological work has yet been done in such locations as Bab-al-Dhira'a, Safi, Dhahel, Lisan, Feifa, Gharnadal, and others.

Table 2

SOUTHERN GHORS LAND HOLDINGS

Size Group (Dunum)	Average Size	No. of Owners	No. of Holdings	Total Area	% of Total Land
0 - 10	4.2	1,461	120	511	1.5
10 - 20	13	383	111	1,450	4.1
20 - 30	21	194	110	2,317	6.6
30 - 40	32	134	57	1,831	5.2
40 - 50	42	61	39	1,645	4.7
50 - 100	64	104	54	3,463	9.9
100 - 200	135	34	25	3,382	9.8
200 - 500	317	38	18	5,713	16.4
500 - 1000	640	9	10	6,407	18.4
1000+	1,621	3	5	8,112	23.4
TOTALS	-	2,421	549	34,832*	100.0

*Cultivated land is only about 26,000 dunums, or 75 percent of the officially owned land.

Source: Adapted from Binnie and Partners, et al., Mujib and Southern Ghors Irrigation Project. Report to the Jordan Valley Authority, January 1979, Table VIII.2.

3. THE PEOPLE

The residents of the Southern Ghor and the Wadi Araba areas represent two distinct life-styles and tribal groupings. The tribal make-up of the residents of each of the two subareas within the Ghor and the Araba areas are also distinct. The Southern Ghor is composed of mainly agricultural communities, while the Wadi Araba represents more of a nomadic, pastoral, and bedouin life-style.

According to a census which was conducted on 27 October 1978, the population of the Southern Ghor areas is 11,504 persons, 4738 of whom live in the Mazra'a area (north), while 6766 persons live in the Safi area (south). The census information, which is given in Table 3, also gives a figure of 793 persons in the Wadi Araba areas, with 510 in the south and 283 in the north. These latter numbers are probably underestimates, especially since the agricultural settlement of Feidan does not seem to be included, and since it is almost impossible to include all the roaming bedouins in a census of this type. The people counted in the Wadi Araba area are only those residing in and around the four settlements of Gharandal, Rahma, Bir Madhkour and Gureiga. The actual number of people in the area could be as much as two or three times that reported. The total number of people residing and living in the study area is thus probably about 14,000. It is interesting to note that the population is 54.5 percent male and 45.5 percent female. While there are generally more males than females in Jordan, this imbalance is much higher in the study area. This may be attributed to the presence of single men working as farm laborers and leaving their families elsewhere. It may also be attributed to higher infant mortality rates among females, or perhaps the inability of the census takers to count all the women, due to social and cultural reasons.

The South Ghor population is made up of about twenty (20) different tribes which are indigenous to the area. Their origins are diverse and have been attributed by tribesmen to such locations as Iraq, Gaza, Hebron, Saudi Arabia, Tafila and Egypt. The diversity of origins is clear from the wide variation in the color of their skins; some of the people have a very dark African complexion, although such complexion is not discernable on a tribe-by-tribe basis as a result of intermarriages among the tribes. About half of these tribes are distinctively residents of the Mazra'a (north) area, while the other half are reside in the Safi (south) area. A list of the tribes in each of these areas is given in Table 4. It is estimated that this indigenous population owns less than one third of the presently cultivable land in the area, and that among the large-scale land-owners, only one belongs to these tribes.

Other identifiable groups in the South Ghors are the 'Azazmeh, the Sa'idiyyin, the Hwaitat, the Kurds, and the landlords. The latter group typically does not reside in the area and does not belong to the indigenous tribes. Its members, however, do maintain a residence for occasional use or visits. The 'Azazmeh are a refugee tribe from Beer Sheba, who settled in the South Ghor in 1948. They live and work in the Mazra'a area, particularly in Dhira'a, where 30-40 'Azazmeh families with a total population of about 300, provide more than half of the farm labor in the area. They are

Table 3

POPULATION AND HOUSING IN THE SOUTH GHORS AND WADI ARABA
(As found in the Census Taken on the Evening of 27 October 1978)

Town or Village	No. of Families	No. of Person			No. of Structures[1]	Persons Per Family[2]
		Male	Female	Total		
I. South Ghors						
A. Mazra'a Area (North)						
Mazra'a	344	1,229	1,125	2,354	395	6.8
Haditha	161	875	622	1,497	178	9.3
'Isal	38	136	93	229	44	6.0
Dhira'a	54	504	154	658	67	12.1
B. Safi Area (South)						
Safi	783	3,148	2,945	6,093	910	7.8
Feifa	95	315	292	607	136	6.4
Numeira	12	25	-	25	24	-
Khneizira	2	3	5	8	5	-
Dhahel	2	7	-	7	2	-
Bleida	2	22	4	26	4	-
C. Totals	1,493	6,264	5,240	11,504	1,765	-
II. Wadi Araba						
A. North of Wadi Uhaimer						
Gharandal	26	141	107	248	58	9.6
Gureiga[3]	7	16	8	24	8	-
Bir Madhkour	2	8	3	11	26	-
B. South of Wadi Uhaimer						
Rahma	92	227	223	510	99	5.6
C. Totals	199	442	351	793	191	-
III. Grand Totals	1,692	6,706	5,591	12,297	1,956	7.3

1/All types of shelter, including tents and those used for non-residential purposes.
2/The number of persons per family for very small communities is not calculated, since these communities are often seasonal and limited to farm laborers without their families. It is felt that the availability of such laborers in the area, however, has resulted in a lower than actual average number of persons per household (family).
3/This figure does not seem to include the nearby agricultural cooperative of Feidan, which probably has around 300 persons, all living in tents and under trees.

Table 4

TRIBES OF THE SOUTHERN GHOR AND WADI ARABA

I. SOUTHERN GHOR

A. Mazra'a (North)

Ja'arat	جعارات
Nawaysheh	نوايشه
Dgheimat	دغيمات
Khanazreh	خنازره
'Ijaleen	عجالين
Uwiny	عوني
Nawasrah	نواصره
Atawneh	عطاونه
'Azazmeh	عزازمه

B. Safi (South)

'Ushush	عشوش
Mahafdha	محافظة
Bawwat	بوّات
Khutaba	خطبا
Masha'leh	مشاعله
'Usheibat	عشيبات
Khleifat	خليفات
Mradat	مرادات
Shu'ar	شعار
Ma'agleh	معاقله
Zahran	زهران
Kurds	اكراد

II. WADI ARABA

A. North of Wadi Uhaimer

Sa'idiyyin	سعيدين
'Amarin	عمارين

B. South of Wadi Uhaimer

Lheiwat	لحيوات
Khalaifeh	خلايفة
Gawadhmeh	قواضمة
Khawatrah	خواطرة
Kbeishat	كبيشات

a highly conservative tribe, which has good relations with other tribes, yet maintains its separate identity and does not intermarry with them. The Sa'idiyyin are a tribe which is indigenous to the Northern part of Wadi Araba. Some of them live and work in the south, particularly in Feifa, where some who work in the Wadi Araba also maintain their families and send their children to school. A few Hwaitat families are also found in the Southern Ghor, many of whom spend the summer at Huseiniyyeh, their tribe's headquarters, in the highlands near Ma'an. There are also 16 families of Kurdish origin, who have probably migrated to the Southern Ghors around the turn of the century, and who seem to be a socially isolated minority which has not intermarried with other tribes in the area.

The typical life style of a South Ghor family centers around agriculture, growing mainly tomatoes and other vegetables. Work starts around June of every year when the farmer plows the land, prepares irrigation furrow (Dawaleeb) and plants a nursery. Within 60 days, the farmer is ready to plant his vegetables which will be ready for harvesting in November or December, and which will continue to produce through the end of March. Some farmers also work as laborers in the rainfall fed farms of the highlands in April and May, frequently getting wheat rather than monetary wages. Popular locations are Al-Mazar, Al Rabba, Al-Qasr and Busheina. Most families have a few heads of sheep, goats, cattle or camels. Many families also raise chickens. The tribesmen of the Southern Ghors have a strong association with the land. Very few of them envision a life which is not based on agriculture. Only a small minority works outside the Ghor area or in wage-earning civilian and military jobs. Some of them have worked as unskilled laborers or drivers with the Chinese contractor who built the Safi-Aqaba road.

The population of the Southern Ghors is distributed in five major settlements: Mazra'a, Haditha, and Dhira'a in the north, and Safi and Feifa in the south. The northern settlements belong administratively to the Mazra'a Nahiya, a subdistrict of the Safi District of the Karak Governorate. The southern settlements belong to the Safi District. The towns of Mazra'a and Haditha, with a total population of 3,851, share a village council. Safi (pop 6,093) has a municipal council and Feifa (pop. 607) has a village council. These municipal and village councils are made up of representatives of the different tribes in the area; with each tribe being represented by one or two Mukhtars, depending on its relative size.

The portion of Wadi Araba north of Wadi Uheimar is inhabited by the two tribes of Sa'idiyyin and 'Amarin. These are basically bedouin tribes with main tribal connections in the Ma'an highlands. Many of them have settled into an agricultural or agricultural/pastoral life-style in the Southern Ghors and the North Wadi Araba areas. Similar to the 'Azazmeh, some of them practice dry-farming of wheat and barley in the highlands. Recent feuds between the two tribes seem to have settled down, and they now co-exist largely through the efforts of the Wadi Araba Cooperative Society in which the two tribes have joined hands in an agricultural development of 1600 dunums in Feidan. Thirty-four (34) hired workers and thirty-two (32) share-croppers are presently (1979) involved in this effort. The

cooperative also sponsores a two-vehicle bus transportation system which runs 25-passenger buses between Aqaba and Amman and which also serves a number of intermediate settlements.

The Sa'idiyyin are centered around the new settlement of Gharandal, were about 250 of them live. Until recently they were roaming bedouins, and many of them continue to be so. Until 1975, Gharandal was only a police post and a historic site. In that year, the Housing Corporation helped construct 25 simple two-room concrete block structures in the area, including a school and a clinic. This attracted many of the Bedouins to settle their tents in the surrounding land, and the community of Gharandal developed. The community has no government-recognized village council. A significant number of the residents of the housing units are employed in or retired from the Army. Residents of the town practice dry farming of wheat and barley in Qa'a Al-Sa'idiyyin, a small agricultural basin, 15 kilometers to the north. Many of the Sa'idiyyin, however, continue to pursue a pastoral life-style, moving from one location to another with their herds of sheep and camel.

The Southern part of Wadi Araba centers around the new settlement of Rahma, at the mouth of Wadi Dharba. This location, again, has until recently been the site of only a police station. When in 1974, the Army built a school and the Housing Corporation assisted in the construction of 25 other housing units similar to those in Gharandal, the settlement attracted many more tribesmen who set up their tents in the vicinity. Many of those have left the area during border troubles in the late sixties and early seventies, taking up residence in the highlands, particularly in Queira, about 100 kilometers north of Aqaba, where they maintain tribal connections. Agriculture is non-existent in this area: most people derive their livelihood from working in industrial, transportation, and construction activities in Aqaba. A small number of the residents are in the army, while a few continue to derive or supplement their livelihood from herding.

The settlement of Rahma is inhabited by members of five tribes and a number of army personnel who are stationed in a nearby army camp. The five tribes are the Lhayyat, Gawadmeh, Khalaifeh, Kbeishat and Khawatrah. They are about equally represented in the community. The town is strongly divided, and fierce disagreements, which often break out into fights, exist. The four latter tribes have a coalition against the Lheiwat. They claim that they are the indigenous residents of the area extending from Aqaba in the south to Wadi Uheimar in the north, and that the Lheiwat had migrated into their territory from the Sinai and the Naqab after 1948. The construction of the settlement and the allocation of housing units to all five (rather than the original four) tribes has intensified the dispute and had led to the occasional outbreak of violence. This is probably a particularly sensitive issue, since the ownership of a housing unit and the land upon which it is built, ligitimizes the existence of the intruding tribe in their territory. The coalition of the four tribes continues to fiercely oppose the acceptance of the Lheiwat, and has continuously objected - at all government levels - to any development which is proposed by them. The Lheiwat, however, seem to be the most sophisticated and enterprising tribe in the area, and seem to have garnered stronger government support at both the governorate and national levels.

4. EMPLOYMENT AND THE ECONOMY

The economy of the Southern Ghors is mainly an agricultural economy, while that of the northern Wadi Araba area is an agricultural/herding economy and that of the southern part of the Wadi is a strictly based on herding and employment in the Aqaba area. As a result of low rainfall, some expansion in agricultural activities, the settlement of the Bedouins and the availability of civilian and military employment, herding and pastoral activities have been on the decrease. Employment in Aqaba and the military has in fact become the major source of income for people in the Wadi Araba area. Their incomes are on the order of JD 50-60 per month. Considering an average family size of eight, the per capita annual income would range between JD 75-90 (U.S. $250-300).

There are very few people in the army from the Southern Ghor areas. Among the poorest people in the area are the landless farm laborers who earn an average of JD 1.700 per day on a seasonal basis, or about JD 350 per year. If they support an average family of eight, the per capita annual income would be about JD 45 (U.S. $145.00). Other employed persons who may be working in government or in construction earn an average of JD 75 per month (U.S. $250 per month). It should be noted that almost none of the government employees in the area are members of the indigenous tribes. These employees generally come from the highlands of Karak and the nearby mountain areas. About 100 laborers from the Southern Ghor areas were employed in the construction of the Safi-Aqaba road. The present contractor of the Araba Potash Company residential township is not hiring any locals, but rather is importing all his labor from outside the country. This is causing resentment among the residents, who are looking forward to the industrialization of the area, as a source of employment. Wadi Araba residents who work in the Aqaba area also feel that an unfair competition in the labor market has resulted from the importation of labor from neighboring Syria and Egypt, and that this competition has resulted in the recent lowering or daily wages in that area.

The vast majority of the people in these areas, however, are sharecroppers involved in growing vegetables. It is difficult to estimate their incomes because of vast variations in the yield of the land, and in the practices of financiers and commission agents. The yield of the land varies by location, availability of water, farming practices, plant diseases and the amount and quality of labor inputs. It also can vary appreciably from year to year, depending on the climate. Marketing prices and conditions are also very vulnerable and dependent on government decisions with respect to its western bridge and export policies. These policies determine the extent of market competition, and thus have a direct bearing on the market price. Table 5 shows that the average revenue per dunum in 1975 has varied from JD 39 in 'Isal to JD 136 in Haditha, and that the gross revenue derived from tomato farms has varied from JD 30 in 'Isal to JD 144 in Safi and Haditha. At average farmgate prices of JD 69 per ton, this represents a yield which varies between 0.5 and 2.0 tons per dunum. The average area-wide yield is about 1.7 tons per dunum.

It is estimated, however, that the average annual family income from sharecropping can vary between JD 200 and JD 1000 (U.S. $650-3300), with a large majority of farmers perhaps making around JD 400-500 (U.S. $1300-1650) per year. At an average family size of eight, this would amount to JD 50-62 (U.S. $165-205) per capita per year.

Table 5

1975 REVENUES PER DUNAM
IN DIFFERENT SOUTHERN GHOR AREAS

Area	Average[1] Gross Revenue (JD/Dunum)	Gross Revenue of Tomatoes (JD/Dunum)	Gross Revenue of Eggplants (JD/Dunum)
1. Haditha	136	144	292
2. Mazra'a	75	90	146
3. Dhira'a	67	90	146
4. 'Isal	39	30	177
5. Safi	132	144	177
6. Feifa[2]	51	114	184
7. Khneizira	68	90	146
Overall Average	102	118[3]	171[3]

(1) The weighted average for a particular area.

(2) Relatively large proportions of the land in the Feifa area are used to grow wheat, barley and chickpeas.

(3) At an average farmgate price of JD 69.00 per ton, the tomatoes yield on the average is 1.70 tons per dunum. At an average farmgate price for eggplants of JD 84.00 per ton, the yield is 2.00 ton/dunum. These figures are based on 1973-76 averages.

Source: Adapted from Binnie and Partners, et al., Mujib and Southern Ghors Irrigation Project. Report submitted to the Jordan Valley Authority, January 1979 Tables VII.3, VII.5, and VII.6.

A typical share-cropping family enters into an annual contract with the land-owner. The contract stipulates that the land-owner or his agent will provide the farmer with a subsistence loan or advance of between JD 200-500, which will be repaid with interest, at the end of the cropping season. The interest is usually in the order of 10% for a six to nine month period. The whole operation is either financed by the owner or by a separate investor. The farmer provides all the labor necessary, while the owner or his agent provides plowing machinery, seeds, fertilizers, insecticides, crates, transportation and marketing. For these services the owner or his agent sets the price, and the farmer cannot seek alternative services in the open market. All revenues and costs are split between the farmer and the owner on a 1:2 basis, i.e., the farmer gets one third of the net revenues of the farm, after all expenses, as calculated by the owner or his agent. In cases where the owner is different from the financier-investor, the net revenues are split equally among the owner, financer and farmer. The contract is typically signed with two witnesses and a guarantor. It stipulates that if the subsistence advance is not repaid by the end of the season, the owner will confiscate any other property which the farmer has, unless the farmer renews the contract for another year. Should the farmer default on the provision of labor, the owner will farm the land at the farmer's expense. The farmer will also have to pay for any labor which he may have to hire at harvesting time.

Many farmers do not manage to break-even during the season, and thus continue to be in debt to the owner/financier or the financier. They will have no choice but to continue to work the land at subsistence levels, and to accept whatever terms are dictated upon them.

The share-cropping system described above, has resulted in the exploitation of the farmers by the owners/financiers, who monopolize both the supply and marketing functions of the small farms. Field interviews have indicated that this is indeed the case. Using the information obtained in the field surveys, it was possible to calculate the expected incomes of share-croppers under alternative farm-size and crop-yield assumptions. The mathematical model used, and the cost and revenue assumptions made, are all shown in Figure 4. Table 6 shows the expected net income to the farmer, if he operates farms of 10, 20, 30 and 40 dunums, yielding 0.5, 1.0, 1.5 and 2.0 tons of tomatoes per dunum per season. Two alternative calculations are made, using the present 1:2 net revenue split system. The first assumes that the farmer can purchase his supplies and services under market conditions, while the second assumes the existence of the present monopoly of both supply and marketing by the owner/financier, which jacks up costs and reduces revenues. The assumption is made that under the latter system, the farmer obtains a subsistence advance of JD 400, on which he pays an interest of 10% for the duration of the season.

Table 6 shows the expected farmer incomes under these respective assumptions. It can be concluded that all farms having a size of less than 40 dunums and producing less than one ton per dunum, are incapable of generating a bare-subsistence income of JD 400 (U.S. $1300). Farms of 30 and 40 dunums, producing a yield of 1.5-2 tons/dunum will generate family incomes of between JD 415 and JD 840 (U.S. $1400 and 2900). For a family of eight, this represents a seasonal per capita income of JD 52-105 (U.S. $175-360). In Jordanian

A. The Model:

Net Seasonal Income = 1/3 [R*Y*A - F*A - V*Y*A] - I
= A/3 [Y*(R-V) - A] - I

Where: R = Sales revenues in JD/ton
Y = Crop yield in tons/dunum
A = Farm area in dunums
V = Variables Costs in JD/ton
F = Fixed Costs in JD/dunum
I = Interest paid on subsistence advance.

B. Assumptions*:

	Actual (JD)	Owner/Financier Charges (JD)
1. Sales Revenues per ton	60.000	50.000
2. Fixed Costs per dunum:		
Plowing	1.500	2.000
Seeds	3.000	4.500
Fertilizers	4.000	7.000
Insecticides	1.500	2.500
Total	10.000	16.000
3. Variable Costs per ton:		
Crates	1.500	2.000
Transport	4.500	7.000
Total	6.000	9.000

C. Application:

Under the above assumptions, the following two equations will give the farmers' seasonal incomes in (1) the case when he pays actual costs in the free market, (2) the case where he pays amounts charged to him by the owner/financier.

Net income at Market Conditions $= \frac{A}{3} [54Y - 10] - I$

Net Income at Owner/Financier Charges $= \frac{A}{3} [41Y - 16] - I$

*These data are based on field interviews. A further assumption is made that all the labor which is needed can be provided by members of the share cropper's family, and no further outlays are needed for labor.

Figure 4

FARMERS' INCOME ESTIMATION MODEL

Table 6

EXPECTED INCOME OF SHARE-CROPPERS
UNDER ALTERNATIVE FARM SIZE, MANAGEMENT, AND
CROP YIELD ASSUMPTIONS[1/]

Farm Size in Dunums \ Yield in Tons/Dunums	0.5	1.0	1.5	2.0
10	56[2/] -25	146 43	236 111	326 180
20	113 -15	292 126	472 263	652 400*
30	170 5	438 209	708 415*	978 620*
40	226 20	584 292	944 517*	1304 840*

1/ The calculations for the owner/financier case assume a subsistence advance of JD 400 at 10% interest. The loan, however, will have to be repaid from the net income obtained. Only in the cases designated by an asterisk (*), will the farmer obtain an income which is enough to pay back his loan. In all other cases, he will continue to be in debt, even if he and his family could survive on JD 400 per year. Calculations for the free-market situation assume no subsistence advance.

2/ The top figure in each box is the farmer's income on the basis of actual market costs and revenues. The lower number gives his income on the basis of costs and revenues, as charged by the owner/financier.

standards, even the upper limit of this income is within the poverty level. A previous study has shown that the income of the poorest of the poor in Amman is about JD 600 per year. In the South Ghors, where people do not have to pay rent and where the costs and demands of life are lower, this may be equivalent to about JD 400 per year.

It is doubtless that many farm families attempt to supplement this income by occasional day labor and by working or share-cropping in the highlands during the off-season. Additional incomes and food are also generated by a small amount of domestic animal husbandry. Resulting additional incomes, however, are not expected to be substantial. The reader who is not comfortable with the assumptions made in these calculations can apply the income estimation model with his own cost and revenue assumptions. It is doubtful, however, that significant differences in the conclusions will result.

5. SERVICES AND INFRASTRUCTURE

This section will start by describing the main features of the physical infrastructure in the study area, and then proceed to discuss the availability and utilization of social services. The physical infrastructure includes housing, irrigation, domestic water supply and sanitation, and transportation. Social services include education, health, nutrition, and religious, community and adult education functions.

5.1 The Physical Infrastructure

The settlements of the Southern Ghors are generally widely scattered and ill-defined. The housing units are often dispersed on the farms themselves. Roads are generally unpaved: dusty in the summer and muddy in the winter. The housing units themselves range from brick construction to mud houses, corrugated metal shacks and tents. A one-room corrugated metal shack costs about JD 200 (U.S. $650) to construct. To procure and construct a tent would cost about the same. A two room brick house can be expected to cost about JD 1000 (U.S. $3300). The scarce housing space is often shared with chickens, sheep and goats. Almost all the housing is owner-occupied, with a very small number of units left for rental to out-of-town teachers and other government employees. It is not unusual to find a family of 8 or 10 members living in one room, where the bedding is stacked during the day, to make room for other activities. The housing problems of the Southern Ghors have been exacerbated by the destruction of a number of units, as a result of the Israeli shelling and occupation of the Safi and Feifa areas on at least four occasions during the period between 1968 and 1970. For the duration of these incidents, many of the residents of Safi have temporarily fled their houses and moved north to Mazra's and Haditha. The resulting housing problem has led the government to the development of three housing schemes in the Safi area (south), in order to replace some of the units which have been destroyed, and at the same time, to provide housing for government employees in the area. One such scheme consisted of 100 one-room asbestos housing units which were donated by the Government to the people of Safi in 1972. The quality of the units is very poor, and some of them have since been blown away by the wind. Since the one room is inadequate for the needs of the typically large families, most owners have supplemented it by an extension in the way of a tent or a wooden or corrugated metal add-on. The extension is often used for cooking, which is done either in open wood fires or using kerosene stoves. Furniture in all houses is minimal, and consists of bedding, pillows and possibly a closet for plates, pots and food-supplies. Another housing project in Safi consists of 50 two-room units, which are being sold mostly to government and army personnel, on a lottery basis. They are sold at a cost of JD 1200 (U.S. $4000) on a 20-year mortgage, at a monthly payment of JD 5.000 (U.S. $17). A similar scheme is available in Feifa, where the monthly payments run at JD 3.500 (U.S. $12) per month.

The major settlement in the Southern Ghors is Safi, which is also the seat of the Director of the Safi District, of the Governorate of Karak. This township is actually a conglomerate of five settlements, and is traversed by the Wadi Hasa. The five settlements are the old town of Al-Juwar, the new area of Ramleh, and the three agricultural areas of Umn-al-Hasheem, Al-Naga'a and Al-Samar. In Dhra'a, there are a few houses for the land-owners, but almost all the farmers live in tents.

Many of the constructed housing units, and even some of the tents have outside pit-latrines which are constructed with the assistance and instruction of a government public health inspector. All new housing projects provide for such a facility outside of the main structure. Solid wast disposal is a problem. The wastes are generally thrown away in a variety of locations not very distant from the houses and tents. This results in unsanitary conditions and foul odors.

Irrigation water in the southern Ghors is a problem of major concern to the residents. It availability is extremely vital to both the survival and the livelihood of the farmers. It is generally provided from the base-flow of the wadis or from deep wells which are owned and operated by the major land owners. It is then distributed to the farms through a system of earth canals, and delivered at the rate of 1 minute per dunum per week. The quality of the canals is such that much water is lost to infiltration. The canals are not uniform in size, with the result being that the flow provided by a minute of water varies from location to location. Most of the canals were dug by the farmers themselves, with the exception of one concrete canal which was built together with a diversion weir, by the Potash Company to provide water to the Potash Works on the other side of the border in 1932. There is no charge for the water, but the farmers may collectively share in paying the wages of a guard or canal-rider. There is only one domestic water supply system in the Southern Ghors, which was built with the help of CARE, and to which less than 30 households are connected, in Marzra'a. Most other residents of the area obtain their water by carrying it from the irrigation canals. Needless to say, the quality of the water leaves a lot to be desired. Contamination of these open unlined canals can result from any number of use and misuse practices of both people and livestock. This water situation has resulted in the spread of gastrointestinal and other water-borne diseases, as shown by the village clinic records. Men, women, and children carry the water from the canals to the residences. This is often done late at night, when the residents perceive an improved quality of water. In the residences, the water is stored in uncovered tanks or barrels: a practice which further increases the hazards of contamination. A third type of water distribution system was observed in the housing project at Safi, where a private vendor delivers water in tankers to the houses, and charges JD 0.250 per 240-liter barrel. For a family of 8, consuming 30 liters per capita per day, this will result in a JD 7.500 (US $25) monthly water bill, which is in the order of 10% of the monthly income of the families living in the housing project.

The two settlements of Rahma and Gharandal are basically composed of 25 new structures each. These structures have been built with the help of the Housing Corporation, and are either occupied by retired army personnel, or are distributed among members of the different tribes. Surrounding these two-room brick units are tents in which most of the people live. Many of those owning a housing unit, still maintain a tent and live in it. The tents are shared with chicken, sheep and goats. About 800 people live in these settlements, while the rest of the population leads a nomadic life, roaming the desert with their tents and animals. Each housing unit has its own pit-latrine, while tent residents dispose of their human wastes au naturél. The two settlements obtain their domestic water from tankers provided by the Government. These tankers tour the settlements once or a twice a week, and

fill 240-liter barrels or 1 m^3 galvanized metal tanks which are placed by the residents in front of their houses or tents. This service is free of charge. In the agricultural settlement of Feidan, the residents live in tents or under the trees. None of the areas of the Southern Ghors or the Wadi Araba has an electrical supply system.

5.2 Education

Recent years have witnessed an explosion in school enrollments and the demand for education in the Southern Ghors and Wadi Araba areas. There were no schools in Wadi Araba prior to 1973, when the two schools of Gharandal and Ramah were established. The population in those areas are just beginning to have access to education locally. The number of students enrolled in the Southern Ghor schools has increased by at least ten fold during the last ten years. The first person from the Ghors has graduated from a high school outside the area, in 1967. There are not more than a handful of university graduates among the Southern Ghor tribes. A few others have pursued an agricultural education in high schools and junior colleges in Jordan.

There are presently 12 schools of different levels in the Southern Ghors. Six of those are in the Mazra'a area, while the other six are in the Safi area. There is only one full high school in Safi, offering only the "literary" track of study. A list of these schools, and their enrollments by sex and educational level is given in Table 7. School buildings are generally in very poor condition, frequently of mud or brick construction, with an inadequate number of classrooms. They generally have minimal equipment and support services, such as laboratories, libraries, or athletic facilities. The furniture is generally very old and broken. The classrooms are very small and very crowded, with as many as 6-8 students sometimes sharing the same desk. Students of different grades are usually combined into a single classroom. Schools are often made up of a number of separate rooms, some distance apart. In only three of the twelve schools are the buildings publicly owned. In two schools, the buildings are rented, while the remaining seven schools occupy facilities which are part owned and part rented. One of the major problems of the school systems in the Southern Ghors, is the attraction of qualified teachers to work in the area. Most of the teachers who presently work in the area come from the outside. They face real problems, particularly with respect to housing. They usually live in crowded rooms, perhaps up to 4 or 5 in a room, with minimal furnishings and no amenities. This situation is particularly difficult for women. School facilities do not generally allow for teacher housing. School curricula are not necessarily relevant to a changing agricultural and rural society. The only complete high school in the area, for example has no agricultural or vocational track of study, in spite of the fact that such tracks are available in some high schools in the country.

Total school enrollment is almost 3000 students, two thirds of whom are male and one third are female. Seventy five percent of these students are in the elementary grades (1 through 6). There are again twice as many males as females in these grades. The proportion of female students decreases from 35 percent of all students enrolled in the elementary grades, to 26 percent of those enrolled in the preparatory grades and to 8 percent of those enrolled in the secondary grades. Table 8 provides a comparison between school enrollments in the Southern Ghors and those at the national level, by educationsl level and

Table 7

EDUCATIONAL STATISTICS IN THE SOUTHERN GHORS

Schools	Sex*	No. of Class-rooms & supporting rooms	Grades	Elementary			Preparatory			Secondary		
				Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
'Isal Preparatory	BG	3+1	1-8	30	2	32	13	-	13	-	-	-
Mazra'a Elementary	B	8+1	1-4	233	-	233	-	-	-	-	-	-
Mazra's Preparatory	G	16+3	1-9	-	194	194	-	40	40	-	-	-
Haditha Elementary	G	4+1	1-6	-	100	100	-	-	-	-	-	-
Haditha Preparatory	B	9+1	1-9	186	-	186	41	-	41	-	-	-
Mazra'a Secondary	BG	8+3	5-10	99	-	99	68	-	68	34	6	40
Totals for Mazra'a Area (1046 students)	-	37+8	-	548	296	844	122	40	162	34	6	40
Um-al-Hasheem Elementary	B	7+1	1-6	206	-	206	-	-	-	-	-	-
Um-al-Hasheem Secondary	BG	12+4	1-10	50	237	287	-	61	61	-	9	9
Al-Juwar Preparatory	G	11+2	1-8	130	222	352	-	36	36	-	-	-
Al-Naga'a Preparatory	B	15+2	1-9	297	-	297	118	-	118	-	-	-
Feifa Preparatory	BG	4+2	1-7	92	36	128	5	2	7	-	-	-
Safi Secondary	B	13+4	5-11	136	-	136	143	-	143	125	-	125
Totals for Safi Area (1905 students)	-	62+15	-	911	495	1406	266	99	365	125	9	134
Totals for Southern Ghors (2961 students)	-	99+23	-	1459	801	2260	388	139	527	159	15	174

*. B=Boys, G=Girls, BG=Co-educational schools.

Table 8

NUMBER OF STUDENTS PER 10,000 POPULATION:
NATIONAL AVERAGES AND SOUTHERN GHORS[1/]

Level \ Sex	Male	Female	Total
Elementary	906 1216	783 667	1686 1880
Preparatory	348 323	291 116	639 440
Secondary	225 133	158 13	383 145
TOTAL	1479 1670	1232 800	2710 2470

1/ The top numbers in each box represents the national average, while the lower number represents actual enrollments in the Southern Ghors. National averages are based on a total population for the East Bank of 2,200,000. Ghor averages are based on a population of 12000. This allows for the fact that some residents of northern Wadi Araba send their children to the South Ghor Schools. Only when a national census is undertaken, will it possible to assert that the apparent enrollment differences are not, at least partially, due to an underestimate of the population of the East Bank.

sex. While the total enrollment is about nine percent below the national average, even more significant differences occur at the different stages. It is interesting to note, for example, that elementary school male enrollments are about 35 percent higher than the national average, while female enrollments at that level are about 15 percent below the national average. Almost nineteen percent of the population of the Southern Ghors are in elementary school, compared to a national average of 17 percent. These figures are indeed surprising. One possible explanation, of course, is that the recently conducted census has under-reported the population. It will take an error in excess of 30 percent to adjust for the difference between the local and national percentages of elementary school male enrollments: a highly unlikely proposition in the Ghors, although possible in Wadi Araba. Perhaps some underestimation has occurred, but the fact remains that a unique situation seems to exist. Other explanations include the possibility that the area has significantly higher birth rates and family sizes than the rest of the country, and that a recent awareness of the value of education, coupled with the opening of new elementary schools, has resulted in a rush to school of male children who should have entered school a few years ago. This is a situation which warrants further study if adequate educational planning is to be undertaken. It could also be surmised from these figures that the number of females who are enrolled in elementary school is only 55 percent of that of the males. Twenty three percent of the total male population and 15 percent of the total female population is in elementary school. If 90 percent of all male children are enrolled in elementary school, then not more than 50 percent of the females are so enrolled. This situation, however, may be changing fast, since the number of females enrolled in the first elementary grade is almost equal to the males in that grade, while the number of females in other elementary grades drops off quickly. This is indicative of some rapid social change which is just starting to occur, and which should be further studied and observed.

School enrollments drop off very quickly after the elementary stage, for both males and females, but more drastically so for the latter. Enrollment in preparatory schools is only 27 percent of that in elementary schools for males, and 17 percent for females. The comparable national averages are about 36 percent for both sexes. Secondary school enrollments are 41 percent of preparatory school enrollments for males, and 11 percent for females. The comparable national average are about 65 percent for males and 55 percent for females. These numbers, however, should not be construed as indicative of the drop-out rate only, since they are also at least partially explained by the fact that an increasing proportion of school-age children have been enrolling in schools in recent years. It should also be noted that some students go to secondary schools in Karak or to the agricultural school in Rabbah, and thus that secondary school enrollments are somewhat underestimated by these numbers. The fact remains, however, that school enrollments at all levels, with the exception of the elementary level, are less than their corresponding national averages.

The Wadi Araba area has only two schools: one in Gharandal and one in Rahma. The latter is a modern, fairly large structure, which was built by the army. It has eight grades, and enrolls 63 males and 24 females. All of the females are in the first four grades. There are 22 boys and 10 girls in the 7 grades of the Gharandal school. They are taught by two teachers, in a standard two-room brick housing unit. Students from Rahma who wish to

pursue their education beyond the eighth grade go to school in Aqaba, where a few may share the rental of a room or shack for as much as JD 10 (U.S. $33) per month, or in Queira, where they may reside with relatives.

Among the reasons given for not sending children to school, are the costs of books and supplies, and the difficulty and/or cost of transportation. Among the reasons given for dropping-out from school prior to the completion of the obligatory 9-year cycle, are poverty, early marriage, difficulty of access to school, gainful employment, helping the mother or father, and the lack of appreciation of the parents for the benefits of education. In the absence of any public transportation, students who live in Haditha, for example, have to walk about 9 kilometers to attend preparatory schools in Mazra'a. Students in Feifa find it difficult, if not impossible, to attend schools in Safi. Attitudes toward the education of women vary. While the residents of the Southern Ghors have accepted, and indeed aggressively pursued, the establishment of co-educational classes, even at the secondary levels, this does not seem to be acceptable in Wadi Araba. The Wadi people, who might send their daughters to co-educational schools at age 8, are reluctant to keep them in school beyond the fourth grade. There are indeed no girls enrolled in the Rahma school beyond that grade, although a few people have sent their girls to Aqaba or Queira, in order to attend all-girl schools. The residents also feel that they will continue to cut-short their daughters' education at the fourth grade, unless a female teacher is appointed.

5.3 Health and Social Services

The health care system in the Southern Ghor consists of a central clinic in Safi, and three other clinics in Mazra'a, Haditha and Feifa. The central clinic has 4 primary health workers, while each of the other clinics has one. One physician is in charge of all four clinics, and maintains office hours in them on a rotary basis. Each of the three peripheral clinics is visited by the physician once a week. Medical supplies and pharmaceuticals seem to be in short supply. In cases of emergency or when the need for hospitalization arises, the residents often find themselves obliged to go to the Karak hospital, some fifty kilometers away. Transportation costs are high, when and if transportation can be obtained. A public health inspector is also available. He inspects latrines, water, and garbage disposal practices, and provides the residents with advice on improving these practices. Similar clinics are available in both Gharandal and Rahma. The recent imposition by the Ministry of Health of a JD 0.300 (U.S. $1.00) fee per visit in the Ministry's clinics, seems to have resulted in a reduction in the average number of visits to these clinics.

It is difficult to assess the nutritional situation in these areas in such a short time. There is however, one child feeding center which is provided by a foreign private voluntary organization in Haditha. A similar one in Safi has been recently closed down. Food is also provided to the children by the Army in the Rahma School.

Most villages in the Southern Ghors have a mosque, which is usually a small one-room concrete or mud structure. Neither of the two Wadi Araba villages has a mosque, although a community effort is presently underway to build one in Rahma. Some of the mosques have an Imam appointed to them by the Ministry of Religious Affairs.

Adult education activities seem to be limited to sewing and literacy classes. The former, when available, are run by a local community groups and may obtain some minimal financial assistance from the Ministry of Labor and Social Affairs. The latter seems to depend on the initiative and motivation of the school teacher. Thirty three women have recently completed a sewing course in Haditha, while nine men are currently enrolled in a literacy course in Gharandal. There is general public enthusiasm for these types of activities.

6. NEEDS AND PRIORITIES

In a recent study of Basic Human Needs in Rural Jordan (Dajani and Murdock, 1978), the authors have suggested the following hierarchy of needs.

(a) Basic material needs, including food, nutrition, housing, clothing, water and sanitation.

(b) Health, including both curative and preventive care.

(c) Education, including both knowledge and skills, special and adult education.

(d) Income and economic opportunity, including both employment and income maintenance.

(e) Personal adjustment and social participation, including child-care and family planning, recreation, cultural and religious services, family counselling and support, community organization, and participation in decision-making concerning both the present and the future of the community.

Needless to say these basic needs are inter-related: basic material needs, for example, cannot be maintained unless income generating and employment opportunities are provided. The educational and health systems cannot attract good teachers, physicians and nurses unless a generally habitable environment is available. Improved water and sanitation practices are a pre-requisite to better health, and so on. These five sets of needs however, seem to be as applicable to the Southern Ghors and Wadi Araba areas as they are to other areas of Jordan, although the needs in these southwestern areas of the country might even be more accute. Priorities in the Southern Ghors center around three basic needs: (a) the growth and equitable distribution of resources and incomes, (b) education, and (c) health and the general habitability of the environment. The first priority is evident from the present mal-distribution of land-holdings and incomes, and the generally low income levels. Improvements in this area would allow improvements in the level of availability of most of the basic material needs. It is not a coincidence that one of the main ingredients of this priority is also at the top of the priority lists of all the villagers of Jordan: the provision of water for both irrigation and domestic use. Irrigation water is the heart of the livelihood of these people. Potable water for domestic use is the heart of the third need: that of improving the health and the general habitability of the environment.

The provision of water *per se*, however, is a necessary but not a sufficient condition for improving the situation in these areas. While irrigation water might contribute to the growth of the agricultural economy of the region, it is imperative that land reform and changes in farm management practices be also undertaken, in order to move toward a more equitable distribution of the anticipated growth. By the same token, the benefits of providing potable water are usually not fully obtainable, unless a parallel effort is undertaken to improve housing and sanitary conditions, and to

provide the residents with the necessary health education which will lead to better practices in personal hygiene and to the better utilization of available water supplies.

The need for a healthy and a habitable environment, includes such items as better housing, sanitary and health-care facilities; reasonable access to community services and employment; and the opportunity for social participation and self-improvement. There is no question that all of these are needed high-priority items in the Southern Ghors and the Wadi Araba. It is to be noted, however, that the residents of Wadi Araba place the highest priorities on education and housing. Although they are traditionally nomads, they are very interested in being settled, and have also expressed an interest in agriculture. It is the availability of schools and housing which attracted them to the two settlements of Rahma and Gharandal in the first place. The need for more housing and more teachers, particularly women, is apparent. In order to truly benefit from such improvements, however, more community participation is needed and efforts to resolve tribal disputes in the Southern Wadi Araba must be stepped up.

The high priority which is presently being placed on education is obvious from the school enrollment figures given above. The problems however, seem to center on (a) the lack of adequate physical and support facilities, (b) the lack of a habitable environment for teachers and staff, (c) the irrelevance of the cirricula, (d) the inaccessibility of some of the schools, (e) the inability of the poorest of the poor to afford school expenses, (f) the failure of the schools to perform many other needed community functions and of school teachers to get seriously involved in community and social change, (g) the extremely low retention rate after the elementary stage, and (h) the underparticipation of women in the educational and learning process. This latter problem is a result of many of the above problems. Depending on the location and the tribe, the deprivation of women from the benefits of an education may be based on poverty (i.e. the males have the priority in going to school, in the absence of funds which would allow all the children to enroll), on social and/or religious beliefs and practices, on a lack of perception of the benefits of a seemingly irrelevant education for women, on the need for an older daughter to help her mother with home responsibilities and child care, or on the lack of a readily accessible school in the vicinity. It is to these questions that changes in educational planning must be addressed. Particularly with respect to women and to the very poor, the emphasis in educational planning must be placed on social, physical, and economic accessibility and on curricular relevance. The role of the school as a community center must also be expanded and emphasized.

7. THE FUTURE

The Southern Ghors and the Wadi Araba areas are at the dawn of a new era, which can be expected to result in some major social and economic transformations. After centuries of surviving on a primitive agricultural and nomadic economy, the area faces the prospects of a combination of large-scale industrial activity, a revolution in agricultural practices, and the introduction of agriculture to areas which have hitherto been dry, desolate and barren. It is imperative that the introduction of these changes results in the maximum possible benefits to the indigenous population of the area, and that these changes be adapted, to the extent possible, to the local needs, desires, and social and cultural preferences of these residents. This, however, is not an easy task. While it will not be possible to delve into the details of the possible social impacts of these planned activities on the area in this baseline report, it should be emphasized that the social soundness of each of these undertakings must be considered prior to final system design and implementation.

Perhaps one of the most ambitious plans for the area, is the Arab Potash Company's (APC) Project, which is planned for the Southern shores of the Lisan Penninsula (see Figure 3). The capital cost of the project is about U.S. $300,000,000 and it is expected to produce 1 million metric tons of potash and related products. An employee township is presently under construction at the intersection of highways 80 and 65 (the Karak-Aqaba-Haditha interchange). The APC has stated that it intends to make an effort to give employment priority to South Ghor residents. It will still, however, have to import most, if not all, of its skilled labor from the outside. Managerial and technical staff and their families will be implanted in the area, and will be living in their own enclave of modern residences with all the facilities they need, while their neighbors in Mazra'a and Haditha suffer from the lack of the most basic human and environmental needs. What kinds of relationships will develop between these two communities remains to be seen, and will, to a large extent, depend on efforts by both the APC and the Jordan Valley Authority, during the initial years of the project. The impact of the Potash project will extend to other parts of the area too, as large numbers of trucks carry the products down highway 65 to Aqaba for export. This will also produce employment opportunities for the people of the Southern Ghors and Wadi Araba. Again, unless the long-time residents of the area are helped, both financially and managerially, to capitalize on the small business opportunities which can be expected to arise, an influx of enterpreneurs from outside the area may deprive them from benefitting from these developments.

Another major project which is being anticipated, is the Mujib and Southern Ghors Irrigation Project. This is another ambitious scheme which will increase the area of irrigated land from 26000 to 86000 dunums. If executed, and if coupled with adequate reforms in the land-tenure and farm management systems, and with the introduction of effective alternative institutions for lending, servicing and marketing, it could truly revolutionize the life of the people of the Southern Ghors. According to the calculations shown in Figure 4 and Table 7, even if the present share-cropping system continues to be in effect, and if the yield of the land is

increased through the availability of water, the introduction of drip irrigation, and through agricultural extension services to 5 tons of tomatoes per dunum, farmers' incomes can be expected to grow by 150 percent. Higher incomes will, of course, result if both land-tenure and farm-management improvements are implemented. The gross income of a 40 dunum farm can reasonably be expected to jump from an average of JD 5,000 to JD 12,000 per season. The distribution of these benefits will be highly dependent on the implementation of institutional and legal reforms. Under the present system, the farmer nets a mere 16 percent of the gross revenues. The Jordan Valley Authority also plans to undertake major housing and infrastructure improvements in the area, hopefully gaining from the long experience which it has developed in Northern Ghor (Jordan Valley) Areas.

The availability of ground water from aquifers in the Wadi Araba area, particularly near the settlements of Rahma and Gharandal, suggests the possibility of agricultural settlements, in which the Bedouins have expressed a genuine interest. The experiment of the Feidan agricultural cooperative society demonstrates the potential for such development. It is, of course, important to provide much more infrastructure and services in these settlements than is available at Feidan, where almost nothing is being provided to the laborers and farmers.

Another project which can be expected to have a significant impact on the area, is the extension of highway 65 north to Sweima, where it connects to highway 30 (the Amman-Jerusalem highway). This will reduce the distance from Amman to Aqaba by about 50 kilometers, and make the Southern Ghors more accessible to major markets in Amman and to transportation links to neighboring countries. This highway will also place the Southern Ghors in the mainstream of the Amman-Aqaba tourist and commercial traffic. This is bound to open-up the area, to create job opportunities, and to affect some hitherto unknown changes in the general fabric of this relatively isolated society.

These proposals, together with such other activities as mining in the Wadi Araba, and the restoration of some of the rich historic sites in the area, will undoubtedly have a significant impact on the area. It is impossible to foresee all the direct and indirect, desirable and undesirable, and intended and unintended consequences of these proposals. It does behoove the authorities, however, to try to conjecture about these impacts, to continuously monitor social and economic changes, and to attempt, to the extent possible, to avoid making mistakes which will affect the lives and livelihood of the residents of the area, in ways which would be very difficult, if not impossible, to correct in the future.

8. CONCLUSIONS AND RECOMMENDATIONS

This study represents a preliminary baseline socio-economic survey of the Southern Ghors and Wadi Araba areas. While some of the conclusions which could be derived from this survey were discussed within the context of needs and priorities in Section 6 above, the following paragraphs will summarize the findings and recommendations of the study.

1. People, Employment and Income

a. Conclusion

The indigenous tribes of the Southern Ghors represent the members a number of tribes who are attached to the land, which they farm but generally do not own. Mostly through share-cropping, they derive incomes of between JD 200-1000 (U.S. $650-3300) per year, with an average of perhaps between JD 400-500 (U.S. $1,300-1,650), well within the poverty levels in Jordan. Farming is primitive, water is scarce and share-cropping contracts are often exploiting and unfair. This income is often supplemented by occasional labor or dry farming in the highlands.

b. Recommendation

Perhaps the single most important action that could be taken in the Southern Ghors, is to provide the farmers with a dependable supply of irrigation water, in order to improve the yield of their land and to expand the area of cultivated land. While this action will result in a growth in the economy, the equitable distribution of such growth must be insured through land-reform measures, leading to more land-ownership by small farmers. An effort to improve the lot of the share-cropper through more fair contractual arrangements, and through the establishment of alternative lending, servicing and marketing institutions, must be made. A more active involvement is required of such institutions as the Jordan Cooperative Association, the Agricultural Credit Corporation, the Housing Bank, the Agricultural Marketing Organization and the Jordan Valley Farmers Association, in providing the marketing and support services which are needed by farmers and sharecroppers.

2. Education

a. Conclusion

The educational system suffers from an under-representation of the poorest of the poor and of women. It also suffers from dilapidated facilities and equipment, lack of proper facilities for teachers, inaccessibility, and irrelevance of curricula. Overcrowding is predominant, in an area where the number of elementary school-age children, especially males, seems to be far beyond what can be expected from the overall averages on the East Bank of Jordan.

b. Recommendation

It is of utmost importance that educational planning and improvements, be immediately undertaken. These should include the reconstruction and re-equipment of most of the school facilities in the area. The new facilities

should include residential quarters for teachers. The school should be viewed as a center for community activities, recreation and adult education. The relevance of the curricula to a changing rural agricultural community should be evaluated. An agricultural and vocational track should be established in the curriculum at the Safi Secondary School. Social Workers should seek out female students who are not in school, identify the underlying reasons, and find solutions to their problems. The reasons are expected to be economic (not enough to support both the boys and the girls of the family), social (death of a parent, having to help the mother), physical (the school is too far), cultural, (family will not let the girls walk or ride to a far-away school, or would not let her continue in school, if the classes are co-educational, or they just do not perceive the relevance of the education). School buses, financial subsidies, and school relocation or reapportionment by sex could be considered as some of the possible solutions. The problem of the seemingly high number of elementary school-age children must also be studied, understood and accommodated.

3. Health and Habitability of the Environment

a. Conclusion

Health-care facilities are minimal, and with the exception of a very small number of households, there is no potable water supply system. Many households have no access to sanitary facilities. Waterborne diseases are common, especially among children. Malaria has been eradicated only 15 years ago. Much of the housing is dilapidated and many people live in tents. Almost all the roads are unpaved. There is only one child feeding center in the South Ghor. There is no electricity in either the South Ghors or the Wadi Araba. The residents place a high priority on electrical supply.

b. Recommendation

It is imperative that potable water supply and sanitation improvements assume a high priority in any development effort. It is probably most effective to provide communal standpipes in the villages. A few pilot standpipes should perhaps be constructed, and their performance and social acceptability monitored, prior to launching a major distribution effort. Improved sanitation facilities are also needed. Technical and financial assistance should be provided for the construction of housing units, with their appurtenant sanitary services. The problem of accessibility to health-care and other social services should be studied, and if it is determined that a problem exists, perhaps a combined school/health-care bus service can be established to serve people who suffer from the lack of accessibility to these services. This improvement in accessibility should be accompanied by an increase in both preventative and curative health workers. An effort should be made to plan for the electrification of the area. It may also be worthwhile to experiment with the potential of solar energy in this sun-rich location. Some street grading and improvement will contribute to better access. A physical planning effort should also be undertaken, with a view to a future development pattern which accommodates the socially familiar patterns of interaction between residences, work places and community services and facilities.

4. Monitoring and Planning

a. Conclusion

This is a virgin area, in which little has happened for decades, other than the arrival of the absentee landlord the partial settlement of the Bedouins. Tribal relations are relatively in-tact. The needs are tremendous, and some major decisions and investments will be needed to bring this area into the mainstream of Jordanian life. Many major projects are on their way to the southwest of Jordan. The future impacts of these projects on the social economic, environmental and cultural fabric of the area are presently unknown. Unless a guided and explicit effort is initiated immediately, these impacts will remain unknown, even after they have occurred, and no educated effort will be made to encourage those desirable ones, and to alleviate those which are considered undersirable. It will also not be possible to evaluate the development effort which may be needed, and to provide inputs for further development activities.

b. Recommendation

It is recommended that the Jordan Valley Authority establish a planning and research unit, which will continuously monitor social, economic environmental and cultural change in the Southern Ghors and Wadi Araba. This unit will collect, maintain and analyze both quantitative and qualitative information about the area, and prepare an annual report of its findings. It will also be entrusted with monitoring and evaluating every major undertaking, with respect to its impacts on the socio-economic, environmental and cultural systems of the area, and review and provide inputs into the design of physical social, legislative, economic or management schemes which are to be undertaken by the JVA or any other governmental or major private organization.

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